Digital transformation as expanding strategy and structure

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Abstract

The thesis compares digitalization to industrialization as a technology-driven transformation with new strategies and structures. The theoretical foundation is expressed as first principles: (1) The industrialization as the interplay of strategy and structure with the transformative role of technology, as chronicled by Chandler, (2) the expansion of strategies and structures with new options, and (3) the fractal system theory as the operationalization of Schumpeter’s views on dynamics, leadership and nested levels, such as ecosystem, industry, market and corporation. This theoretical foundation links the digitalization to the rich industrial era epistemology and leads to the initial research question: How does digitalization change strategy and structure – not only in theoretical and general terms, but the practical core concepts and methods? To scope the research question, the thesis has three objectives: (1) To construct a set of frameworks for leading the digital transformation; (2) to apply and test these frameworks for the transformation of the mobile communications industry into the mobile Internet ecosystem, through a retrospective case study; and using the case study as an experiment, (3) to evaluate the case, the frameworks and their theoretical foundation as well as to synthesize the scientific contribution with managerial implications.

The initial research question entails a boundary spanning agenda to fill gaps in the research on digitalization, in theoretical knowledge, especially between classic and new strategies and structures, but also between theory and practice, and digitalization and ICT management. The theoretical foundation is operationalized by triangulated frameworks. The transformation cycle (circle) describes or prescribes decisionmaking paths. The alignment matrix (square) is a portfolio of strategies and structures. The system-theoretical kite strategy map allows to describe issues and movements fractally and holistically. These frameworks link the literature on digitalization to classic corporate, network and industry strategies, structures, systems and planning.

As to the testing of the frameworks, the firsthand information sources are mobile world congresses from 2001 to 2015. The global industry analysis is complemented by zooming in to the Finnish manifold lead market, out to the global ICT industry, and to the then-leading company Nokia. The key observation is the missing Internet insight with classic-biased strategies and structures, leaving emergent business options for adjacents and startups. Scientific contributions are presented as answers to the initial research question and as building blocks for a mid-range theory on digitalization. The theoretical foundation is reframed with a discussion on the "hard" and "soft" elements of digitalization. Managerial implications are discussed including the digital transformation as Internet of Everything during The Roaring 2020s.

Keywords Digital transformation, strategy, structure, mobile Internet ecosystem


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I have witnessed three successive digitalization cycles from the inside in consulting, managerial and entrepreneurial positions: the PC and software business (inflection point 1983), the Internet (1995), and the mobile Internet (2007). Existing office equipment business did not deliver office systems. Existing telecommunication and media industries did not deliver the Internet. Existing mobile industry did not deliver the mobile Internet. Instead, innovations were made by and value migrated to digital startups and adjacents, growing to digital conglomerates, which won the new markets in a big way. This was so fast that the incumbents did not have time to react. During each of these three circa 12-year cycles, from a geopolitical perspective, despite some success stories, Europeans often lost to U.S.-based, in the 2010s increasingly also to Chinese firms.

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Key abbreviations

ADSL Asymmetric Digital Subscriber Line, using ordinary telephone lines for broadband data
AR Augmented Reality
ARPU Average Revenue Per User (usually, in mobile per month, in Internet per year)
B Billion (10^9)
Capex Capital expense
CBI Critical Business Issue
CPS Cyber-Physical System
CRM Customer Relationship Management
CSF Critical Success Factor
CSP Communication Service Provider, a near-synonym for teleoperator, carrier and telco. I use “telco” in historic context and when referring to something where this word was used.
DTMM Digital Transformation Maturity Model (a quantitative model or a checklist)
EA Enterprise Architecture
G2B, G2C, G2E Government To/For Business, Consumer, Employee
GDP Gross Domestic Product
GSK Gearshift Knob (diagram in the methodology)
GSMA GSM Association
I2E Insight into Execution (a qualitative framework)
ICT Information and Communication Technologies
IoE/IoT Internet of Everything/Things
IPTV Television over Internet Protocol
KPI Key Performance Indicator
LBS Location-Based System(s) or Service(s)
M Million (10^6)
M&A Merger(s) and acquisition(s)
M2M Machine To Machine
MVNO Mobile Virtual Network Operator
MWC Mobile World Congress
OMTM One Measure That Matters, the opposite to “vanity metrics” in lean literature
Opex Operating expense
OTT Over The Top, Internet service, expression used in the telecommunication industry
O2O Online To Offline (and back)
PESTE Political Economical Social Technological Environmental (stack)
PMO, PO Program or Project (Management) Office
POTS Plain Old Telephony System or Services, here also Plain Old Television System
ROC Regional Operating Company
SME Small and Medium-sized Enterprise
T Trillion (10^12)
TSCM Talent Supply Chain Management
WAP Wireless Access Protocol
VR Virtual Reality
Wi-Fi Wireless local area network(s)
XaaS X as a Service
Key concepts

Alignment matrix is a square with strategy as the x-axis and structure as the y-axis, the axes described by sliderulers from classic towards expanding new strategies or structures.

(Strategic) attractor is a generalization of the interaction of new strategies and structures, describing dynamics by spins, clockspeeds, basins and coherence. The concept refers to the fractal strange attractor in complexity theory where – by a standard definition – an attractor is a set of values towards which a system tends to evolve, from a variety of starting conditions.

Basin is the measure of the partly invisible and often growing area from which the spins attract resources such as developers, service providers and customers. Basin makes a difference to visible and planned (resource) pool.

Business definition formula is a generalization of Chandler’s propositions on strategy and structure and their interaction, Business = Strategy : Structure, with multiple instantiations, appearances and reductions.

(Map of) business dynamics is an insightful tool to detect and analyze business dynamics.

Coherence is a dynamic match which means right-timing, synchronization and mutual amplification.

Digital Transformation Maturity Model (DTMM) is the model representation – a quantifiable or checklist dashboard – of the transformation cycle.

Fit means a static, planned and managed match.

Generations of insighting come with four stairs: business intelligence, customer and market Intelligence, weak signals and strategic radar, and networked and integrative insighting.

Insight into Execution (I2E) is a qualitative representation of the transformation cycle.

Gearshift Knob diagram (GSK) consists of short and long paths over the Insight into Execution (I2E) cycle, shown as arrows crisscrossing between quadrants.

Kite strategy map is a four-dimensional visual fractal strategizing tool based on system theory. It can also be used for business modeling.

The puzzle of knowns and unknowns is a tool for detecting and analyzing knowledge presence and absence, closely related to strategic or digital radars. It refers to whether the data and the framework are known or unknown.

(New) lean is a (set of) tool(s) for speeding and accelerating insight into execution, for answering the “what” question, discovering “things” and creating and maintaining information-based business models.

(Strategic) slideruler is a tool for combining classic and new strategies or structures. Routes are incremental from classic towards new (value-added services) or outflanking to new, typical by adjacents and startups.

Spins create the fractal and expanding new dynamics in ecosystems. Coherent spins amplify each other.

Stack represents the technology-based structure. Internal stacks such as enterprise architectures have long history for matching technology and business and now external stacks serve new strategies.

T-model is a tool for balancing global (T-hat) and local (T-leg) in strategizing, e.g., local strategy maps on global stacks.

Talent Supply Chain Management (TSCM) is a set of tools for speeding and accelerating the Gearshift Knob diagram from planning to execution at business or corporate levels.

Transformation cycle is a decision and managing circle with qualitative (I2E) and quantifiable (DTMM) versions. The numbered quadrants in the counterclockwise order are (1) insighting, (2) strategizing, (3) planning and managing, and (4) executing.

(Strategic) trident is a tool for attention and resource allocation for and between existing businesses, new businesses, and mergers and acquisitions. The concept makes a difference to single strategic intent.
1 Introduction

The introduction presents the theoretical foundation, the research question and objectives, and discusses the need and relevance of the research, as well as the validity issues together with the applied approaches and principles.

1.1 The theoretical foundation, research question and objectives

The context and case for action for this research is the rapid multi-trillion – in euros and dollars – retrospective value migration in the digitalization$^1$ cycle$^2$ of the mobile Internet.

The theoretical foundation is that of industrialization$^3$ applied, interpreted, augmented and tested for digitalization: (1) Chandler’s history of industrialization and corporation with propositions about strategy, structure and their interaction, and the transformative role of new technology; as its corollary, (2) the separation and mixing of classic and expanding new Internet strategies and structures, with (mis)fits or (in)coherencies; and (3) Schumpeter’s views on dynamics, leadership and nested levels, operationalized here by fractal system theory.

The theoretical foundation means going back to first principles, i.e., starting from very basic propositions$^4$, as such obvious, almost trivial, but what matters here is their methodological interpretation. They also represent a managerial approach compared to the more descriptive macro-level population ecology (Hannan & Freeman 1977, 1984) and evolutionary growth (Nelson & Winter 1982) also used by Doz & Wilson (2018) to explain Nokia’s rise and fall. Surrogate or black-box or variance models are common in digital transformation, correlating measures of digitalization and success in samples, but my research is more about how.

The theoretical foundation links the research of digitalization to the rich epistemology of industrialization and allows to formulate the initial research question: “How does digitalization change strategy and structure – not only in abstract theoretical and general terms, but the practical core concepts and methods?” Change means here conceiving new strategies and structures as expansions to classic ones, and thus linking them together. Practical refers to operationalization with the intent to construct frameworks which could give simple, parsimonious and memorable descriptions and explanations to complex phenomena, to be applicable for management.

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1 Digitization converts analog and physical objects into digital form. It also means “paving the cowpaths” (Hammer & Champy 1993). Digitalization means to use digitization for business or social purposes to make digitization useful (Tilson, Lyttinen & Sørensen 2010). Literally, digital transformation is a broad and deep business or social change. However, these concepts are sometimes used interchangeably in referred literature, e.g., by Venkatraman (2017). I make a difference between digitization and digitalization and use the latter also as an abbreviation for digital transformation and the corresponding long wave also known as techno-economic paradigm (Perez 2002).

2 Dictionaries give multiple contextual definitions for a cycle all of which do not mean a return to the initial state, such as here the digitalization cycle and transformation cycle. In addition, I use cycle also to denote dynamics with repetitive and returning patterns of change.

3 Sometimes, digitalization has been compared to the general purpose technologies (GPT) of electronics or electrification with the letter “E”. The weakness of “E” to explain digitalization was argued by Ford (2015) because of the cognitive capability and broad scope of digitalization. Software may substitute on-site electronic or electric boxes and physical processes, partly or wholly.

4 In the 2010s, first principles have often been described as the philosophical basis of Silicon Valley innovation. Irwin (1988) traced first principles as beliefs, propositions and things back to Aristotle.
The initial research question entails a boundary spanning agenda (Klein & Rowe 2008) to fill gaps in theory, especially in classic and new strategies and structures, between theory and practice, and digitalization and ICT management.

Since the commercial breakthrough of the Internet in the mid-1990s, such a broad research question has been – and will be – discussed and answered in thousands of interviews, articles and books, in different ways, by executives and entrepreneurs, consultants, and researchers of strategic management, information systems, and economics, often separately, as Constantinides, Henfridsson & Parker (2018) argued.

Especially during the 2010s, new strategies and structures with related insighting, strategizing, managing and executing processes have been extensively discussed, conceptualized, theorized and modeled in mainstream academic literature, e.g., in papers published in Information Systems Research, Organization Science, and MIS Quarterly journals. Key concepts include architectures and platforms, and tensional competing and complementing players (Wareham, Fox & Cano Giner 2014) over platforms, with technological and social boundary resources such as Software Development Kits (SDK), Application Programming Interfaces (APIs), app stores, incentives, intellectual property rights, and control points between complementors and platforms (Ghazawneh & Henfridsson 2013; Eaton, Elaluf-Calderwoods, Sørensen & Yoo 2015; Karhu, Gustafsson & Lyytinen 2018). These resources are to “unlock ecosystem advantage” (Williamson & Meyer 2012). Architectures are layered and modular, i.e., *doubly distributed*, firstly because of technology layers and their boundaries, and secondly because of the distributed social control and product knowledge (Yoo, Henfridsson & Lyytinen 2010). Platforms are generative in that they enable external distributed and combinational innovation (Zittrain 2006; Yoo, Boland, Lyytinen & Majchrzak 2012). This had led to new paradoxical challenges (Benner & Tushman 2015) for organizations to combine “loose and tight” – using the expression from Peters & Waterman (1982) –, i.e., generativity and control (Eaton et al. 2015). Organizations need to create customer fit by orchestrating the ecosystem, or by acting as complementors, but also through fast iterative internal development while at the same they need long-term planning and tight management for architectures and platforms.

The theoretical part of my research zooms out and back from the recent constructs and conceives ecosystems, complementors and platforms as the latest phases in expanding strategies and structures, linking what is new to the history and epistemology of corporate, industry and networked strategies and structures. In addition to strategy and structure, system theory as the third key industrial era construct is used to conceive dynamics, fractality and purposefulness. System theory has been proposed or applied also for digitalization (Bauer 2014; Schultze & Whitt 2016; Benner & Tushman 2015; Dattée, Alexy & Autio 2018; Hvistendahl 2018; Wang & Li 2018).

The digital transformation has created huge market valuations for leading firms, increased or decreased revenues – the latter because of lowered prices and increased competition and specialization which have created radical customer value –, and led to powershifts in geopolitics and between regions.

On the other hand, all the above is retrospect and has happened in some specific context – i.e., system environment – during the previous PC, Internet and mobile Internet technology cycles. So it becomes important to clarify and hypothesize the prevailing idiosyncrasies instead of only generalizing and extrapolating the past to the future technology-driven cycles.
In addition, the expansion of strategies and structures has not been a one-way street: digital giants and startups go forward with ecosystems and markets over platforms but may also backtrack to hierarchic pipes, e.g., connected products and systems, and to hybrid multi-channel business portfolios. Tesla has exemplified a vertically integrated business by making its batteries, hardware and software with an always-on connection, even the proprietary artificial intelligence (AI) chip, and charging and selling its cars.\(^5\) Such a business model is different to the networked platforms of the German automotive industry modeled in detail by Radtke, Abele & Zielke (2004). At the same time, both big car companies and startups build mobility ecosystems over platforms. This particular but huge example industry embodies a portfolio of diverse vertical, networked and ecosystem strategies and structures at the same time which should be reflected in the frameworks and tools used to analyze business positions and dynamic patterns. Increased diversity with contradictory simultaneous positions and trends – competing and complementing with various degrees of tensions – were occasionally detected also in the pre-Internet era service:channel portfolio matrix (Mäkelin & Vepsäläinen 1989), e.g., in-house, networked, and self-service strategies.

The initial research question is scoped here into three concrete objectives:

(1) Starting from the theoretical foundation, to **construct** a set of frameworks for leading the digital transformation, with leading focused to insighting and strategizing. For this objective, three frameworks will be constructed; the transformation cycle as circle, the alignment matrix as a square, and the strategy map as a kite. The frameworks are tentative constructs described by textual and visual propositions for which the case study constitutes an experiment. Together, the frameworks embody literally **triangulation**, a common social science approach to combine multiple methods and designs for problem solving (Creswell 1994:174-).

(2) To **apply and test** the set of frameworks for the transformation of the mobile communication industry into the mobile Internet ecosystem, in describing the essential change history and identifying and explaining eras and major moves and turns at industry, market and corporate levels, through a retrospective fractal case study. This case selection is relevant because of value creation and migration in market capitalizations, towards customers and across geographies, and changing revenues. The challenges of the case are in data gathering and research design. To reach this second objective, the analysis of the mobile transformation proceeds in the following way:

− The global mobile industry analysis is mainly based on documented visits to 12 mobile world congresses between 2001 and 2015 together with relevant themes and developments “outside the box”.

− The global mobile industry analysis zooms in to the local Finnish manifold lead market. This analysis is followed by a zoom-out to the coeval global ICT context to explain the then-prevailing management fashion.

− The transformation of the then-leading company Nokia from its pre-Internet intent (1992) to exit (2013/14) is analyzed, concerning its mobile phone business.

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\(^5\) Vertical integration was the go-to-market strategy resembling that of early IBM and Nokia. The New York Times article on Apple’s Titan car project (Nicas, May 23, 2018) pointed to long-lasting but useless partnership negotiations with incumbent car companies. The lesson: do not trust in incumbent partnerships and alliances to help when trying to make something revolutionary.
(3) Using the case study as an experiment, to evaluate the case and the frameworks, and to reframe the theoretical foundation, as well as to synthesize the scientific contribution and to abstract building blocks for a mid-range theory on digital transformation.

The study is concluded with a discussion on managerial implications and on the still unknown next cycle – assumed and named as Internet of Everything during The Roaring Twenties, metaphorically using and timeshifting the industrial transformation of the 1920s for the 2020s.

With the theoretical foundation, its operationalization and the case, the research aims at serving two masters: science and researchers, as well as business communities of executives, managers, entrepreneurs and industrial politicians.

Digitalization has been widely discussed and analyzed in literature with theories, frameworks, models, methodologies and cases. Digital era constructs – such as business models, ecosystems, architectures, platforms and digital intensities or maturities – are not always linked to classic strategies and structures. The classic strategy has not been able address the digital transformation with the evidence from value migration and failed predictions. On the other hand new strategies and structures led to the dotcom crash in 2000, being still a patchwork in a flux and often disconnected from the rich industrial era epistemology. This may create generational gaps between senior management and digital natives.

It is not uncommon to read or hear criticism of being too theoretical (practitioners to academicians about missing tools) or of atheoretical or recycled consultancy tools (academicians to practitioners). To bridge this gap, I want to contribute to the synthesis, simplification, minimalization and operationalization of this literature and to a dialogue between its stakeholders. According to Klein & Rowe (2008), the relevancy problem consists of how to communicate the research and what to research. In the digitalization and information systems domain, researchers with professional life experience are supposed to have a boundary-spanning role by linking theory and practice.

A third gap to bridge is that between digitalization and the methodologies available and used for ICT management. Existing ICT frameworks often target planning and managing of internal structures with projects, operations and governance, for example, by Cobit 5 where “C” now stands for the control of realization, risks and resources, or project/program management offices (PMO), or internal enterprise architectures (EA). The new challenges and the relevance of information systems are less internal than centrifugalized and distributed to external ecosystems over platforms with the paradox of planned control and the generative character of the Internet (Tilson, Lyytinen & Sørensen 2010; Yoo et al. 2012). In addition, there has been a surge of “design”, “lean” and “agile” methods aimed at accelerating customer fit.

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6 Teece (2010) argued that “… while business models have no place in economic theory, they likewise lack an acceptable place in organizational and strategic studies, and in marketing science … the study of business models is an interdisciplinary topic … lacks an intellectual home in the social sciences or business studies”. On the other hand, Nylén & Holmström (2015) described the need for substantial knowledge in assessing digital innovations: “… firms that seek to innovate their product and service offerings with digital technology need managers well-versed in the specific nature of digital technology … Research on technological innovation tends to adopt a macro-level perspective on its object of study, often resulting in high-level descriptions of strategic recommendations.”
1.2 The research motivation and context: the cycles and value in digitalization

Robert Solow (in a New York Times book review, 1987) argued that “you can see the computer age everywhere but in the productivity statistics” and another Nobel laureate Joseph Stiglitz (2014) had essentially a similar thesis, especially criticizing “Internet innovations” for the financial crisis of 2007. This situation has changed rapidly and I vindicate the relevance of my research by explaining digitalization as a cyclic phenomenon with astonishing recent changes in market valuations and revenues, with value migration to customers, and with geopolitical and regional powershifts.

The long wave of digitalization has consisted of five circa 12-year cycles:” mainframes, mini computers, PCs, the Internet, and the mobile Internet (Meeker & DePuy 1996, Morgan Stanley 2009). The three latest inflection points can be dated to years 1983 (more precisely 1981-84; IBM PC, Apple Macintosh and Microsoft, and the software industry), 1995 (1994-96; the Internet and E-Business) and 2007 (iPhone and the mobile Internet). A simple mental arithmetic suggests that the mobile Internet cycle of 2007 might be replaced by a new 12-year Juglar cycle starting in 2019. Essential for the indicators of past value creation and migration – valuations of strategic groups, revenues, customers, geographies – was their acceleration and speed. Essential shifts took a few years instead of decades during previous long waves.

Digitalization has transformed or disrupted media, telecommunication and paper industries. Big industries such as retail, finance, real estate, housing, hospitality, traffic and travel, energy, health and education – there are many classifications –, and Business To Business (B2B) as Industrial Internet, are under assault or scrutiny as potential hits. Literally, Internet of (or for) Everything.

The past multi-trillion value creation and migration in the market capitalization of Information and Communication Technologies (ICT) shown Figure 1-1 illustrates the scale of stakes involved. ICT industry contains five strategic groups (Porter 1980:129-155, Mäkelin & Seppänen 1991, Gallouj 2002:42-69): consumer Internet “I” (blue, monetized mostly by datafication and artificial intelligence), B2B “IT” (green, various evolving product and service financial models), communication services “C” (yellow, monetized by billing), communication technologies “CT” (black, various evolving product and service financial models), and electronics hardware “T” (red, “boxes”, monetized by product sales and as a service such as cloud). Value has migrated (relatively) from “T”, “CT”, “C” and “IT” towards “I”. In 2017, the five most valuable U.S. ICT firms were the top five companies in global market capitalization across all industries, Chinese Tencent and Alibaba were ranked number nine and ten. Together these seven companies constituted 77 % of the top ten in global market capitalization (Meeker 2017:324).

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7 These cycles are as long as the Juglar investment cycles – discovered by Clement Juglar in 1862 – which were described in broader context by Joseph Schumpeter. More detailed versions have been called S-curves by Geoffrey Moore and others.
In discontinuities, markets beat individual firms so that “the golden company” never exists. This means that the competitive advantage is transient, a phenomenon of creative destruction (Foster & Kaplan 2001) associated with the theories of Schumpeter (1942:81-86), and visible in the shortening company lifespans (Foster 2012). The breakthroughs of smartphones and tablets were the fastest technology changes ever. They were upmarket disruptions and their suddenness was seemingly against the early market delay with the bowling alley and the chasm described by Geoffrey Moore (1991, 1995) and Gartner’s hype curve (Fenn & Raskino 2008). This claim is questionable because there had been several early devices in the mid-1990s from, e.g., Apple, IBM and Nokia.

When Chandler (1962) studied industrialization, he observed that new technology companies create new strategies and structures, followed by others with delays. This conclusion is common in managerial literature on digitalization which guides to look at lead industries to imagine the future of one’s own industry. In system theory, this is known as the principle of equifinality where the same final state is reached from different initial conditions and in different ways (von Bertalanffy 1969:40). The PC race in the 1980s deconstructed the ICT value chain into what became known as the horizontal business model. The Internet competition of the 1990s created “new structures and new dynamics” as described in the final

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8 MIT Technology Review, May 9, 2012. Nokia’s former CEO Olli-Pekka Kallasvuo said in a television interview (Finnish TV1, Sept. 7, 2013) that the revolution happened in two years. Meeker (2016:185) calculated that the leading Internet companies of the 2010s have grown much faster than their siblings in the 1990s.
report of a multi-client study (Mäkelin 1998), a phenomenon analyzed by Kogut (2003) and others. Such ideas were commonly presented by consultants and media in the mid-1990s, and practiced by entrepreneurs, but it took some years before they were formulated and summarized by researchers of strategic management, information systems, and economics as platforms which generate distributed and external innovations (e.g., Rochet & Tirole 2003; Zittrain 2006; Eisenmann, Parker & Van Alstyne 2006, 2011; Tilson et al. 2010; Yoo et al. 2010; Yoo et al. 2012; Bauer 2014; Constantines et al. 2018). “The age of the platform” (P Simon 2011) emerged, even claimed as “platform revolution” (Choudary, Van Alstyne & Parker 2016).

**Average Revenue Per User**, known by its acronym ARPU, is a Key Performance Indicator (KPI) in telecommunications, used also in energy and traffic, and it can be extended to retail and health for comparisons. The ARPUs of the three Finnish mobile operators in 2014 were €15 ... €17 per month, down from €40 a decade earlier, a figure that demonstrated the lowest prices in the world, near-free mobile data (Digital Fuel Monitor 2015, Tefficient 2016). This local market is small and peripheral but it has been predictive as a manifold lead market: Internet users 1996 (due to, e.g., early online banking), mobile voice users 1999, mobile broadband users 2009 and price and usage of data 2014 (due to, e.g., flat time-based pricing), and Machine To Machine (M2M) communications 2014 (due to, e.g., electricity and district heat metering).

This mobile connectivity ARPU can be compared to Google’s mostly advertisement-based ARPU (Meeker 2014:14) which is less than one-fourth of the mobile ARPU. Google’s ARPU has doubled in the 2010s while the mobile ARPU has decreased and levelled. Another benchmark is the price of a Facebook click which can reach one dollar or euro (Nanigan 2014). These figures demonstrate the potential of information “I” vis-à-vis connectivity “C” financial models, even if “I” platforms and services are “two times free” (2xfree) for consumers: don’t charge anything, open for everybody.

Popular literature has explained the value migration towards “I” in ICT by “Knowco over Physco” (Tapscott, Ticoll & Lowy 2000), by “Halo” as the digital wrapper around people, places and things (Frank, Roehrig & Pring 2014, 2017), and from other industries towards ICT by “bits eat atoms” and “software eats everything”, sayings attributed to Nicholas Negroponte and Marc Andreessen, respectively. Cost trends explain the inevitability of value migration from hardware and connectivity to datafication, software, and algorithms, in other words, from gatekeeping scarcity to managing abundance, analogously to Moore’s law (Meeker 2014:70-73). Everybody has seen this trend in the declining prices of devices and services. When it comes to “C” in ICT, the Wi-Fi grid with commons-based business model shrinks the ARPU potential, in future, maybe also satellites, drones and balloons.

Baldwin & von Hippel (2011) discussed *customer value* as a paradigm shift and the motive of innovations which come from the disintermediation of producers seeking profits. They challenged “... *the assumption that the profits are the only economically important motive causing innovators to create new designs ...*”. According to Parker & Van Alstyne (2005), a firm can offer free or artificially low-priced products as long as increased demand in a complementary market more than covers the cost of this investment. Isaacson’s (2014) history of digitalization depicted the PC, the Internet and the mobile Internet as primarily consumer-driven – i.e., end-user – revolutions. According to Perez (2002), value starts to migrate to customers after the midway of any – as she called – techno-economic paradigm, also known as the long wave or Kondratiev cycle. When it comes to the Internet, the value
migration to customers was discussed and warned by Porter (2001). Rifkin’s (2014) vision was Zero Marginal Cost Society, generalizing Varian & Shapiro (1998) and Anderson (2006), and extrapolating Internet experiences next to energy and traffic. This consumerization has been called Casual Economy (Schrader 2017) with free Internet services, in other words, deflation whose relevance to jobs and society is a topic in current management and trade literature. Brynjolfsson & Oh (2012) estimated that “... the average incremental welfare gain from the Internet between the years 2007 and 2011 ... corresponds to about 0.74% of annual GDP”. But a service cannot be eternally free, at least for all, it has to be somehow monetized, directly or indirectly, sooner or later. Unlike telecommunication networks, the Internet does not contain pre-planned financial models. The ways of monetization have been and still are key innovation issues.

Digitalization has impacted geopolitics and regions as well. Macro-historic literature has described the bouncing of technology and market leadership between Europe, America and Asia. Ohmae (1982) coined the term Triadian to denote competition between Europe, America and Asia. Historically, this competition has been a slow phenomenon, accelerated as shown by the ”superball” in Figure 1-2.9 Value and leadership migrated from the U.S. to Japan, then to Europe in the 1990s, then fast back to the U.S.10 and to Asia, especially to China in the late 2010s. In the early 1900s, the U.S. was the leader in consumer electronics. In the 1960s, the Americans lost this leadership to the Japanese (Chandler 2001). Europe rose to the top due to the GSM mobility platform. Europeans extrapolated their leadership to the future, but they soon lost their position to Americans and Asians because of the Internet. Key inflection points between the cycles (1983, 1995, 2007) are shown on the time axis in Figure 1-2.

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9 I draw the original version of this bouncing picture during a MWC panel (Feb. 16, 2011) where the rapid change of global of leadership from Europe to U.S. was discussed. This is also a continuation to Chandler’s (2001) analysis of what he called The Electronic Century. This version is updated with the arrow describing the Chinese Internet leadership based on, e.g., Kai-Fu Lee (2018).

10 Meeker (2014) estimated that ”made in USA” share in smartphone operating systems in 2013 was 97 %, up from 5 % in 2005.
The dominance of U.S. and Chinese Internet platform companies vis-à-vis European and Japanese manufacturers and telecommunication network element providers is visible in Figure 1-1. Four Chinese companies Alibaba, Tencent, Baidu and Sohu are in the global top ten of Internet company market valuations or unique monthly visitors (2018) and China is a leader in e-commerce, mobile payments, on-demand traffic services, and Internet of Things research. Next, according to business media, China aims at leveraging the datafication of its society to obtain a lead market position in Artificial Intelligence (AI) applications in the 2020s (Kai-Fu Lee 2018).

The assumed next cycle here named as Internet of Everything can disperse geographical value creation if regions across the globe succeed in their visions to become “new Silicon Valleys”. Urbanization with Smart Cities and regionalization (traffic included) have been topics at mobile world congresses (MWCs) in the 2010s as well as in digitalization literature, even to the detriment of globalization. Despite urbanization, cities may decline, due to the fall of dominant industries or firms, sometimes because of digitalization. Based the “digital scores” survey of Brookings Institution (Muro, Liu, Whiton & Kulkarni 2017), the economy is digitalizing rapidly but unevenly because few metropolitan areas attract the digital workforce.

Assuming incumbent firms are professionally led by best practices, the massive new value creation outside them during the 2010s suggests that there might be something wrong in classic strategies and structures, especially concerning the role of technology. On the other hand, DaSilva & Trkman (2014) pointed to the missing strategies of the Internet business model innovations in the late 1990s. Kuhn (1962/1970:52-53) defined anomalies as

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**Based on MWC Shanghai presentations (2015). The on-demand traffic comment is based on several Seeking Alpha website analyses (2016). The Internet of Things research benchmark is based on Wildbichler, Stelzer, Schiebel & Brecht (2017).**
violations of paradigm-induced expectations which “... demand(s) a more than additive adjustment of theory ... to see the nature in a different way”. He also argued that until the adjusted theory, “... the new fact is not quite a scientific fact at all”. The value migration in the 2010s and the dotcom crash of the year 2000 are anomalies as violations of expectations, addressed by the initial research question to link the paradigms of classic and new strategies and structures.

When it comes to geopolitical and regional bouncing, Internet of Everything as the assumed next cycle (after PC 1983, Internet 1995 and mobile Internet 2007) is an opportunity and threat for Europe and its diverse industries (Bogers, Chesbrough & Moedas 2018). The dispersion of the global leadership during the next cycle is speculation. Based on history, value migration to customers may cut revenues and prices, cause deflation, and increase turbulence in established industries due to a shift from boxes and pipes towards software and the Internet. The Economist (2015) wrote that geeks are not friendly anymore – “... cracking open established industries inevitably results in conflict ...”. In addition to the research papers referred in Chapter 1.1, these challenges have been chronicled and discussed in business media and management literature in Europe (e.g., Cole 2015; Hoffmeister 2015; Schulz 2015; Bouée & Schaible 2015; Schwab 2016; Kollmann & Schmidt 2016; Heinemann, Gehreckens & Wolters 2016; Schallmo, Rusnjak, Anzengruber, Werani & Jünger 2017; Meffert & Meffert 2017; Mayer-Schönberger & Range 2017; Sauberschwartz & Weiss 2018) and in the U.S. (e.g., Thiel & Masters 2014; Ford 2015; Ross 2016; Choudary et al. 2016; Sundararajan 2016; Meeker 2014, 2015, 2016, 2017; Frank, Roehrig & Pring 2014, 2017; Venkatraman 2017).

1.3 The research approach

The set of frameworks constructed here is a cumulative creation from four learning and reframing cycles: (1) the multi-channel service strategy framework (1989-), although this framework was used, tested and crafted in practice years before that) with its generalization to capability strategies (1995-), (2) the kite strategy map (1995-), (3) the Internet (1995-), and (4) the mobile world congresses (2001-2015). The boundary spanning agenda arises from this history to fill gaps in theoretical knowledge especially between classic and new strategies and structures, and between theory and practice by operationalization, and digitalization and ICT management. The research approach is discussed – among other things – in terms of the Requisite Variety of tools, phenomenology and abductive causality.

Literature contains prescriptions for a theory and methodology of strategy. These are curated to a validity checklist with an emphasis for operationalization. Concerning the case study, the validity criteria used in evaluation are credibility, transferability, dependability and confirmability, proposed by Guba & Lincoln.

1.3.1 Lived experience and learning cycles

Schön (1984:165) argued that the positivist epistemology of practice rests on three dichotomies: separating means from ends, research from practice, and knowing from doing. These problem solving dichotomies of Technical Rationality do not hold in Reflection-in-Action when the problem is not given, but unique and unstable. Setting the problem needs continuous reframing, later defined by Normann (2001:4) as “the mental counterpoint of business system reconfiguration”. Circular processes have other roots in muddling through (Lindblom 1959), emergent strategy (Mintzberg 1978) and incrementalism (Quinn 1978). In the 2010s, circular processes have been marketed in blogs and books as normative frameworks and tools for lean and agile business, product, service and software design and development where learning and avoiding waste are crucial (Ries 2011). Osterwalder, Pigneur, Bernada, Smith & Papadokos (2014:188-) summarized the tools for testing, evolving and accelerating customer value propositions in the Internet era.

Because I had no a priori research project plans and goals, this research is based on lived experience instead of action research (Klein & Rowe 2008). However, the three frameworks – the transformation cycle as circle, the alignment matrix as a square, and the strategy map as a kite – and their triangulation were constructed in four conscious and purposeful episodes, here called learning cycles, they did not emerge randomly. Between 1987 and 2002 – before, during and after the breakthrough of the Internet –, I acted as the co-founder and CEO of a consultancy company. The company learning cycle was conceptualized in five steps: (1) Idea generation by reading, discussing and traveling, (2) getting feedback and sharpening the ideas by presentations and writings, (3) organizing multi-client projects to get some initial financing, (4) writing books from these projects for marketing, and – hopefully, based on these four steps – being able to (5) sell and deliver consultancy projects. Because of this, it was essential to operationalize abstract concepts. These steps were plotted on coordinates where the number of customers was the x-axis and the size of the deal was the y-axis. The process went from many small to few bigger assignments. There were subjective decision grids between the steps to evaluate whether an idea was good enough and worth chasing instead of (what is today called) pivoting. A perceived key issue was speed. There was much waste and serendipity in this approach – barking up the wrong tree was risky in terms of opportunity costs.

(1) Multi-channel service strategy was the learning cycle which solved a market need and the conscious search for a customer-oriented approach in consultancy – first as a framework based on transaction cost theory (Mäkelin & Vepsäläinen 1989, Apte & Vepsäläinen 1993, also summarized in Ciborra 1993:94-100), later operationalized to a workbook, and, e.g., to Seppänen’s thesis (1998) which combined service strategies with process management. The key framework was the service : channel portfolio matrix. Transaction cost theory was used to explain that simple services should be automated or delivered as a self-service because of production costs whereas complex services still require knowledgeable people because of transaction costs. It would be too hazardous to automate complex services. From a technological and engineering perspective, my team very well knew that this reasoning was not really true: intelligent and learning systems can deliver complex services even without people. That is why we wrote a detailed 208-page marketing booklet Artificial Intelligence in Business (1986) and succeeded in selling expert system projects to the financial services industry. This line of consulting dried during the AI winter and the recession of the early 1990s, being ahead of its time.
The service strategy framework was later generalized to capability strategy (Mäkelin & Vepsäläinen 1995). The contribution of this learning cycle to my research is the new generalization of the service : channel matrix to what I call the alignment matrix now with strategy and structure as x- and y-axes, i.e., the strategy : structure portfolio matrix.

(2) The search for a broad and practical framework to complement the upper-level and positional service : channel matrix ended in 1995. In a flash, I got the idea to combine the service strategy and the then-actual other consultancy approaches process management and resource-based strategy, together with leadership, into what I started to call the kite strategy map. This was based on system theory so that the generic system was operationalized into a diamond-like shape with four cardinal dimensions. The name kite came from the dynamic and shape-changing nature of the framework, flying in the winds of change, it was not an eternal rigid diamond. Based on Chandler, Ansoff and others, I concretized the system dynamics with the concepts of thrust, move, era and turn, also illustrating temporal, weak and rhythmic causalities. This new kite was able to visualize cross-sectional Critical Business Issues (CBIs), Key Performance Indicators (KPI) and Critical Success Factors (CSF) as dots in the map and the longitudinal dynamics of the transformation as trajectories that connect the dots. The idea culminated in Business Transformation multi-client study in 1995–1996 where one of the cases was the Finnish telecommunication industry, the first version of the case study described here in Chapter 5.2. The main contribution of this second learning cycle to my research is the kite strategy map which was also used as a business model framework in later Internet studies (Mäkelin 1998).

(3) Again, the business and technology environment changed the direction of the work. Mid-1990s were the beginning of the Internet era. Suddenly, customers were less interested of what the company had and we needed to earn money for our living. I felt like we were barking up the wrong tree. The Internet was the “thing” (Schön 1984). Instead of the business transformation, the Internet was an easy sell. The third intensive learning, construction and action cycle consisted of reading articles and books, discussing with customers, travelling in conferences, giving presentations, all this leading to four Internet multi-client projects partly documented in Mäkelin (1998), and to the ability to sell projects. In this process, I started to realize that at least some of the lessons of classic strategy and management were inconveniently obsolete in the emerging Digital Economy. This was a common claim at that time, maybe half-true, but which half? Such a perceived gap between classic and new, or misfit, or incoherence, was not a novel discovery (Chandler 1962). Lots of ideas popped up about the Internet in the mid-1990s, e.g., the business model and the ecosystem. I summarized them as “new strategy means new structures and new dynamics” (1998) and tried to combine the kite strategy map (initially based on classic teachings) with the cornucopia of ideas flowing from the Internet world. This was slow – one reason were the years from 1999 to 2002 when I worked as a manager in a big company, losing direct grassroots contacts with earlier progressive customers and the team I had worked with. I put my drafts to a drawer to wait for a better time. Unlike the kite strategy map in 1995, which emerged as a flash in a creative environment, or the Internet assignments, which were driven by market opportunities, the final methodology took a long time to incubate, including the systematic watching and following the mobile world congresses from 2001 to 2015. The contribution of this third learning cycle to my research is the understanding of digitalization as a phenomenon comparable to industrialization which created then-new strategies and
structures. Now it was the Internet that expanded strategies and structures with new options.

In the late 1990s, many incumbent companies and industries started to compete with the Internet by the digitization of their existing offerings or processes. Examples were digital television and mobile service initiatives intended to “beat the Internet” with control points in billable value chains. In consultancy practice I realized that Nokia was not interested in the Internet even if they used the very word. Later, Tapscott & Williams wrote in Wikinomics that telecommunications and media are at war against the Internet and this “… is also a war against economic development, competitive advantage, and innovation, in short, a war against the future” (2006:273).

(4) As far as there was any single astonishing and triggering observation for this research, it was that – as it seemed back then – Nokia did not get the Internet. This observation was the initial impetus why I started to visit mobile world congresses in 2001: to find out what is this all about and why is it I don’t understand this. And I found out that this was not something Nokia-specific, the global mobile industry was in a state of Internet denial, including Nokia’s peers, competitors and customers. Internet had broken through in the mid-1990s but it was a blind spot for the mobile industry still ten years later. The series of unfolding events impacted my thinking as a showcase of what I started to call missing Internet insight and following classic-biased strategy and structure. Later I understood that the classic strategy was incoherent with the new external structures created by the Internet. The contribution of this fourth learning cycle to my research is the nested case structure: the need to study the mobile business at industry, market and corporate levels, and to include startups, adjacents and established Internet giants, not only traditional competitors.

The boundary spanning agenda to fill gaps – in theory, especially between classic and new strategies and structures, between theory and practice, and digitalization and ICT management – comes from these four learning cycles which extend from the 1980s to the 2010s, i.e., covering the era of change from classic to new strategies and structures, often working on a no man’s land between theory and practice. This is typical to professionally qualified doctoral students (Klein & Rowe 2008).

Parallel and as a common factor to these learning cycles, the consultancy practice obliged to craft a decision and management framework for getting things done, described here by the transformation cycle.

I refer to the learning cycles through published co-authored books (1989, 1991, 1995, 1998) and unpublished mobile world congress reports (2001-2015). Together with academic and management literature, this lived experience when I worked as a consultant, manager and entrepreneur forms the retrospective building blocks for my initial constructs which I – now as a researcher – formulate and test in this thesis. In addition, the selection of the Chandlerian and Schumpeterian theoretical foundation – strategy, structure, and systems – as the first principles emerges out of this history. However, the formulation of the research question aims at the future: what can be learnt for the assumed next 12-year cycle Internet of Everything, possibly from 2019 onwards, not to make predictions, but to insight and strategize in the nascent transformational context.
1.3.2 Key principles applied in the research

The law of Requisite Variety (Ashby 1956:211)\(^{12}\) is interpreted here so that complex dynamic problems cannot be matched and solved with few simple tools. Taleb (2007) used the expression *narrative fallacy* for the tendency and willingness to see simple patterns in things even when there is none, a warning for oversimplification (Klein & Rowe 2008). I apply this law to avoid oversimplification both by the triangulated frameworks and by using multiple tools (indicators, proxies) for further operationalization.

*Phenomenology* studies issues behind what they appear to be and how they are experienced: "... phenomenology may be defined initially as the study of structures of experience, or consciousness. Literally, phenomenology is the study of ‘phenomena’: appearances of things, or things as they appear in our experience, or the ways we experience things, thus the meanings things have in our experience ...” (Stanford Encyclopedia of Philosophy 2013). Phenomenology solves the ostensible conflict between a large variety of tools and the need for theoretical simplicity. The conscious change of perspective is called phenomenological reduction. This principle combines operational complexity with theoretical simplicity.

*Abductive causality* is attributed to pragmatic philosopher Charles S. Peirce (1839-1914). It means that if A implies B, and B is observed, an assumption is made that A exists as well even if there could be other causes for B. This induction-deduction reasoning is common but often tacit in management literature where it is used stealthily. Klein & Rowe (2008:682) argued that abduction as well as deduction are natural strengths of experienced professionals as researchers. I use abduction in testing the frameworks. In addition, based on the global mobile industry discourse in Chapter 4, a “holon” (Checkland 1981) assumes that the industry both missed the Internet insight and followed classic-biased strategy and structure. Checkland used this term for an assumption, idea or a distinction that supports further conversation of possibilities even if it is not yet necessarily agreed on. This “holon” is elaborated by zooming in to the local Finnish lead market, out to coeval ICT industry and to the then-leading company Nokia.

When constructing the frameworks, I do not aim at nomological networks with strong causalities such as A is followed by B is followed by C, such as in root cause analysis. Instead, in all three frameworks, I settle for varying paths, routes and trajectories. E.g., the thrusts, moves, eras and possible turns in the kite strategy map present weaker rhythmic causality patterns in dynamic and systemic context, similar to complexity theory (Benbya & McKelvey 2006).

Creswell (1994:4-7) distinguished *quantitative vis-à-vis qualitative* research paradigms by ontological, epistemological, axiological, rhetorical, and methodological dimensions. On the ontological issue, i.e., what is the nature of reality, quantitative paradigm assumes an objective reality “out there”, whereas in qualitative paradigm multiple and subjective realities are seen by participants of the study. On the epistemological side, i.e., the relationship between researchers and that researched, a quantitative researcher is independent, but a qualitative researcher interacts with that being researched. On the axiological issue, i.e., the

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\(^{12}\) Ashby’s context was biology where the homeostatic system was to resist disturbances and keep its essential variables – Key Performance Indicators (KPI) – inside their proper range. Despite this reactivity, Ashby gave non-biological examples and wrote that the law has an exact relation to Shannon’s Theorem 10 – that “... the noise that can be removed by a correction channel is limited to the amount of information that can be carried by that channel” – giving the law a universal applicability.
role of values, quantitative research is value-free and unbiased, but a qualitative researcher admits the value-laden nature of the study and reports about his or her values and biases. On the rhetorical side, i.e., the language of the research, quantitative research is formal and impersonal, whereas qualitative research can use informal, constructed, evolving and personal language. Finally, on the methodological issue, i.e., what is the research process, quantitative research is deductive and fixes the categories before the study, but qualitative research accepts induction, emerging and mutually shaping concepts and factors. In Creswell’s classification, my research is qualitative although I recognize the need for quantification. The history of strategy shows that – to be relevant – a methodology must have a quantitative instantiation.

I use thematic analysis (Boyatzis 1998) to link observations and the triangulated frameworks constructed from the first principles. This is not a method but a subprocess of qualitative research based on coding as “a way of relating our data to our ideas about these data” (Boyatzis 1998:6, referring to Coffey & Atkinson 1996), i.e., recognizing a moment, seeing it as something followed by interpretation and presentation. Thematic analysis has been and is widely used in a tacit way but the process can also be described and modelled with best practices.

Competences needed for thematic analysis (Boyatzis 1998:7-9, referring to Strauss & Corbin 1990) are pattern recognition with the openness to see these patterns, planning and systems thinking to organize observations in to a usable system which is consistently used, and substantial – in this context often called tacit – knowledge which gives the theoretical sensitivity to recognize what is important, give it a meaning, and conceptualize it. In addition, thematic analysis requires cognitive complexity, i.e., perceiving multiple causalities and multiple variations over time and other variations together with the ability to conceptualize a system of relationships.

Themes can be manifested or latent. In the latter case, they address some underlying aspects of the phenomenon under study. Themes may also need clustering to move to a high level of abstraction. Unit of analysis is the entity on which the interpretation of the study will focus. Unit of coding is the most basic segment, the raw data or information that can be assessed in a meaningful way regarding the phenomenon (Boyatzis 1998:63). Comparing and contemplating the units of analysis vis-à-vis the units of coding helps as evaluate what is left out, what aspects of the phenomenon might not be noted (Boyatzis 1998:65-66).

Tasks of a thematic analysis process include (Boyatzis 1998:9-10) selecting the best focal length, being open to all information, staying consistent but overcoming any rigid projection of a single narrow theory, capturing the essence, and interpreting and presenting the results. According to Boyatzis (1998:31), a good thematic code has a name, a definition, a description of how to know when the theme occurs, a description of any qualifications or exclusions to the identification of the theme, and positive and negative examples.

In my case study, the codebook is what Boyatzis (1998:4) called “a complex model with themes”, i.e., the patterns of information based on the constructed and consistently used triangulated frameworks. This is theory-driven – the theory means now the frameworks I have constructed – thematic analysis and coding, the most common form of the thematic analysis process, used in Chapters 4 and 5 in different ways.

A difference between consultancy and academic research is the approach taken to guidance vis-à-vis observation. Research is often retrospective. There is no possibility whatsoever to effect what happened except by making conclusions and learning. This is the reason Wiener
(1948/1965:162-164) concluded that scientific methods are less successful in studying social systems. Other researchers and consultants have emphasized the continuously improving, perpetually moving open-ended nature of social systems, and firms in particular. They are compared to a river, one can only step in the same river once. For instance, “Big Data” is content with fast correlations and looks less for hard to find and possibly transient causalities, allowing inexactness by “uncertainty principle” (Schönberger & Cukier 2013).

By its very definition consultancy is proactive guidance with "a bias for action", another expression from Peters & Waterman (1982). It means the subject is intervening the object and the goal is to effect the decisions and acts. When research analyzes the past and produces implications and suggestions for the future, consultants are hired to make concrete proposals and development programs, and even to run those. This goes to the extreme – a major problem is if consultancy remains observatory and interventions do not lead into changes, leaving only reports as “stains on paper”. Consultants write normative models, like an engineer’s task is to solve problems instead of observing and explaining them. Retrospective rationalization happens but is less appreciated. Even if I have worked as a consultant, and crafted the preliminary versions of the three frameworks in consultancy settings during the learning cycles, this study has been made in an observatory mode.

Another difference between consulting and research is that researchers make their underlying assumptions explicit to help other researchers. Consultants are more emphasizing practical tools without having time (or money or knowledge) to explicate their assumptions and to link them to what has been previously said. They are expected to give the fast so-what answer. Often they are required to work by the book, to follow their prescription, at least in big firms.

Concerning the multi-disciplinary literature survey in Chapters 2 and 3, more than eclecticism it is the result of the integrative and systemic nature of strategy, structure and transformation. This raises the question of what kind of literature should be accepted as references. Kuhn (1962/1970:13) argued that books "... begin by truncating the scientist’s sense of his discipline’s history and then proceed to supply a substitute for what they have eliminated".

Early management literature was about operations, followed by planning and managing. The third phase was the classic strategy which emerged in the 1970s and 1980s with initially not much practical impact. Chandler (1962) noted that new concepts are slow to take off. Similarly, what I call the new strategy has varied roots. In hindsight, its pivotal years were 1993-1996 when "industry" was declared tired and “complementaries” were seen as crucial for new “lock-on” dynamics with “ecosystem” and “business model” as key concepts.

In this context, it was often challenging to distinguish between academic vis-à-vis management literature, the former tested and validated, but as such often retrospective, the latter more speculative, sometimes guesswork and marketing, and aiming at the future. Like Taylor (1911), a practitioner, or Barnard (1938) and Sloan (1964), both business executives, much of classic and later new strategy was initially created and documented by non-academic people. I have divided references into two groups; firstly, articles and books, and secondly, selection of news and interviews, speeches and panel discussions. In some cases, the classification is not straightforward. Some management books are based on research and/or written by researchers as summaries of their work described earlier in articles. I prefer original articles and when I accept management-oriented articles and books as references and sources I try to avoid fads. Especially in Chapter 3, which is about operationalization, my
research contains a review and synthesis of much of this general management literature patchwork.

U.S. literature and English language dominate the research and managerial discourse on strategies, structures and digitalization. I have consciously studied European literature as well and refer to it when relevant in order to serve research and managerial communities with these links and to give a more global view to “things”. In a modest and tentative way, this links American largely economics-based and European more system-theoretical traditions.

*Template* answers the challenge how to present and write out complex issues and manage the overwhelming material. I follow Chandler (1962) and Thompson (1967) in that sense that key issues are propositions rather than definitions, followed by a summary, discussion and literature describing the background, reasoning and possibly examples, some of those from the case study. The writing style is "what" followed by an explanatory "why". Here, imagery and one-pagers are favored because they have had a formative impact to strategy as an integrative and holistic discipline. The case is described by observations ("show") followed by narratives and framing ("tell").

Another line of thinking emphasizes natural language and “strategic talk” as the only means to communicate and evolve the idiosyncratic and unique character of a business model, as described by Spender (2014). He criticized consultancy tools where ease of use is preferred over analytic power and argued that other than natural language tools are too general for the rent-seeking differentiation that arises from human heterogeneity. I am not following this line of reasoning nor any formal discourse analysis although I use spoken natural language as input in Chapter 4.

**1.3.3 Framework validity with an emphasis on operationalization**

The theoretical foundation is *operationalized* to frameworks in Chapter 2 and later to case-specific managerial indicators and proxies in Chapter 3. Operationalization means and requires both framework-ization and the measurement or observability of abstract or fuzzy things that are not directly measurable or observable, by other phenomena.

The first cornerstone of the theoretical foundation consists of propositions about *strategy* and *structure* and their interaction. Chandler wrote about industrialization and the evolution of the industrial enterprise (1962, 1977, 1990, 2001) and formulated his methods as propositions: "... propositions attempt to provide some sort of conceptual precision ... explain in fairly clear-cut, oversimplified terms ..." (Chandler 1962:8). He chronicled how new technologies changed strategy and structure in the process of transformation during the 19th and 20th centuries. My frameworks are built on the shoulders of this foundation by attempting to describe what happened during and after the turn of the millennium, by proposing and testing a methodology with a case for the early 21st century.

The second cornerstone of the theoretical foundation is the identification and mixing of *classic* and *expanding new* strategies and structures as a corollary to Chandler. Classic strategy emerged in the analog era during the 1970s and 1980s, with *internal* business, corporate and industry structures, and new strategy after the mid-1990s, with *external* structures. Given the complex fields of strategy and structure, this is an utter simplification, but needs to be done because strategy and structure are integrating hypernyms, i.e., umbrella
concepts. Mixing means that the new may not wholly obsolete the old, it is an expansion of options, not a total Kuhnian (1962/1970) paradigm change.

The third cornerstone of the theoretical foundation is the fractal system theory. Warnecke (1993:153-169) defined a fractal organization by self-similarity at multiple levels, self-organization, and vital dynamics, applied by Hoffmeister (2015) for nested digital business models. According to Gloger (2017:190), a fractal enterprise differs from a network so that each element of a fractal is a whole and complete system in itself, aware and knowledgeable of the whole and its role in it. My use of the fractal system concept highlights Schumpeterian purposeful people and leadership, increased dynamics, multiple dimensions and nested levels. The concept of system as such implies holism with a degree of internal fit, and the systems of systems are called complexes.

What theory is and what theory is not (Sutton & Staw 1995, DiMaggio 1995, Weick 1995)? The strengths and weaknesses, the process character and groundedness of management and other social science theories have been discussed broadly in literature. Due to my lived experience, the emphasis in this research is in operationalization. The failures of the early theories of strategy to arouse interest have been explained by the lack of repeatable methods (Rumelt, Schendel & Teece 1994, Kiechel 2010, Spender 2014, Kotter 2014). These needs are addressed by the operationalization of the theory to frameworks as methodological constructs and further to indicators and proxies – also called tools – which are used to represent the frameworks.

General requirements for a strategic methodology are holism, ability to address both longitudinal and cross-sectional problems, and practicality (own listing, based on literature):

- Holistic is the opposite to single idea push. Porter (1987) warned: "Early techniques each posited a single variable in competition ... There is a dangerous tendency today to practice single-issue management ... The truth, of course, is that there is no easy answer ... The most effective companies manage to integrate and make consistent all these aspects of management." He was worried about fads and emphasized the integrative role of strategy. The methodology must be on a high level of abstraction, its components must originate from broad areas. It should not be eclectic (in the pejorative meaning of this word) but systemic.

- The methodology must cope with longitudinal/dynamic (typical for cases) and cross-sectional/static-structural (typical for large samples) problems. It must be able to combine historic ex post and cross-sectional analyses and aim at effecting decisions ex ante. This requires multiple dimensions of change and a rich suite of dynamics.

- The methodology must be operationalized with tools such as checklists and measures. It must be a flexible, more a guide than a prescription. Practicality requires simple words, symbols, and one-pagers.

To further concretize these requirements, now explicitly based on Porter (1994), Hamel & Heene (1994), Schön (1994) and Kay (1995, 1996), a curated validity checklist consists of the following fourteen issues.

According to Porter (1994:427-431), there are four fundamental issues in the building of theories of strategy: Should one aim at building a model or a framework? What is the appropriate length of the causal chain? What is the time horizon? How to operationalize the theory and to test it empirically?

(1) Should the theory builder aim at rigorous models or more general frameworks? Porter wrote that due to the myriad of the variables and the complexity of their interactions, as well
as the goal of informing practice, the strategy research has favored building frameworks instead of creating models. Frameworks identify the relevant variables and the questions that the user must answer in order to develop tailored conclusions. And, Porter concluded, as long as the building of frameworks is based on in-depth empirical research, it has the potential not only to inform practice but to spur the development of more rigorous theory.

I could aim at conceptual purity and minimalism by a unified framework, each concept carefully defined, by using references selectively; to keep things clear stay within one paradigm. However, this approach leads to the need to explain former frameworks with novel words, to rename familiar concepts causing perceptual problems in informing practice and in empirical testing. The second alternative is more interdisciplinary; going through what others have said, aiming at building an upper-level framework on existing foundations. This approach may lead to conceptual ambiguity and plenty, but on the other hand makes connections between familiar, well-thought and tested ideas. Firms and industries have their own familiar vocabulary and language, rooted in their history, and they do not change those without good reasons.

(2) Porter’s second fundamental issue is where to focus in the chain of causality. How long should one proceed in the series of asking why? A theory that aims at early in the causal chain may be intractable. Conversely, a theory oriented later in the chain may be too limiting and miss possibilities. This issue can also be expressed as locating the boundary between endogenous and exogenous variables. This was discussed by Fransman (1995) in his analysis of Japan’s computer and communication industry (1995:453): "... from the point of view aggregate economic performance, it is the industry rather than the individual firm that matters. While the individual firm may expand, contract, or even die, it is the performance and growth of the industry as a whole that is of economic significance. However, an industry comprises a population of firms, and an industry’s dynamics depends large on the interactions between its firms. At times, firms in other industries influence the dynamics of particular industry. In order to explain the performance and growth of a population of firms, therefore, it is necessary to have theory of the individual firm." His example was NTT (1995:352): "NTT has been much more than just another company in this industry: it has been a 'mother' company, giving birth to and nurturing some of the leading companies in this industry."

In my case study the retrospective causality is handled at industry, market and corporate levels, and globally and locally. The case shows how classic industry and corporate strategies and structures surrendered to newer ecosystems over external platforms.

(3) Porter’s third challenge is the time horizon, closely related to the second fundamental issue. Should one focus on two or three years, or explain success over decades or even over a century, as done by Chandler (1962, 1977, 1990, 2001), Schumpeter (1912/1934, 1939/1964, 1942), Collins & Porras (1994) and Collins (2001). The retrospective global industry case covers the years 2001-2015, but I refer multiple times to the Internet boom of the 1990s and to the multi-channel service strategy framework of the 1980s.

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13 “The very word ‘model’ ... creates great confusion” (Kay 1996:14). The discussion frameworks versus models here refers to the degree of formalism, not the descriptive vs. prescriptive dimension.

14 It is challenging to explain the issues encountered in practice with one vocabulary only because of phenomenology and what Spender (2014) called incommensurability. One solution to this dilemma is an open framework which acts as a bus for plugging in specific methods.
Both causality and time issues deal with the boundaries of the effort. Porter wrote that too narrow boundaries may lead to precise speculations about the nature of the relationships inside the domain of the study, but to false conclusions by excluding other potentially powerful phenomena and relationships. He continued that on the other hand, including more concepts and relationships leads to complexity that frustrates theory building in efforts to spur causality and relationships between phenomena.

(4) The fourth fundamental issue is how to test theories of strategy empirically. Rumelt (1974/1986) wrote that he started the use of large-sample statistical methods for studying business strategy and utilizing economic language and logics of economics. Before that business strategy was based on cases and was largely atheoretical. Porter argued that rigorous statistical testing of frameworks is difficult but favored by academic journals. Kotha & Vadlami (1995) revealed that managers did not easily identify abstract strategies. They must be inferred from concrete actions to make them visible. One may not simply go and ask whether a company has, e.g., a differentiation strategy. Thiel & Masters (2014) even wrote that firms who have it like to say they don’t have it, highlighting competition, and vice versa those who don’t have it like to deny their lack of differentiation. A great deal of work must be devoted to find out and define the real-life content of abstract concepts. Consequently, the nature of the strategy requires in-depth case studies. Together the long horizon and the case method make the strategy analyst behave and look like a historian (Porter 1994:461). The main problem in the case method is that it is expensive and slow. The access to information is also a challenge.

If a concept or framework is known and familiar, a questionnaire- or interview-based testing is possible. If a concept or framework is less known, a great amount of work must be put to the description, communicating and selling the concept or framework itself. If strategies are emergent or stealth, more tacit than explicit, they may not be easy to identify. Just saying something – such as “we have an Internet or E-Business strategy” – does not necessarily mean it. The strategy must be inferred like an archeologist is trying to construct an ancient thing from scattered pieces. Leopold von Ranke (1795-1886), the founder of modern source-based history, emphasized primary sources, narratives and outsighting (Aussenpolitik).

A large part of strategy literature is about operationalization. Hamel & Heene (1994:2) concluded that (5) “…if there is a shortage of anything in the strategy field, it is not of well-tested theory but of administratively sophisticated, contingency-sensitive and operationally subtle theory.” Hamel & Heene (1994:315-320) also suggested that any new theory of strategic management should contain four elements:

(6) A dynamic view of the sustainability, meaning that it should describe the processes that maintain corporate renewal.

(7) Resolving the dilemmas in conflicting competitive advantage such as cost and differentiation. The framework should contain detailed procedures for determining customer value beyond simple generic strategies, as well as links between value and capabilities.

(8) Integrating the learning organization metaphor into strategic management, that is, to present rich dynamics and to notify emergent actions and operational management.

(9) A theory for corporate strategy, building around strategic architecture, or combining and recombining traditionally scattered resources for building core competencies.

These elements are about integration and holism, opposing fragmentation that may lead to abductive single-issue reasoning. Schön (1994) set three additional criteria (for a business
book but conceived here for any method): (10) relative truthness, (11) practical usefulness, and (12) managerial appeal. Frameworks need to be memorable, intuitive and flexible for communicating and framing complex issues, and for collaboration across people from diverse backgrounds. People should understand them in seconds and remember forever. A natural user interface means people can utilize frameworks without training, manuals or somebody telling how, i.e., casually.

Kay’s (1995) guidance about (13) minimalism was: “A good organizing framework is minimalistic – it is simple as is consistent with illuminating the issues under discussion – and it is memorable. The organizing framework provides the link from judgment through experience to learning. A valid framework is one which focuses sharply on what the skilled manager, at least, distinctively, already knows.”

With minimalism comes the trap of oversimplification. Klein & Rowe (2008:681), when discussing the research relevancy problem, concluded that, instead of imaging and oversimplifying, “... experienced professionals tend to have an appreciation for the complexity and dynamics (of the problem)”. Balancing between minimalism and oversimplification is like tightrope walking – for instance, 2x2 matrices are minimal but are they oversimplified?

Finally, (14) etymology studies how the meanings of words have changed over time. In my context, this means linking new and classic vocabularies. As strategy and structure are integrating hypernyms, they must both integrate themselves on a time continuum.

I use this 14-point checklist instead of Rumelt’s (1979) more planning-oriented strategic theory test which set four criteria: (1) consistency (avoid inconsistent goals and policies), (2) consonance (represent an adaptive response to the environment and to the critical changes occurring within it), (3) advantage (provide for a creation and/or maintenance of a competitive advantage), and (4) feasibility (neither overtax available resources nor create unsolvable subproblems).

1.3.4 Case study validity

According to Lincoln & Guba (1985) and Guba & Lincoln (1994), the validity requirements are credibility, transferability, dependability and confirmability. Credibility corresponds internal validity and asks whether the results of the research are believable and match the reality. Lincoln & Guba (1985) viewed the credibility also from the perspective of the participants in the research. Transferability is analogous to external validity and asks whether the results can be generalized and transferred to other contexts and settings. To address this criterion, Shenton (2004) recommended contextualization. Dependability is closely related to credibility and asks how the research depends on the specific context and what are these factors. This criterion can be handled by, e.g., overlapping methods and detailed methodological descriptions (Shenton 2004). Confirmability corresponds to objectivity and asks whether the results can be confirmed or corroborated by others, e.g., could somebody else have done the research and is there anything that contradicts the results. According to Shenton (2004), triangulation may be used to reduce the investigator bias.

There are obvious overlaps between the case study validity and the requirements for a theory of strategy. The criteria of credibility, transferability, dependability and confirmability depend heavily on the available transparent and repeatable, operationalized methodology.
Often case studies are made from history, describing series of events which occurred years or decades ago. For example, when the MIT study (Womack, Jones & Roos 1990) analyzed the Japanese automotive industry, they had to go back to events 20, 30 and 40 years earlier. My case study tracks and analyzes the transformation of the mobile communication industry to the mobile Internet ecosystem at multiple levels because there is no single right level of analysis. These levels (global mobile industry, local market, global ICT industry, Nokia) have slightly different time spans because their own logics, i.e., the timing of thrusts, moves, eras and possible turns. And when I documented the global mobile industry, I did it in real-time, describing the emergence and unfolding of events. The italicized text of the case in Chapter 4 are directly picked from my mobile world congress (MWC) reports written *in situ* and *gemba* between 2001 and 2015 although the interpretation I give to the data here is partly retrospective rationalization.

The case study is a hybrid in the sense that different data gathering and analysis methods are used at global industry vis-à-vis local market and corporate levels. The global mobile industry as a case study object was neither a singular organization nor a company. There was a large number of incidents not in any specific chronological order. I summarized this fragmented congress discourse together with simultaneous out-of-the-box events and trends into a few themes – von Ranke’s narrative and outsighting –, and tried to detect possible changes in these themes in time. I followed selected principles of constructivism and discourse analysis although not these methods as such. The result was the mobile industry narrative with themes, distinct eras and diagrams to be complemented and tested in local market and corporate studies.

In contrast, concerning the Finnish market and Nokia, specific key events at singular corporate level were easy to spot and log, both in time and retrospectively. These events were also easy to cluster, number and describe by diagrams. Unlike the mobile world congress documentation, which largely relies on my notes, archived secondhand material on corporate level is abundant.

As to the global ICT industry, the short analysis leans on my Strategic Realignment multi-client study in 2001-2002 together with a literature review to show the management fashion after the dotcom crash.

### 1.4 The structure and reasoning in the thesis

This introductory Chapter 1 is about the context and relevance, the theoretical foundation, the research question and concrete objectives, the validity issues, the research approach and its key principles.

Chapter 2 constructs the frameworks from the theoretical foundation: the transformation cycle; the alignment matrix separating, combining and matching classic and new strategies and structures; and the fractal system-theoretical kite strategy map or business model to highlight purposefulness with leadership and dynamics.

Chapter 3 operationalizes the transformation cycle and discusses insighting, strategizing, planning and managing, and executing. All this has been a cornucopia of fragmented literature for decades. My challenge to distill what is essential for the strategy- and structure-

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15 Gemba is “the place of truth”, “the real place”, “ba” where things happen, in Japanese management systems. This time it was the mobile world congress.
focused research question and to avoid the unnecessary representation of what is well-known, or irrelevant, to keep the whole manageable and readable, in the expanding universe of tools. Especially challenging is the operationalization of the emerging new and external structures.

The frameworks are tested in Chapters 4 and 5. Chapter 4 is the retrospective analysis of the global mobile industry transformation. Chapter 5 zooms in to the local Finnish manifold lead market, then out to the coeval ICT industry, and to Nokia as the then-leading company, filling the gaps in and searching confirmation and explanation for the global industry-level observations, including the “holon” of classic-biased strategy and structure.

Chapter 6 summarizes the results. The frameworks and the case are evaluated. Scientific contributions are presented first as the answer to the initial research question and then by abstracted building blocks for a mid-range theory on digital transformation from the case. Managerial implications are also discussed including Internet of Everything during The Roaring Twenties. Chapter 7 is a short conclusion.

Figure 1-3 summarizes the conceptual structure and the flow of the thesis.

![Figure 1-3 The conceptual structure and the flow of the thesis.](image-url)
2 The initial methodological construct

Based on the theoretical foundation as the first principles, strategy, structure and system are hypernyms, i.e., umbrella concepts of the research. The initial methodological construct uses them for three frameworks which are the transformation cycle (visualized by a circle), the alignment matrix (a square) with auxiliary constructs, and the system-theoretical kite as a strategy map or a business model. Next, they are presented as propositions followed by a discussion and literature.

2.1 Strategy and structure as hypernyms

Applying and expanding Chandler, strategy and structure are defined as hypernyms with multiple phenomenological and contextual instantiations as concrete and practical concepts, methods and tools. Strategy creates value, structure incurs costs. The relation and interaction of strategy and structure is expressed by formula Business = Strategy : Structure = Value : Cost. This formula is the basis for both the transformation cycle (circle) and the alignment matrix (square).

This minimalistic formula then becomes a “general theory of business relativity” where common instantiations, appearances or reductions are Portfolio : Architecture (in classic and internal contexts), Business or commercial model : Operating model (in new and internal contexts), and Ecosystem : Platform (in new and external contexts).

Chandler (1962:13-14, 42, 383) wrote that different organizational forms result from different types of growth. This meant that “structure follows strategy” because planning and carrying out the growth is strategy and the organization devised to administer the enlarged activities and resources is structure. Chandler defined structure internally – “... the design of organization through which the enterprise in administered ...” – but he had multiple broad interpretations for it. Strategy meant expansion of volume, geographical dispersion, vertical integration and diversification (Chandler 1962:14, 42). E.g., the Internet multi-client final report (Mäkelin 1998:88) concluded that Internet conglomerates seemed to follow Chandler’s growth strategies: increased volume, new markets, new activities and new products. Structure knitted together the total resources of the enterprise: "... financial capital; physical equipment, such as plants, machinery, offices, warehouses, and other marketing and purchasing facilities, sources of new materials, research and engineering laboratories; and, most important of all, the technical, marketing, and administrative skills of its personnel" (1962:14). In other words, structure is "... the design for integrating the enterprise’s existing resources to current demand; strategy has been the plan for the allocation of resources to anticipated demand" (1962:383). Chandler noted the importance of intangibles: "... of ... resources, trained personnel with manufacturing, marketing, engineering, scientific, and managerial skills often became even more valuable than warehouses, plants, offices, and other physical facilities" (1962:383).

Thompson (1967:51) had an internal definition for structure: "... internal differentiation of patterning or relationships ... pooled, sequential and reciprocal dependencies”.

Strategy : structure frameworks as matrices with different vocabularies have been presented by, e.g., Woodward (1956/1965); Hayes & Wheelwright (1984); Mäkelin & Vepsäläinen (1989, 1995); Apte & Vepsäläinen (1993); Ciborra (1993); Fjeldstad & Stabell
A commonly used variation is the magic quadrant matrix by Gartner Group with terminological differences such that strategy is substituted by vision and structure by execution.

*Portfolio and (enterprise) architecture* are instantiations to strategy and structure in internal corporate context. In newer strategy vocabulary, the numerator is the *business or commercial model* and the denominator is the *operating model* of a single company.

I familiarized with the *business model* concept in the mid-1990s before its fragmentation. To summarize literature studies (Al-Debei & Avison 2010; Zott, Amit & Massa 2011) and syntheses (Amit & Zott 2001; Osterwalder; Schindehutte & Allen 2005; Johnson 2010; Zott & Amin 2011; DaSilva & Trkman 2014; Wirtz 2016), the business model can be conceived as a system, linking strategy, structure and processes, which creates the possibility to use the rich system-theoretical epistemology.

It has been argued that digital innovation requires a new systematization and the business model is supposed to be better than, e.g., the value chain for this purpose (Stüber, Hudetz & Becker 2017:220). Wirtz (2016:24) classified the theoretical foundations of business models into three categories: IT (information technology), structure (organization) and strategy (business integration). He concluded that literature focuses either on types or components of business models. By modeling the business with multiple resolutions he tacitly leans on system-theoretical predecessors, not mathematically as the early business simulation models since the 1950s, but by visual frameworks. Confusingly, these process representations are called execution-oriented operational or process models (denominators) as complements to business models (numerators). This confusion was highlighted by DaSilva & Trkman (2014) who concluded that the business model is theoretically rooted in the resource-based view and transaction-cost economics, “... as a combination of resources which through transactions generate value for the company and its customers”. Both Wirtz (2016) and DaSilva & Trkman (2014) are close to my system-theoretical conceptualization of the strategy map and the business model.

Business models can be conceived as functional or managerial (Wirtz 2016; Werani, Schaubberger, Martinek-Kuchinka & Freieisen 2017). In the latter case, instead of, e.g., channels and relationships as business model components, the focus is on the management of channels and relationships.

The fragmentation of the business model concept has not prevented its wide use in colloquial language, in a broad sense, as the synonym for business definition, or as a communication tool such as "a simple representation of a company's value drivers for stakeholders and especially to the capital markets” (Eccles et al. 2001), or in a narrow sense, as the *financial model* such as the monetization algorithms in mobile data, apps and ads, or with an operational process focus. Multiple meanings are not drawbacks as long as they make the concept useful and the definition in use is contextually clear.

The financial model is the interpretation of the business model in economics (Rochet & Tirole 2003). The missing built-in monetization of the Internet was a call for innovation. Most consumer services are financed by B2B income, substituting money with data and Artificial Intelligence (AI) for targeted advertisement. Media has struggled with consumer unwillingness to pay for content. DaSilva & Trkman (2014) made a difference between the single holistic business revenue model and the multiple specific mathematical economic models used in business. Innovative pricing was highlighted by Eisenmann et al. (2006).
Kaplan & Norton (1996) defined finances as the fourth perspective in their balanced scorecard but Osterwalder & Pigneur (2010) and Hoffmeister (2015) separated business and financial models. The business model formulations in Schallmo et al. (2017) included financial models. McGrath and Macmillan (2000) explained that every industry has some simple financial model, such as seat utilization in airplanes or restaurants, bed utilization in hotels, or sales per square meter in retail. In the late 1990s, it was thought that clicks substitute the century-old connectivity time as the telco Key Performance Indicator (KPI). For a short time, Sonera’s – the Finnish leading teleoperator used as a case in Chapter 5 – slogan was Making Things Click (1998), a continuation and a new form of the industry legacy “meter and bill” financial model. In banking, micropayments have been so far successful in collecting money from transactions whose profitability has attracted fintechs (i.e., startups) and techfins (i.e., Internet conglomerates). In general, things were made to click but the B2B financial models of media – advertisement monetization algorithms – have substituted the financial models of telecommunication and banking industries.

When it comes to business model classifications, there are, e.g., four (Venkatraman 2017, Hoffmeister 2015), six (Croll & Yoskovitz 2013), eight (Weill & Vitale 2001) or fourteen (Werani et al. 2017) of them. The business models in-use are evolving (DaSilva & Trkman 2014), fractals (Hoffmeister 2015), or molecular and atomic (Weill & Vitale 2001), and likely many of those have not yet been discovered.

DaSilva & Trkman (2014) saw two differences between a strategy as dynamic capabilities and a business model: firstly, dynamic capabilities respond to contingencies through the business model which is bounded by these capabilities, and secondly, the strategy is about the future whereas the business model describes what the company really is at a given time.

In this thesis, business models and strategies are conceived as near-synonyms so that their difference is in the way and purpose the concepts are used. A strategy focuses selectively on competitive differences and future, it does not describe every “thing”, but unlike in DaSilva & Trkman (2014), it is not necessarily bounded by dynamic capabilities, i.e., being additive and close to core, instead, it can be based on radical and outflanking customer value. In addition to the Internet, an example is plug-in hybrid electric vehicle (PHEV, close to core) vis-à-vis battery electric vehicle (BEV, outflanking). A business model describes how “things” work, holistically, like in tomography, today. In addition, as a difference to the business model literature, the literature on strategy comes with rich industrial era epistemology which is applied, expanded and updated for digitalization in this research.

Ecosystem : Platform is a common instantiation of the Strategy : Structure formula with an external focus on multiple complementary and competing players which dynamically blur and recombine industries and markets over platforms as external structures. When the ecosystem concept was introduced in the 1990s, to make a difference to planned and managed alliances, clusters and value networks, it was featured by simultaneous complementarity and competition, expansive dynamics with low barriers and permissionless entry, all these rapidly expanding customer value. In addition, it was not possible to design or plan an ecosystem but it could be orchestrated (Moore 1996, Williamson & Meyer 2012, Venkatraman 2017). Paradoxical ecosystem tensions can manifest as complementing dualities or dualisms which are exclusive tradeoffs (Wareham et al. 2014). Ecosystems can be conceived structurally but the approach in this thesis is that ecosystems are co-created in the interplay of complementary and competing strategies over external structures. I stick to
the original specific meaning of the concept, to make a difference and not diluting it to, e.g., alliances, clusters or value networks (West & Bogers 2014).

2.2 The transformation cycle as a framework and a model

The transformation cycle is a descriptive or prescriptive, either a qualitative framework or a quantifiable model for decisionmaking and management in digitalization. The transformation cycle as the qualitative framework is called Insight into Execution (I2E) and the quantifiable version is Digital Transformation Maturity Model (DTMM).

2.2.1 The qualitative framework version

Figure 2-1 visualizes the transformation cycle with the quadrants (1) insiting, (2) strategizing, (3) planning and managing, and (4) executing. The x-axis as strategy and y-axis as structure are those defined by Chandler, but this framework is also grounded in consultancy practice where the quadrants can be filled with different specific tools. Its qualitative representation, Insight into Execution (I2E) framework, is about dynamic value creation and decisionmaking processes – the explicit management framework for getting things done – resembling those in advisory cookbooks on digital transformation, here described with paths over quadrants. Together, the paths form the Gearshift Knob diagram. Since the early 2000s, I have used and tested this framework in practice with multiple versions and tried to minimalize it. The framework can be supplemented with specific and contextually relevant tools positioned in the quadrants.

The focus on strategy as value increases horizontally (as the x-axis) and the focus on structure as cost vertically (as the y-axis) in Figure 2-1. However, literature and practice show that the differences and boundaries between strategies and structures are not always clear or constant and their borderline may migrate to both directions. Structure eats strategy, e.g., in platformization, or strategy eats structure, e.g., in outplaying platform merchants and service providers with the offerings of the platform owner. Strategy and structure may also compete against each other, as in the well-documented case of Amazon in its dual tensional roles as a merchant and a platform for other merchants and service developers.

Constantinides et al. (2018) described how platforms emerge as architectural and governance control points are opened. In the opposite process of what they call infra-structuring, platforms expand their reach and scope into supply chain management, i.e., to become classic pipeline businesses. Kai-Fu Lee (2018) described how Chinese Internet giants
such as Didi Chuxing, Tujian and Meituan – are expanding Online To Offline (O2O) and becoming operations heavy instead of pure and light online plays. The slowing and increased heaviness of innovation has been discussed in business media concerning, e.g., Tesla and Uber. Parker, Van Alstyne & Jiang (2017) discussed the problem how long platforms should protect external developers before absorbing their innovations into the platform. The authors argued that platforms should prefer open external contracts to closed vertical integration or subcontracting, i.e., inverting the firm.

In literature, the discussion on the paths – i.e., the order of the quadrants – is as old as strategy, spanning from the 1950s to the 2010s, i.e., which is contextually better, the long and slow planning and managing path 2-3-4 or the shortcut path 1-4-1. What I propose here for this dilemma is the high-level visualization of multiple paths as arrows, the Gearshift Knob diagram (GSK) in Figure 2-1, to describe speed and acceleration. This decision and management framework embeds as instantiations what are called designs, e.g., strategic planning process design “deciding who does what, when” (Lorange & Vancil 1976), as well as lean and agile methods.

Collis (2016) conceived lean (here, the shortcut iterative path 1-4-1) and strategy (here, the planned and managed path 2-3-4) as different paradigms but so that lean strategy means both-and. Wirtz (2016:209-214, referring to Mintzberg) recognized three modes of management – entrepreneurial, adaptive, and planning – associated with business life cycle phases. Schönblum & Egle (2017) described the digital transformation as phases from small experiments to digital islands to strategy and full transformation. Venkatraman (2017) phased the digital transformation from experiments at the edge to collision at the core to reinvention at the root. The portfolio of experiments aims at learning and commitment. The transformation cycle conceives these phases as fields of action, parallel and concurrent, in business/corporation, industry/market/network, and ecosystem fractals.

The Gearshift Knob diagram contains known management or scientific frameworks as special cases:

- The short, fast and interactive path 1-4-1 means lean, also called Kaizen, continuous improvement, emergence, agile, prototyping, experimental, bias for action, just do it, value to vision, quick wins, empowerment, small bets, even low hanging fruits. These are leadership slogans for learning, creating passion and energizing people, but also for strategic drifting by muddling through (Lindblom 1959), incremental learning (Quinn 1978), emergence (Mintzberg 1978), or for dynamic (Markides 1999, 2000) and temporary strategies (McGrath 2013).
- The automation of the 1-4-1 path due to datafication and algorithms is the promise of intelligent systems, such as deep learning. The larger the amount and variety of data, the more it can be used improve products and services (Mayer-Schönberger & Ramge 2017).
- 1-2-4 bypasses the conscious decision phase as in Boyd’s OODA loop (Observe-Orient-Decide-Act). Action follows immediately after orientation (Richards 2004:65) like in Kotter’s (2012, 2014) second operating system which bypasses much of formal planning and managing.
- 2-3 means strategy into action (Kaplan & Norton 1996): describe and communicate the strategy, commit, operationalize it by balanced scorecards. Another common way to operationalize strategy is by Gantt program and project charts. This "what" is in Finnish literally "to make strategy to walk".
- 3-4 means "how", e.g., change management through project and program management offices (PMO) whose performance and goals are often measured by maturity levels, and using so-called Talent Supply Chain Management (TSCM) processes discussed in Chapter 3.4.1.

- In double-loop learning, the first loop 3-4-3 measures deviations to plans, the second loop 3-4-1-2 is the feedback whether the strategy remains viable in changing circumstances and after learning. The distinction to single versus double loop (or first versus second order) learning comes from Bateson (1972) and Argyris & Schön (1978) and it was discussed, e.g., by Kaplan & Norton (1996); Espejo, Schuhmann, Schwaninger & Bilello (1996); and Nonaka & Takeuchi (1996). Single-loop learning consists of solving problems as they present themselves. Double-loop shifts the attention to why does this problem exist, "why did we stick for so long to a solution we had found to be inadequate" (Espejo et al. 1996:148-175). Pivoting (Ries 2011) is about translating these long-existing learning concepts into management tools.

- Management guides (e.g., Humble, Molesky & O'Reilly 2014; Gloger 2017) propose ways to combine 2-3-4 and 1-4-1 paths in large systems by enterprise lean or agile program management office (PMO), i.e., designed emergence. Henfridsson & Yoo (the concept of liminality for corporations, 2014) and Dattée et al. (using system dynamics to combine goal- and process-oriented perspectives for creating ecosystems, 2018) exemplify academically constructed frameworks and methods for this paradox. Efficient innovation (Sauberschwarz & Weiss 2018) combines planned Traktion (i.e., using corporate resources to create revenue growth) and lean Kundenfit (customer fit).

- The paradox of change has been discussed in information systems research as the opposing logics of stability and flexibility (Tilson et al. 2010). Boundary resources are the solution to resolve the simultaneous control and generativity, e.g., Software Development Kit (SDK), related Application Programming Interfaces (APIs) and app stores together with the social boundary resources such as incentives, intellectual property rights, and control (Ghazawneh & Henfridsson 2013; Eaton et al. 2015).

The increased dynamics blurs the borders between insighting, strategizing, planning and managing, and executing. The strategy of the 1970s “... drew a sharp, clear line between operational decision making and corporate strategy, highlighting the latter” (Rumelt et al 1994:19). This was a part of the historic sequence 4-3-2 of management science from executing to planning and managing to strategizing. The early strategy was conceived as a new approach to planning. The emphasis after World War II had been on planning based on forecasts without strategy. Kiechel summarized this (2010:xii): "... companies made plans, most simple extrapolations of what they had been doing. Plans, not strategy ... pre-strategy worldview lacked a rigorous sense of the dynamics of competition.” Before planning, scientific management was fully operational. Humble et al. (2014) estimated that 30-50 % of development project time is spent in preparing useless business case presentations. Users or customers do not know what they need but know what they don’t need – after they have seen it. Kogut (2003) argued that planning – together with the legacy “meter and bill” financial model – was the reason for the European laggardness in the global Internet economy.

The shift from planning to strategy was described in a McKinsey paper (Gluck, Kaufman & Walleck 1978) and the shift from operations to planning and further to strategy was discussed by Spender (2014). He noted that the pre-war era of managerial capitalism aimed for efficiency, Taylor in production and Chandler in administration. Operations research,
cybernetics and other wartime lessons accelerated the adoption of planning methods. Spender wrote that the shift towards strategy meant a shift from seeking efficiency to seeking rent by differentiation and focusing on competition to the detriment of only internal operations.

The rise of insighting and the iterative 1-4-1 path was anticipated and called for by Schön (1984:40) who wrote that “...when we set the problem, we select what we will treat as the ‘thing’ of the situation ... we name the things ... and frame the context ...”. He named the reframing of unique and unstable “things” as Reflection-in-Action, different to positivist Technical Rationality. According to dictionaries, a “thing” may refer to a material or an abstract object, often something not yet known, like the next big thing. In popular culture – comics and movies –, a “thing” means something weird or alien, in other words, an unknown. Gallouj (2002:41) characterized software and pure services with “hazy, unstable boundaries” and noted that service innovation often is a recombination. Varian (2009), Yoo et al. (2010), Yoo et al. (2012) and Brynjolfsson & McAfee (2014) emphasized the combinatorial logic in digital innovations, “things” as recombinations, inside corporations and between industries. According to Yoo et al. (2012), a combinatorial innovation means that the product or service boundaries are unknown, needing to invest in distributed creativity with contagious, mutable and evolvable diffusion, resulting in increased complexity, this happening by “... gluing components from different layers using a set of protocols and standards to create alternative digital products ...” (Yoo et al. 2010). The evolving “thing” answers Levitt’s (1960, 1963) classic question “what business you are in”.

As a summary, classic strategy literature emerged from planning and has understated 1-4-1 (insighting to executing and back) and overstated 2-3 (strategizing to planning and managing). This dilemma is well-known in Internet, information systems and organization science literature with generative platforms and boundary resources as proposed solutions. Fitzgerald (2013) positioned most perceived problems of digital transformation into quadrant 2 or strategizing. The Global Innovation 1000 study (Jaruzelski, Loehr & Holman 2013) positioned quadrant 3 or planning and managing as mature and effective and quadrant 1 or insighting as immature, ineffective and fragmented. Thus, this perception of quadrants 1 and 3 as problem-free has opposite reasons; for insighting, the reason is immaturity and lack of tools for the “the fuzzy front-end”; for planning and managing, it is maturity and existence of tools.

2.2.2 The quantifiable model version

Operationalization of abstract concepts is essential for applicability. Digital Transformation Maturity Model (DTMM) is the quantifiable version of the transformation cycle, a numerical dashboard for large sample studies, a checklist of “right” questions for more in-depth studies, or a codebook (Boyatzis 1998:4). When quantified, the current state (as-is), the future state (to-be), benchmarks, gaps and relevance (to-do) can be measured with polar coordinates on the scale one to five. The result, MyDTMM, is a transient and transparent version for a specified purpose. Figure 2-2 shows the ten-point checklist used in my case study with the focus on insighting and strategizing so that program, project, and change management (italicized text) are outscoped due to the lack of data.
In mainstream management literature, detailed checklists and cookbooks often focus on planning, managing and executing. These tools guarantee transparency, reproducibility and scalability, control projects and manage quality and risks even with inexperienced people.

The one-way use of the digital maturity as a measure from level one to level five is universal, rooted in Nolan’s stages of growth framework (1979). An analogous coeval construct is the experience curve (Henderson 1979). The maturity S-curve can be misleading because maturity as a biological metaphor precedes death but the dynamics of digitalization is more complex. Maturity can mean rigidity when new technologies or external services and structures such as clouds and platforms allow leapfrogging. This leads to what economists call stranded assets. The deterministic predictive power of an increasing one-way maturity or experience is unable to address discontinuities. Maturity suits better to describe epistemology, cognition and decisionmaking than ontology.

Measurement is essential for the otherwise invisible digital transformation. For decades, digital maturities or intensities of industries and businesses have been benchmarked, e.g., by cost and investment profiles and later by disruption potential (Bradley, Loucks, Macaulay, Noronha & Wade 2014). These measures are exposed to the danger of measuring digitalization to the detriment of digitalization, e.g., the true digital transformation. Comparative studies have been made, e.g., about the digitization of nations. Grgurevic (2017) and Frank et al. (2017) presented cross-industry and Stüber et al. (2017) retail digital maturity levels, and Deflorin, Scherrer & Eberhardt (2017) measured the digital potential of the business model

Figure 2-2 The transformation cycle as Digital Transformation Maturity Model.
components. As a corporate management tool, Schönblom & Egle (2017) presented a corporate digital transformation dashboard of circa 70 operational measures classified into four groups: community (customers), portfolio (products), partners (network), and resources (financials). As a contrast, in the startup lean context, Croll & Yoskovitz (2013) recommended to substitute complex “vanity metrics” by One Measure That Matters (OMTM) which should change during the business life cycle.

DTMM in Figure 2-2 is closer to a corporate dashboard instead of any single measure such as OMTM or any other one-variable KPI (Key Performance indicator). My case study uses DTMM as the checklist for right questions but large sample studies need simple indicators and proxies that could be detected and quantified even automatically from existing data, such as the predictive metrics in the Fortune Future 50 index based on market value, strategy, structure, people and technology (Reeves 2017).

2.3 The strategy : structure alignment matrix

The strategy : structure alignment matrix is defined by strategy and structure as x- and y-axes, respectively, expanding with new options to the north-east, including a redshift from blue to green to yellow to red to describe aging. Mixing and matching classic and new strategies and structures is something abstract and as such a challenge to communicate, discuss and understand. For this purpose, the strategic slideruler, trident and attractor are auxiliary constructs to feature the properties of the alignment matrix. Separately, the issues in Chapter 2.3 have been thoroughly discussed in literature. What is proposed here is an attempt to simplify, integrate and visualize them, and to put them in a bigger picture with the new triangulated methodology.

2.3.1 The expanding space with a portfolio

Figure 2-3 shows the alignment matrix as a portfolio of strategies and structures. The axes of the matrix expand from classic to new. On the left is a basic version with a portfolio granularity of three, with fits and coherencies positioned on the diagonal, leaving room for possible misfits and incoherencies off the diagonal, based on production, transaction and opportunity costs.

On the right of Figure 2-3 is a more detailed version where the alignment matrix expands further to the north-east, with an emerging and still unknown frontier beyond the event horizon. The aging and expanding options are described by colors, i.e., the redshift. The diagonal consists of the internal corporation with business units (red); the managed and planned collaborative network for value-added services, supply chain and other resources (yellow and green); and the co-created and co-evolving ecosystems (blue) over platforms.
The network is planned and managed with deals, agreements, contracts, alliances and other collaboration tools. Shared capabilities allow companies to focus on their core. It is important to make a difference – even if blurred – between these arrangements and the co-created and co-evolving ecosystems over platforms (Moore 1996:27, 56). This was not yet understood or accepted in the dawn of the Internet era. Doz & Hamel wrote in The Alliance Advantage (1998:ix) that “… simplistic typologies and grand metaphors about ‘eco-systems’ and ‘co-evolution’ are of little value to executives charged with extracting profit and competitive advantage from complex partnerships in tumultuous times.” In retrospect, a number of strategic alliances have either failed or been marginalized, outflanked by ecosystems over platforms.

The expanding blue zone in the matrix comes with new options, including the established Internet conglomerates, and startups and adjacents from outside the incumbent box. For brevity, I call these invaders adjacents and startups. The outermost and still unknown zone is the frontier beyond the event horizon, colored deep blue.

A black hole is drawn between the network and the ecosystem because some stars – major companies and industries – have disappeared here, without being able to escape, collapsing at the end of their life cycle, maybe absorbing mass from their surrounding planets, i.e., second-tier companies dependent on these stars. Such supermassive black holes have been detected in, e.g., computer, telecommunications, media and retail domains, threatening to expand to other industries with the assumed next cycle Internet of Everything during The Roaring Twenties. Staying away from black holes is the challenge to corporate innovation. The black hole corresponds to Benkler’s (2006:22, 32) “battle over the institutional ecology of digital environment” between what he called the industrial and networked information societies.

How to categorize the axes? Notwithstanding the simple example in Figure 2–3, the axes are continuous, and with (mis)fits and (in)coherencies between strategies and structures the alignment matrix may look like a kids’ colored ball pit at business and corporate; network, industry and market; and ecosystem levels.
The alignment matrix generalizes the service : channel matrix (Mäkelin & Vepsäläinen 1989, Apte & Vepsäläinen 1993). The fits on this original matrix diagonal were based on minimizing production and transaction costs. Trying to automate complex and contingent services meant high transaction costs to prevent hazards whereas manual simple services caused high production costs. During this pre-Internet era, it was understood that channels can be automated, people-centric or mixed, high tech high touch as Naisbitt had written (1982). The service : channel matrix was developed and used in a large number of projects in finance, communication, retail, travel and hospitality, media, health, manufacturing and public services since the late 1980s. Lessons learnt from these projects were the need for comparative analyses to detect and highlight differences – the essence of strategy –, and a Requisite Variety of practical and repeatable tools for the operationalization of the matrix.

As to the new strategy : structure alignment matrix, from a developer perspective, creating “things” for classic (internal, closed and asset-specific) structures is expensive, due to learning and negotiations compared to new (external, open and shared) structures where even small teams can deliver, inside the firm or on the market. Increased dynamics calls for right-timing which means that the alignment matrix highlights opportunity costs. Coherence as an extension to fit means synchronization and mutual amplification so that complementaries in new strategies over new structures create more opportunities than internal work.

The alignment matrix is also a business portfolio framework. The Boston Consulting Group (BCG) portfolio model (Henderson 1979; the lifecycle from question mark to star to cow to dog) was based on financing. The corporation was supposed to need a cow (a mature milking business) from which cash – a few percent of the revenue – is allocated to create new stars. Due to advances in financial markets, capital is now available for plausible and trusted firms without own cashcows. Firms such as Amazon and Tesla created huge market capitalizations without profits, understated by incumbents just because of that. As to the colors, a green-yellow-red traffic light management system was introduced as the GE McKinsey portfolio matrix also during the 1970s. Here the axes were business unit or product strength and industry or market attractiveness, resembling the efficient innovation of Sauberschwarz & Weiss (2018). GE was a major manufacturer of, e.g., traffic lights – their portfolio coloring did not have a blue traffic light for the future customer need, nor did the traffic lights of Pasternack & O’Toole (2002). The alignment matrix constitutes a new portfolio management framework with the red-yellow-green-blue palette based on expansion with new options and threats in blue. In the dawn of the mobile Internet, most value became from future “things” with a focus on customer value (Baldwin & von Hippel 2011) which can also be expressed as “… the traffic lights, they turn a blue tomorrow … ” (Jimi Hendrix 1967). The blue zone resembles the blue ocean of Kim & Mauborgne (2005:12, 16) where the simultaneous pursuit for value (here, new strategy) and lower cost (here, new structure) happens. Sauberschwarz & Weiss (2018) defined the efficient corporate innovation which builds on existing business, corporate, network and industry strategies and structures to create both Traktion (i.e., revenue) and Kundenfit (customer fit), “as close to core business as possible, as disruptive as needed”, creating a rainbow-colored ball pit in the alignment matrix with both additive and disruptive elements.

What is new or modern becomes classic, common or obsolete in time, needing to expand the alignment matrix portfolio to north-east to discover new options or backtrack to a hybrid portfolio by adding vertical pipes. Despite that, I have not tried to invent descriptive
vocabulary for the categories of the axes at this level of abstraction. Albeit unimaginative, it is not rare to label strategies and structures with numbers such as 1.0, 2.0, 3.0 and 4.0, or letters such as X, Y and Z. Classic economics exists and new strategy or economy was a common expression in the 1990s. In military theory, Biddle’s (2005/2010) modern doctrine combines new technologies and structures much in the same way as in business. Alibaba’s Jack Ma (2016) coined the term new retail for integrating E-Commerce, stores, logistics and data.

There are similarities and differences between the alignment matrix and the Business Model Option (BMO, Grgurevic 2017) matrix where the axes are commercial and operational models, instantiations to strategy and structure. BMO axes reach from existing to new, scored by digital maturity or intensity levels between one and five using ten criteria modified from Osterwalder & Pigneur (2010). Common to BMO and alignment matrices is the expanding space to north-east, due to emerging options, but the BMO matrix comes with a moving origin because what is existing moves ahead with time. The alignment matrix has a fixed origin because some business elements may stay as classic, despite being digitized, and it is not rare to reverse by adding classic to new, e.g., in the case Amazon.

2.3.2 Value-adding and outflanking routes in the alignment matrix: the strategic slideruler

As integrative hypernyms, both strategy and structure need to integrate themselves so that classic and new strategies and structures are defined along what I call the strategic slideruler with alternative additive or outflanking routes and sweetspots.

One cannot keep away from encountering literature about revolutionary strategies and structures, new winning paradigms (Hamel 2000), often induced by new low-end but evolving technology (disruption, Christensen 1997)\textsuperscript{16}, that is about to substitute classic and old, as periodically in science (Kuhn 1962/1970). Based on literature, a simple checklist for separating the classic and new extremes is curated in Table 2-1. What is classic is well-defined whereas new is a patchwork in a flux and challenging to freeze.

Economics/finance and marketing/positioning are mentioned first in the checklist as they are close to classic strategy. Although economists (e.g., Solow, Krugman, Stiglitz) have been critical to the real value of digitalization in general and the Internet in particular, in Table 2-1 economics refers more to managerialism (Sloan 1964) than the theories meant by Porter (1994:424), Kay (1995, 1996) and Spender (2014). Strategies and structures can also be explained by economic theories (Williamson 1985:24, Choudary et al. 2016). Financial innovations have enabled new strategies and structures, their entrepreneurial orientation without the need for an internal cashcow, and with information-based monetization from customers, services and developers.

\textsuperscript{16} Lepore (2014) criticized disruption: "... many of the failures that are often seen to have resulted from failing to embrace disruptive innovation look like bad management … disruptive innovation is a theory about why businesses fail ... It doesn’t explain change". This was answered by Christensen (Bennett 2014) and others (Gilbert 2014; King & Baatartogtokh 2015; Christensen, Raynor & McDonald 2015): disruption is an evolving theory, neither universal nor final, and it lacks tools. In Heinemann, Gehrckens & Wolters (Hrsg., 2016), transformation and disruption were conceived as different paths, evolution from existing vis-à-vis revolution due to adjacents and startups. Thiel & Masters (2014) advised to avoid the disruption word to keep intentions secret.
The strategic slideruler is a corollary from Chandler's observation and prediction that technology creates new strategies and structures. The slideruler describes the transformation as a continuum with alternative additive or outflanking routes between classic and new. The slideruler is based on the idea that instead of the extremes and either-or as in Table 2-1, it is important what happens in-between, i.e., what are the dynamic patterns in decisionmaking and management, strategies, structures and systems.

Positioning the complex fragmented fields of strategies or structures along one dimension as in the slideruler is an utter simplification required by the alignment matrix. It is lucrative to label the slideruler ends 1.0 and 2.0, as has been common in management literature, so there are routes from internal corporation 1.0 towards value-added services and resourcing as enriched strategy and networking as structure, with outflanking adjacents and startups going directly to 2.0. The classic 1.0 end means a corporate focus with one-way value chains, product-market portfolio and resource-based view and other strategy and research streams which originated in the analog era. Types of planned and managed networks – such as value constellations, nets, systems, alliances, clusters, and E-Business, supply chains, XaaS or X as a Service – position in the middle area of the slideruler, enabled by the early digitalization. Summarized in Table 2-1, emerging new strategies and structures in the 2.0 end associate with external platforms, ecosystem complementarities with low barriers and permissionless entry, expansive generative dynamics, needing leadership which sees people as more than resources.

It is challenging to make sense of the structure axis. Since the 1980s, the internal company-wide 1.0 structure has been called the enterprise architecture by software and ICT industries. Product strategies were based on internal architectures as well (Clark & Wheelwright 1992:96). The extended enterprise architecture with networked supply- and demand-chains and services locates itself in position 1.X. New 2.0 structures are external and open multisided platforms with open data, analytics and intelligence, no more connecting people only but machines as well. These definitions look at the structures through the technology lens with the assumption that flat and communicative internal and external social structures are enabled by and follow from technological innovations, “... tearing down the old analog world and its associated social infrastructures” (Tilson et al. 2010), i.e., “social follows technology” in structures. This was also the lesson learnt from the service : channel matrix where the channel technology as the lead variable drove the social organization as the lag variable.

<table>
<thead>
<tr>
<th>Indications for classic strategies and structures</th>
<th>Indications for new strategies and structures</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Close to economics/finance and marketing/positioning, managerialism, value extraction from customers</td>
<td>(1) Close to technology which changes strategy and management, new business and financial models, value migration towards customers</td>
</tr>
<tr>
<td>(2) Value chain and cluster analysis, industry as the arena of competition and substitution with high barriers of entry</td>
<td>(2) A more open platform-based complex including adjacents and startups, complementarity with low barriers of entry</td>
</tr>
<tr>
<td>(3) Portfolio and process management based on internal architecture and general managerial skills, internal focus on hierarchy</td>
<td>(3) Horizontal ecosystems over external platforms, devalued general managerial skills, external focus on market</td>
</tr>
<tr>
<td>(4) Simple dynamics with equilibrium and stability, time-less managerial skills, insighting irrelevant vs. plans</td>
<td>(4) Complex dynamics and change, coherence with timing, insighting with experiments and learning</td>
</tr>
<tr>
<td>(5) Less emphasis on leadership, people as resources, competences as measurable knowns, “things” defined by planning</td>
<td>(5) Leadership and people make a difference, world-class digital expertise as non-linear and stealth, “things” learned by discovery</td>
</tr>
</tbody>
</table>

Table 2-1 A checklist for comparing the extremes in the classic to new continuum.
The big “things” in Internet of Everything – such as retail, traffic, energy, housing or health – are positioned in 1.X, i.e., they are Online To Offline (O2O) or Cyber-Physical Systems (CPS)\(^\text{17}\), splitting between hardware boxes, physical places and virtual spaces. German literature (Reichwald & Möslein 1995, Hoffmeister 2015) has used the concept pair *gebunden* versus *ungebunden* service where the latter is not connected to a box, place or person. Early service research in the 1980s focused on *gebunden* services, such as restaurants or airlines, where service production and consumption were simultaneous and in the same place, called the moment or place of truth. But now the challenge is to reimagine and accelerate scalable *ungebunden* services, even without the slow and expensive physical, local or personal element. On the other hand, *gebunden* service components can build barriers to entry for global competition.

The transformational challenge becomes to combine fast and scalable online with slower offline, the latter with local investments, installations and connectivity to existing equipment base with barriers for entry. Which side is dominant, online or offline? Is it possible to postpone the offline, for example, to wait for Machine To Machine (M2M) technology maturity, maybe to bypass it altogether, in the hope that “software eats everything”? To what extent could Internet of Everything happen without M2M, as *ungebunden* services, untied to boxes, places or people? Is it possible that the future innovation decelerates because of massive *gebunden* hardware, analog and people elements?

Examples of additive thinking are Porter & Heppelmann (2014, 2015) and Schallmo & Rusnjak (2017:25) who presented a staged route of added value and networking: from product to intelligent product to networked product to product system, and finally, to system of systems. This has been typical to Industrial Internet. Known examples of consumer-centric successful resource-based value-added services close to core have been Apple App Store, Amazon Kindle and Netflix whereas Xerox and Kodak were unable to commercialize their revolutionary products. Literature has described Apple and Amazon as tightly managed “one companies”, but paradoxically, App Store and Kindle as value-adding strategies close to core became new open structures for ecosystems, combining “loose and tight”.

The idea of two different routes was popular in the late 1990s. Bryan, Fraser, Opperheim & Rall (1999) described alternative routes: an incumbent company expanding one country at a time doing same but better, and a new specializer on the Internet, born global, both routes ending in joint “shaping”. The first route is incremental and slow (additive from 1.0), the latter radical and fast (outflanking to 2.0, and eventually backwards in the case of overshooting).

An example of outflanking is the automotive industry which is adding value to its products through both local intelligence and cloud connectivity, to serve either the driver or ride-hailing. In the latter case, the industry and its competitors prepare for platform-based

\(^{17}\) O2O is originally a Chinese concept without a shared definition. In Western literature, O2O is sometimes misunderstood as omnichannel: “... web site or mobile advertisement that entices someone into making a purchase in a physical establishment. Groupon is the premier example.” http://www.pcmag.com/encyclopedia/term/66511/o2o. Omnichannel was defined by Techtarget.com (Rouse 2014) as “the seamless melding of the advantages of in-store … shopping with the information-rich experience of online shopping. What distinguishes the omnichannel customer experience from the multichannel customer experience is that there is true integration between channels on the back end...”. Commerce-oriented definitions miss the relation of O2O to Internet of Everything which differentiates it from omnichannel. Typical O2O services are traffic (online order, offline delivery), energy (offline installation of a solar system or thermostats, online use) and health (online tracking, offline health checks). It is the offline and thus the local component that delays scaling and fragments the service, but may act as a barrier of entry. CPS – although a U.S-based concept – is widely used in German literature, e.g., in several articles in Schallmo et al. (2017).
debranding to transform products into mobility services, e.g., Uber, Lyft and Volkswagen’s Moia services. Cole (2015) noted that if Internet industries engage the customer, box makers (current car companies) are in danger to be relegated to subcontractors. Meeker (2016:137-159) described the U.S. strategy back to the automobile leadership of the 1950s now by radical technologies and business models, as happened in consumer electronics with smartphones.

The literature on Internet strategies and structures seldom refers to classic strategy. Instead, it has created new methodological constructs and vocabulary such as business models, ecosystems, platforms and digital intensities or maturities as memory-cleaning “hard reboots”. An exception was Gawer & Cusumano (2013) who associated platforms with new structures “(platform) ... as a set of assets organized in a common structure ...”. As the theoretical foundation of this research includes the linking of classic and new, a detailed review of the (r)evolution of strategies and structures is needed. For this purpose, the classification into corporation, networking and ecosystem is used.

**Corporate strategy and structure.** The alignment matrix as a portfolio rejects the idea that classic strategies and structures are all over or bad. Classic is not pejorative but appreciative, it is not to be abandoned but put in broader context. Industrialization created the profession of management, defined as a set of skills and tasks. The pre-strategy era focused on single business operations, planning and managing. The classic strategy was created by people with diverse backgrounds. Drucker wrote in the introduction to Sloan’s (1964) book that “… it was meant to establish a new profession, that of professional manager, and to spell out the professional manager’s role as leader and decision maker”. Reflecting Zeitgeist, Rumelt concluded that “the critical resource of the modern, diversified, multidivisional firm is general management skill ...” (1974/1986:156) and his definition of a “good strategy” in 2011 still echoes the centrality of planning and managing.

Methods of corporate strategy include industry analysis such as Porter’s five forces and value chain (1985) – developed from McKinsey’s business system (1980) as well as Smith’s division of labor and Taylor’s Scientific Management (Spender 2014) – and portfolio management (Henderson 1979). Process management and enterprise architecture need to be added to this list because they are fundamental to one company structures and emerged also in the 1980s. In addition, much of classic strategy is based on a punctual equilibrium assumption seen in concepts and beliefs such as sustainable strategy, essential advantage, barrier of entry, critical mass, switching costs, rule of three, general managerial skills, business as usual, and one best way. Gartner’s hype curve and Geoffrey Moore’s chasm are equilibrium concepts as well. Due to undervalued dynamics, insighting is absent from classic strategy, and despite the human relations movement started in the 1930s, leadership and people play a side role, dethroned by Taylor (191120, Kiechel 2010).

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18 Kiechel (2010) described how business schools were latecomers to the field of strategy. Their initial market gap came from consultants who did not publish their methods as comprehensive books. The dynamics of idea propagation has been analyzed also by Davenport & Prusak (2003), Ricci & Volkmann (2003), Kasanen, Lukka & Siitonen (1991) and Kaplan (1998).

19 Rumelt (2011) 37 years later restated his early emphasis on general managerial skills by stressing the how in “good” strategy: a good strategy is an action plan, whereas a “bad” strategy is “long on goals, short on policy and action”, or “all results, no action”.

20 Taylor (1911:6-7) wrote in The Scientific Management that “in the past …if one could get a right man, methods should safely left to him” but “…the man has been first; in the future the system must be first”. Classic management from Taylor’s era put things over people. “Heroic” or people-dependent is still the lowest level of process
During the analog era, Woodward (1956/1965) and Thompson (1967:51-65) presented structure-focused frameworks which explained the internal fit between technology/production vis-à-vis social or organization. The analysis of the external fit between an organization and its business environment goes back to Burns & Stalker (1961/1994), Lawrence & Lorsch (1967) and Ansoff (1978) whereas Emery & Trist (1965) and Katz & Kahn (1966/1978) created environmental typologies.

The resource-based view as a whole is more structural than customer- or market-oriented even if customers have been conceived as resources (Ives & Learmonth 1984). Still during the analog era, Wernerfeldt (1984, 1995) defined resource as any company strength or weakness. Resources are strategic if they are valuable, rare, inimitable and non-substitutable (VRIN, Barney 1991, 1997/2002). The primacy of economics and marketing in strategy was challenged with more technological approaches, contested by claims such as technology can be a core but marketing is a supplementary capability (Leonard-Barton 1995) or that functionality-related competences – those related to products and technology – substitute market-access and integrity as sources of competitive advantage (Hamel & Prahalad 1994). The resource-based view remained somewhat abstract, theoretical and rearmirror looking. A resource could mean anything, in practice it was about “S” and “W” in the SWOT framework (Strengths, Weaknesses, Opportunities, Threats). Dynamics was added to resources by dynamic capabilities (Teece, Pisano & Shuen 1997), by defining the adaptive corporation as a dynamic system of interactive commitments and capabilities (Haeckel 1999), by bricolage as “creating something from nothing” (Baker & Nelson 2005) in entrepreneurial context, and resource orchestration (Sirmon, Hitt, Duane & Gilbert 2011; Nambisan, Lyttinen, Majchrzak & Song 2017).

Hamel & Prahalad focused on strengths and defined core competences as those leading to growth, being inimitable and creating customer value, often compared to the roots from which the tree, branches and leaves grow, with a preference to technical and scientific competences. Selznick’s (1957) view on distinctive competences had been softer; they were the means to retain an organization’s integrity, tools to allocate resources and to create the identity. Competing with capabilities became a popular topic in the early 1990s (Stalk, Evans & Shulman 1992; Mäkelin & Vepsäläinen 1995).

Klavans (in Hamel & Heene 1994:172-173) wrote about the schism in the literature of core competence. One group of researchers (Schumpeter, Penrose, Ansoff and to some extent Andrews) focused on science and technology, the second group on the formation of organizational intentions. The intellectual root of this second group was Selznick’s work on leadership. Klavans recalled that Selznick was interested in firms’ critical decisions which affect the basic character of the firm and require creativity in the fundamental (re)definition of a firm’s goals. Klavans (1994:173) referred to Selznick who had stated (1957:75) that “… in particular, if a leadership acts as if it had no creative role in the formulation of ends, when in fact the situation demands such a role, it will fail, leaving a history of uncontrolled, opportunistic adaptation behind it”. Klavans concluded that Hamel & Prahalad’s work also contains a leadership orientation, focusing on the question what shall we be (strategic intent, foresight, stretch). Later, Spender (2014) made a clear difference between the resource-based school and people-centricism.
**Networked strategy and structure.** Transaction cost and agency theories together with the dawn of digitalization laid the foundation for a more networked view of strategy and structure. System-theoretically, this was about loosely connected systems. This was initially about make or buy, supply chains, and outsourcing with relationship management and collaboration. Management literature recommended to substitute value chains by systems, constellations (Normann & Ramirez 1994) or nets (Parolini 1999). Dyer & Singh (1998) named the cooperative and interorganizational strategy school as the relational view. Types of customer involvement and service provision were described by Gallouj (2002:39). “The age of access” meant that it is more important to access than own resources (Rifkin 2000).

Core was no longer the inside, nucleus, kernel, roots or seeds, as in Thompson’s proposition “... seal of their core technologies from environmental influences” (1967:19). Lavie (2006) concluded that “... the nature of relationships may matter more than the nature of resources in networked environments”. The new core was the outside, something that had been held less valuable or marginal, like the knowledge, service and experience shell (Tapscott et al. 2000; Frank et al. 2014) over the hardware inside. Firms in all industries were urged to innovate these shells. The new core was like the forest, no more the trees. Technology-enabled value was seen to flow inside out, from concrete doing to engagement and orchestration, e.g., from driving or flying or hotel-keeping to managing relations between customers and partners. Key concepts included E-Business in the 1990s and X as a Service (XaaS) in the 2000s, X denoting a business process or resource over an external structure.

Kiechel (2010) argued that not much had happened in strategy since the mid-1990s. Strategy was in a standstill. Spender (2014) restricted a similar conclusion to consultants – “... the absence of progression in (their) strategic thinking in spite of the great changes to economy at large and to how business is done...” – and used expressions such as “fifty-year old concepts” and “retroware”. Notwithstanding that much has happened after the 1990s, maybe the perception of the lack of progress depends on that the new strategy has been a patchwork without a name and holistic treatment such as Porter on classic strategy a generation earlier.

**Toward ecosystems.** Chandler had described (1962) how technology creates and demands new strategies and structures and that leading industries are followed by others. The Information Superhighway in the early 1990s was initially associated with television. Its metaphors were railways and roads; with the history of late 19th and early 20th century industrial enterprise, and with the mid-20th century emergence of the suburban service society based on the highway network. But the technology was not yet mature. Investors and industries fought over who could deliver the vision and reap the harvest. Media and telecommunication giants believed they own this emerging huge market. Visiting global congresses in the early 1990s, I witnessed how market forecasts were dominated by incumbents whose valuations skyrocketed. In the end game, the winner was the Internet and the startups built on this new structure. Nobody led or managed that, it had neither an operator nor a strategy in the classic sense.21

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21 TIME magazine cover story outlined television as the Info Highway in April 12, 1993. This idea remained sticky despite that the cover story in July 25, 1994 was about the Internet which was soon delivered by the IT industry, not by media and telecommunications. Anderson wrote in The Economist (July 1, 1995) that “...the information superhighway will arrive sooner, but it will a very different kind of road from the one the giants intended... cable and telephone companies are still a decade from delivering... Internet delivers more of the features of the fabled superhighway... produced by people whom the corporate world might consider nobodies.”
The emerging superiority of what was called the horizontal business model was described by Collis, Bane & Bradley (1995), Grove (1996:39-52) and Seaberg, Hawn, Dincerler, Eugster & Rao (1997). The new competition was more between platforms than between firms (Bresnahan & Greenstein 1999). A broad interpretation for horizontality was given by Kogut (2003:50). Its main characteristics are early venture capital financing, equity markets for Initial Public Offerings (IPO) of newly founded firms, fluid labor markets for global talent, fiscal policies that lower the costs of starting and operating a business, and the proximity of universities and research institutions. Kogut also noted the influence of military and industrial policies, social capital, entrepreneurial culture, and bankruptcy legislation that limits personal risks (2003:57-58). This horizontal Silicon Valley model was the signature of the success of the American innovation system, globally marketed for national policies due to its performance in radical innovations (Kogut 2003). This made a difference to the European “C”-oriented (“C” in ICT) industrial planning tradition. According to Kai-Fu Lee (2018), the Chinese model resembles the Silicon Valley model except being more competitive and faster.

For this emerging new strategy and structure, the pivotal year was 1996 when new literature flooded. James Moore’s ecosystem article (1993, McKinsey Award for the Best Harvard Business Review Article) was followed by a book (1996).

Like classic strategy, new strategy was created by people with diverse backgrounds. Chandler had (1962:21, 23, 38-39) described how railroad and telegraph companies were the first to need and develop new methods of management in the 1850s. This idea was noted by Moore (1996:17) who wrote that the hottest centers of economic activity are devising fresh approaches to strategy and leadership which propagate across the general business landscape and have a dramatic impact on how business is done. He defined a business ecosystem which (1996:15) “... span(s) a variety of industries. The companies within them coevolve capabilities around the innovation, and work cooperatively and competitively to support new products, satisfy customer needs, and incorporate the next round of innovation.” He argued (1996:13): “The notion of an ‘industry’ is really an artifact of the slowly paced business evolution during the middle of this century ... [it] is a tired idea whose time is past...” and (1996:50): "... the ecosystem cycle is relentlessly proactive and creative, rather than, as in the case of the industry cycle, reactive and restrained". Complementors were highlighted by Brandenburger & Nalebuff (1996:17) who wrote that “complements have been largely overlooked in business strategy”. Complementors had been discussed by Porter who gave them a relatively modest role. Porter had defined industry as “the fundamental arena in which competition occurs” (1985), “as the group of firms producing products that are close substitutes for each other” (1980), and cluster by horizontal (such as shared technology, customers, and channels) and vertical (such as supply chain) linkages between industries,

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22 McClellan’s The Coming Computer Industry Shakeout (1984) had predicted a consolidation leaving IBM, Xerox, DEC and Wang as the computer industry winners. It did not see the coming deconstruction, demonstrating how experts are anchored to the past.

23 In the 1980s, LANs (Local Area Networks delivered by IT start-ups) won the incumbent PBX industry (Private Branch Exchanges offered by telcos) in competition for corporate data communication. I was at the time an office system consultant and followed this closely. PBX vendors envisioned their voice box as the data communication hub with CTI (Computer Telephony Integration). Partnerships and alliances were announced between IT and PBX vendors. This was round one over LANs. Round two was fought during the early 1990s when IT industry’s TCP/IP protocol won over the telco industry’s X.25 and ISDN initiatives in WANs (Wide-Area Networks). Round three in the 2000s led to complementarity of WLAN hotspots and mobile access but horizontal services Over The Top (OTT) of the Internet won even in messaging and collaboration formerly considered as telco territory.
giving rise to the virtuous cycle of national competitive advantage. W. Brian Arthur (1996a:106) argued that the new ecosystem approach is fundamental to high technology: “... players compete not by locking in the product of their own but by building webs – loose alliances of companies organized around a mini-ecology – that amplify positive feedbacks to the base technology”. He hesitated whether ecosystems would work in traditional industries; the approach is suitable for high technology, and increasingly for services, but not for bulk. Later, this early intuition became wide-spread as the belief crystallized by a Motley Fool slogan for the resistance to change: “It won’t happen to us!”.

So in the 1990s, ecosystems were featured by simultaneous complementarity and competition (coopetition, Brandenburger & Nalebuff 1996), expansive dynamics with low barriers and permissionless entry, all these co-creating expanding customer value. It was not possible to design or plan an ecosystem but it could be orchestrated. The ecosystem in this original meaning is based on the interplay of expanding strategies and structures and makes a difference to planned and managed alliances, clusters or value networks.

Gradually, it was conceived that ecosystems require external platforms, combining the visible hand in platform planning and the invisible hand in co-evolution. After communications and media, retail and finance, traffic and energy are transforming to Internet services based on software, datafication and algorithms. The shift of value demeaned hardware to context (Geoffrey Moore 2000, Figure 1-1). Vitalari & Shaughnessy (2012) emphasized the elasticity of the core and the role of adjacencies in digital convergence. The general purpose and generative (Zittrain 2006, Bauer 2014) nature of digital technology and the skills of digital conglomerates have enabled them to fight against each other and incumbents in many territories, they are after literally Internet of Everything.

The dotcom crash and the diversity of the new strategy delayed its espousal. Porter (2001, McKinsey Award for the Best Harvard Business Review Article) wrote about the Internet as an enabling technology which does not change strategic thinking, it is an operational issue. He emphasized the Internet in traditional businesses: focus and build on existing, think in terms of value chains and forget murky business models, avoid dynamics and strive for sustainability, beware of value migration to customers. Before this, Paul Krugman (1998) had written that “... by 2005 or so, it will become clear that the Internet’s impact on the economy has been no greater than the fax machine’s”. He later explained he is no expert in tech. Tapscott (2001) responded to Porter by writing that the Internet is not just a technology but a new platform for two-way digital media, far more important than, e.g., radio and television, and a new social infrastructure similar to roads in the 20th century. A backlash imputed to digital innovations was the financial crisis of 2007 (Stiglitz 2014).

As noted, referred and explained in the introductory Chapter 1.1, new strategies and structures with insighting, strategizing, managing and executing processes became extensively discussed, conceptualized, theorized and modelled in mainstream academic literature during the 2010s. Additional references to those in the introductory Chapter 1.1 include Parker & Van Alstyne (2005); Gawer (2009); Baldwin & von Hippel (2011); Suarez & Kirtley (2012); Gawer & Cusumano (2002, 2008, 2013); Bharadwaj, El Sawy, Pavlou & Venkatraman (2013); Hagiu (2014); Henfridsson & Yoo (2014); Wareham et al. (2014); Choudary et al. (2016); Nambisan et al. (2017); Parker et al. (2017); Bogers et al. (2018); Täuscher, Hilbig & Abdelkafi (2017) and other articles in Schallmo et al. (2017); Constantinides et al. (2018); and Dattée et al. (2018).
Eisenmann et al. (2006) summarized that “... in the traditional value chain, value moves from left to right: To the left of the company is cost; to the right is revenue. In two-sided networks, cost and revenue are both to the left and the right, because the platform has a distinct group of users on each side. The platform incurs costs in serving both groups and can collect revenue from each, although one side is often subsidized.”

According to an MIT survey (Innovation@work Blog: The ups and downs of dynamic pricing), 14 of the 30 most valuable brands were platforms in 2013, with home bases in the U.S. and China, not in Europe. Owyang’s (2014, 2016) Collaborative Economy initiative listed industries or horizontal as potentials for platformization: goods, food, services, transportation, space, money, health & wellness, logistics, corporate, utilities, municipal, and learning; literally, Internet of Everything. Bogers et al. (2018) argued that “digital technologies and the Internet ... finally move to the highly regulated sectors of health, energy, transport, or finance ... the world where bits, atoms, and even cells combine in new and interesting ways ... areas that have not seen much impact from digitization and productivity improvements.” Yoo (2010) proposed a research agenda for computing in everyday life defined as experiential computing.

The literature on how to move from classic to new strategies and structures – the slideruler issue – is rich and controversial with additive and outflanking routes and reverses. The views of authors differ concerning outside-in (learning from customers and digital giants, e.g., Venkatraman 2017) vis-à-vis more inside-out (staying close to core and focus incremental revenue, e.g., Porter 2001, Sauberschwarz & Weiss 2018) approaches.

2.3.3 Multiple strategies and structures in the alignment matrix: the strategic trident

Multiple strategies and structures are summarized by the strategic trident (not a single intent) where the gig spikes are the existing business, new business, and mergers and acquisitions (M&A). This is a common topic in management literature, here simplified and discussed as a rationale for an alignment matrix portfolio with multiple positions.

Prahalad & Hamel (1989) introduced the strategic intent as the single, stable, focused, stretching, and ambitious goal known and shared by the organization. It was often expressed as “beat or encircle X”, like by Nokia’s former CEO Stephen Elop whose Microsoft-originated “beat Google” led him to choose Windows Phone when killing the Symbian operating system. Strategic intent is rooted to the era of classic strategy characterized by existing competitors, without the outflanking adjacent and startup dynamics and recombinations enabled by digital structures. Multiple strategies are often called dual but here the concept is strategic trident as literally a trinity:

- The first gig spike is for existing businesses which are internally, customer- and competitor-focused with planned rational incrementalism, digitization, “10 %” (Thiel & Masters 2014), close to core, based on processes and metrics, waterfall or critical path project methods and continuous improvement. “Beat X” focuses on traditional competitors possibly even to the detriment of customers, technology and new competitors or complementors.

- The second gig spike is for new businesses which bring something new to market or conquer new markets, possibly “10x” (Thiel & Masters 2014). This digitalization might be close to core (Sauberschwarz & Weiss 2018), such as Apple App Store and Amazon Kindle, or require a forced misfit, a different system and a distant position in the
alignment matrix. The advice from Venkatraman (2017) was to first clearly separate the new digital business (e.g., by venturing) and later to morph it with the core to reinvent the business. Foster (1986:197-199) discussed the duration, pros and cons of hybridization and Suarez, Utterback, von Gruben & Kang (2018) identified “the hybrid trap” in introducing new technology with an auto industry example. Henfridsson & Yoo (2014) described an innovation process for institutional entrepreneurs dealing with the ambiguity between existing and new. Dattée et al. (2018) proposed a method based on system dynamics for uncertain situations without a clear value proposition yet.

- The third gig spike describes mergers and acquisitions. E.g., digital conglomerates are known for frequent acquisitions, fueled by their high valuations, buying and recombining services, capabilities and teams like Lego bricks, at the same time blocking these from others. Mergers and acquisitions started in two waves (Kiechel 2010). In the 1960s, U.S. antitrust legislation and post-war boom with high profits together with the belief in general managerial skills led to diversifications which created the strategy as a portfolio as “the new era of managerial capitalism” (Chandler 1990:621-628). Then, due to financial innovations, the 1980s started the era of startups, takeovers, leveraged buyouts and private equity. These parenting (Goold, Campbell & Alexander 1994) decisions are sudden events, coming as surprises.

Table 2-2 is a curation of multiple classic and new strategies and structures. Corporate portfolio management of the 1970s was about self-financing by cashflow and/or about the fit between business/product and industry/market. Due to financial innovations, startups or corporate renewal initiatives can access external sources of financing which has accelerated dynamics and emphasized insighting.

Enterprise strategies and structures fuelled the ERP (Enterprise Resource Planning) industry led by, e.g., Microsoft, Oracle and SAP. Such “one company” strategies and structures appear in the case study: global Vodafone’s Japanese country operation was acquired by local Softbank in 2006 (Softbank divested its Japanese telecommunication company in 2018), the players (Elisa, Sonera, DNA) on the Finnish market, and Nokia’s business infrastructure.

Generic strategies and value disciplines are supposed to be mutually excluding: cost, differentiation or focus. Porter wrote: “don’t get stuck to the middle” and “the essence of strategy is choosing what not to do” (1996:70). The advice of selecting what not to do contradicts with the everything strategies of digital conglomerates. A similar trend was discussed by Gallouj (2002:79-87) who explained the birth of very large generalists by bundling and recombining services, unconsciously predicting the emergence of digital giants.

Ambidexterity (Benner & Tushman 2003, Tushman & O’Reilly 2004, Benner & Tushman 2015) is the capability to exploit and explore at the same time and independently. Benner & Tushman (2015) – when reconsidering their 2003 article – argued that the impact of open innovation on the organizational, strategy, and innovation literature has been minimal and urged to progress to more nascent theory and research on external innovation.
<table>
<thead>
<tr>
<th>Concept</th>
<th>Origin</th>
<th>Legend or context</th>
</tr>
</thead>
<tbody>
<tr>
<td>Portfolio management</td>
<td>Boston Consulting Group, GE McKinsey 1970s</td>
<td>Recognize question marks, stars, cows and dogs; manage portfolio by traffic lights</td>
</tr>
<tr>
<td>Enterprise, one company</td>
<td>ERP firms and consultants in the 1990s, e.g., Davenport (2000); Porter (2001)</td>
<td>Harmonize the operating model, i.e., the enterprise architecture</td>
</tr>
<tr>
<td>Generic strategies</td>
<td>Porter (1985)</td>
<td>Choose one: cost, differentiation or focus</td>
</tr>
<tr>
<td>Value disciplines</td>
<td>Treacy &amp; Wiersema (1995)</td>
<td>Choose one: operational excellence, product leadership or customer intimacy</td>
</tr>
<tr>
<td>Classification of services and</td>
<td>Mäkelin &amp; Vepsäläinen (1989, 1995)</td>
<td>Service: channel matrix, eight categories of capabilities with different roles</td>
</tr>
<tr>
<td>capabilities</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Specialize</td>
<td>Hagel &amp; Singer (1999)</td>
<td>Unbundle and select between infrastructure, customer or innovation</td>
</tr>
<tr>
<td>Dual strategy</td>
<td>Abell (1993)</td>
<td>Master today, preempt tomorrow</td>
</tr>
<tr>
<td>Bifocal capability</td>
<td>Imparato &amp; Harari (1996)</td>
<td>Manage current activities and jump to the next curve</td>
</tr>
<tr>
<td>Service generalists</td>
<td>Gallouj (2002)</td>
<td>Bundle and recombine</td>
</tr>
<tr>
<td>Ambidexterity</td>
<td>Benner &amp; Tushman (2003), Tushman &amp; O’Reilly (2004), Benner &amp; Tushman (2015)</td>
<td>Manage operations (exploit) and innovation (explore) at the same time, need to progress from firm-centered towards external open innovation</td>
</tr>
<tr>
<td>Value innovation</td>
<td>Kim &amp; Mauborgne (2005)</td>
<td>Lower costs and increase value at the same time, four actions framework</td>
</tr>
<tr>
<td>Second operating system XLR8</td>
<td>Kotter (2012, 2014)</td>
<td>From leading change to acceleration through a dual structure</td>
</tr>
<tr>
<td>Three cylinders of growth</td>
<td>Viguerie, Smit &amp; Baghai (2008)</td>
<td>Existing business, new business, M&amp;As</td>
</tr>
<tr>
<td>Dual transformation</td>
<td>Gilbert, Eyring &amp; Foster (2012); Anthony, Gilbert &amp; Johnson (2017)</td>
<td>Renew legacy, create new and leverage capability synergies</td>
</tr>
<tr>
<td>Digital strategy</td>
<td>Weill &amp; Woerner (2013)</td>
<td>Platform, content and engagement are needed, but no need to excel in all three</td>
</tr>
<tr>
<td>Fit for growth</td>
<td>Caglar, Pandrangi &amp; Plansky (2012), Zook (2001)</td>
<td>Sharpen the role of capabilities, build on strengths</td>
</tr>
<tr>
<td>Bimodal IT, dual speed IT, two-speed IT</td>
<td>Gartner (2014); Westerman, Bonnet &amp; McAfee (2014b); Bossert, Ip &amp; Laartz (2014)</td>
<td>Guidance for managing and organizing corporate IT</td>
</tr>
<tr>
<td>Efficient innovation, hybridization</td>
<td>Sauberschwarz &amp; Weiss (2018); Foster (1986); Suarez, Utterback, von Gruben &amp; Kang (2018)</td>
<td>A method for creating traction and simultaneous customer fit, the hybrid trap of staying close to core</td>
</tr>
<tr>
<td>Institutional entrepreneurship</td>
<td>Henfridsson &amp; Yoo (2014)</td>
<td>Process model for a new but uncertain innovation trajectory coexisting with established trajectories</td>
</tr>
<tr>
<td>A system perspective to ecosystems</td>
<td>Dattée, Alexy &amp; Autio (2018)</td>
<td>Ecosystem design model in an uncertain situation without a clear value proposition</td>
</tr>
</tbody>
</table>

**Table 2-2** Examples of multiple strategies from researchers and consultants.

Dual strategy (Abell 1993) or bifocal capability (Imparato & Harari 1994) mean world class success with two value drivers that have been earlier held as mutually exclusive. Value innovation (Kim & Mauborgne 2005) is the four actions framework (ERRC or eliminate, rise, reduce, create) where value increases and cost decreases at the same time. Dual
transformation (Gilbert, Eyring & Foster 2012; Anthony, Gilbert & Johnson 2017) means to renew legacy and build new growth, mutually independently, but by sharing capabilities.

Kotter saw two paths and two structures as the future of strategy in increasingly dynamic environments. His leading change framework (1996) identified eight phases of change and considered them as more sequential than parallel, and change as less normal than no-change. In his update, the second operating system, change is the new normal rather than an exception. The guiding coalition consists of more people, the phases are parallel, more about engaging than instructing. The accelerators still resemble those of the original leading change model but now circling around what Kotter called the Big Opportunity. He stated on one company: "The inevitable failures of single operating systems hurt us now. I believe they are going to kill us in the future."

During the first Internet boom Hagel & Singer (1999) wrote that one company cannot excel in everything, it has to specialize in infrastructure for scale, customer relations for scope or product innovation for speed. Two first types require a big size, the third consists of smaller firms. Internet made unbundling possible by global networking and lower transaction costs. Willetts (2012) applied this framework for Communication Service Provider (CSP) industry analysis. A variation is the digital strategy of Weill & Woerner (2013) with three arenas: platform, content and engagement. All three are needed, but a company does not need to be leading in all of them.

The service : channel matrix (Mäkelin & Vepsäläinen 1989) described portfolios and dynamics of in-house, networked and self-services. A similar idea was in the framework of capabilities where – instead of unity – capabilities were clustered as a portfolio of leading edge or future, strategic differentiation, competitive necessity, and support, to be managed differently (Mäkelin & Vepsäläinen 1995). Capabilities that are differentiating are few, maybe three or five, and they can be shared across the enterprise, or stay at the business level. Capability roles may switch, as in the mobile industry between core (voice) and context (data). By sharpening priorities, e.g., by outsourcings, resources can be released for differentiation and future. Best businesses operate below their potential as long as management attention focuses to problem businesses or capabilities (Zook 2001) so strengths should be seldom diluted for unity. Another example of this is the fit for growth framework (Caglar, Pandrangi & Plansky 2012).

Gartner presentations (2014) proposed to bifurcate the corporate IT function into bimodal structure, a slow one for platforms, the other and fast for digital businesses. Similar concepts are dual speed IT (Westerman, Bonnet & McAfee 2014b) and two-speed IT (Bossert, Ip & Laartz 2014).

German consultants Sauberschwarz & Weiss (2018) described the efficient innovation as a matrix and a process with both traction close to core and customer fit, combining the resource-based view with customer-centric lean, a hybrid approach (Suarez et al. 2018; Foster 1986).

Henfridsson & Yoo (2014) used the concept of liminality in “... institutional entrepreneurship as the state of ambiguity faced by institutional entrepreneurs when their new possible innovation trajectory is not fully formed but coexists side-by-side with established trajectories”.

Dattée et al. (2018) used system theory to create an ecosystem design model for an uncertain situation without a clear value proposition.
As a summary, earlier multi-strategy frameworks were pretty static or addressed the dynamics in the context of a single enterprise rather than that of new external structures. A paradigm change became obvious in the 2010s. Tilson et al. (2010) and Yoo et al. (2010, 2012) discussed this nascent change and proposed new research agendas. Benner & Tushman (2015), Henfridsson & Yoo (2014) and Dattée et al. (2018) exemplify the research literature.

2.3.4 External sources of dynamics and coherence in the alignment matrix: the strategic attractor

The strategic attractor describes dynamics within the alignment matrix by spins and their clockspeeds, expanding basins (not fixed pools) and coherence. Both networked and algorithmic learning effects amplify expanding positive feedback and feedforward loops.

Chandler (1962) was interpreted that structure follows strategy but he later denied this generalization (1994, 2001). He was known for accentuating clear core arguments (HBS 2007) and in 1962 he described how the decentralized multidivisional structure – the M-form – became the best practice. When corporations grew, their organization and management adapted to the growth. He argued later (1994:268-269) that the diversification movement damaged the long-term health of the companies because it led them to acquire businesses in which they had few if any capabilities to give them competitive advantage. The reasons were that the companies had had little competition before, they were cash-ladden, and they believed that management was a general skill, being told so by academics. Chandler’s The Electronic Century (2001) stressed integrated learning bases that lead to business niches, reversing the strategy to structure causality.

Ansoff (1978) predicted that the reversion of Chandler’s historic causality is a necessity for the future. He defined strategic capability consisting of general management, logistics, technological scope and quality. Strategic fit was the match between strategic thrust and capability. Mintzberg’s strategy emerged out of structure but this relation was reciprocal – “strategy and structure follow each other as the left foot follows the right” (Amburgey & Dacin 1994; Mintzberg, Lampel & Ahlstrand 1998/2005:38). Beer & Nohria (2001) divided the situations into “E” and “O”. “E” (economic value maximization) means top-down management with structures and systems; planned, incentivized, rational, stepwise. “O” (organizational capability building) is a participatory, emergent and cultural process.

In general, structure has followed strategy and vice versa, but slowly and serially like in walking. The new dynamics in the blue expanding zone of the strategy : structure alignment matrix is fast and concurrent. Instead of walking, the new strategy can be illustrated by interacting fractal spins which cross industry and market boundaries, not known in advance, but to be discovered. This swarm generates the new dynamics, also known as zoonosis or cross-fertilization in Internet literature because of crossing boundaries. The number of spins, the clockspeeds, the size of the basin and the strength of the coherence measure the strategic attractor. The ticking of the attractor is the clockspeed which is often preset, e.g., two weeks for sprints, and management guides present detailed prescriptive swarms of nested loops (Gloger 2017, Schrader 2017). Eisenhardt & Brown (1998) defined the rhythm of the business which is set by the leading company. The rhythm keeps the company “on the edge” in a creative and unstable state. The reach of the attractor power field is its basin as the set of values towards which the system tends to evolve. In this context, coherence means right-timing, synchronization and mutual amplification. The more spins, the higher the clockspeed, the wider the basin, the stronger the coherence, the more difficult it is to catch up
and bifurcations do happen, also known as runaways or crossings in Internet literature. This new dynamics is fundamentally different to the punctual inertia and balance of classic strategy.

The strategic attractor in this context comes from the multi-client studies I organized with my team on the Internet in the late 1990s with participating 40 companies. These studies – partly documented in Mäkelin (1998) – analyzed emerging strategies and structures from multiple perspectives using literature, conferences, cases and workshops. New structures were based on decreasing interaction costs, and new dynamics based on positive feedback and feedforward, omens for the beginning of the end for industry and balance, two key concepts in classic strategy. Venture capitalists, entrepreneurs and Kotter (2012, 2014) have used the concept accelerator in this context.

On the left in Figure 2-4, the value chain deconstructs first into a horizontal value system, net, constellation or cluster, then into an ecosystem over a multi-sided platform. On the right is the coeval S-curve dynamics. This results in an attractor measured by the number of spins, their clockspeeds, basin and coherence. The main inspiration to this came from Hagel’s speech at the 1st Virtual Communities Conference in February 1998 together with Armstrong & Hagel (1997:49, 52-53) who identified four spins in the growth of online communities: content attractiveness, member loyalty, member profiles, and transaction offerings. Somewhat similar-looking visualizations by Hurst (1996) and Fine (1998) had different explanations. Hurst’s infinity described eternal change by two mirrored S’s. Fine’s double helix modeled the never-ending fluctuation between vertical and horizontal structures.

Another conclusion from those multi-client studies was that the technology was not yet ready. The spins come from services, access, devices and customers. In 1998, for the purpose of large-scale electronic commerce and multimedia, none of those were on a sufficient level. The multi-client report presented a scenario where the development stalls for one to three years before it restarts, but it did not see that the delay would be ten years. The end of the first Internet financial boom was accurately predicted also by Perkins & Perkins (1999). A familiar pattern; the Internet was overestimated (as a hype) in the short term but underestimated (as a hype) in the long term.
Table 2-3 lists examples of dynamic strategies. Circular transformation frameworks have been common in strategic management literature but restricted to corporate context. Gouillard & Kelly (1995) presented a four-dimensional framework (reframing, restructuring, revitalizing, renewing). Their normative sequence says that the transformation must proceed in one order from setting the vision (reframing) and rotating 360 degrees around the four R-dimensions.

Vollmann (1996) had eight dimensions of change. Vandermerwe (1999) divided dynamics into lock-on versus lock-in. Lock-on meant a positive feedback cycle with complementary offerings and a stream of new players. Lock-in is a mandatory forced dependency on a product, service or provider. In the lock-on scenario value disperses (positive externalities) and profits follow later whereas in the lock-in scenario profits follow fast and concentrate into a control point whose owner has an unproportional negotiation power. Vandermerwe identified six loops that create the lock-on scenario: customer relations, limitless knowledge and intangible resources, networking, actors, developers and complementary offerings, and costs. In the short term, the lock-in scenario may create huge fast profits but she believed that in the long range it is the competitive advantage of the whole ecosystem that counts and the lock-on scenario wins the end game.

<table>
<thead>
<tr>
<th>Concept</th>
<th>Origin</th>
<th>Legend or context</th>
</tr>
</thead>
<tbody>
<tr>
<td>Circular transformation</td>
<td>Gouillard &amp; Kelly (1995)</td>
<td>Four dimensions of change (single company)</td>
</tr>
<tr>
<td>Transformation steps and order</td>
<td>Vollmann (1996)</td>
<td>Eight dimensions of change (single company)</td>
</tr>
<tr>
<td>Online communities</td>
<td>Hagel &amp; Armstrong (1997)</td>
<td>Four spins (many companies)</td>
</tr>
<tr>
<td>Lock-on dynamics</td>
<td>Vandermerwe (1999)</td>
<td>Lock-on vs. lock-in (many companies)</td>
</tr>
<tr>
<td>Flywheel</td>
<td>Collins (2001)</td>
<td>Virtuous circle</td>
</tr>
<tr>
<td>Momentum</td>
<td>Larreche (2008)</td>
<td>Value disciplines form a virtuous cycle (single company)</td>
</tr>
<tr>
<td>Tensions</td>
<td>Boudreau (2010, 2012); Wareham, Fox &amp; Cano Giner (2014)</td>
<td>Hardware developer role, too many complementors decrease attractiveness, tensions as dualities or dualisms</td>
</tr>
<tr>
<td>Virtuous circle of innovation, automation, decisionmaking</td>
<td>Olanrewaju &amp; Willmott (2013)</td>
<td>Digital transformation (single company)</td>
</tr>
<tr>
<td>Collaborative Economy</td>
<td>Owyang (2014, 2016), stock market analysts in the 2010s</td>
<td>Expanding honeycomb of connected industries</td>
</tr>
<tr>
<td>Second operating system XLR8</td>
<td>Kotter (2012, 2014)</td>
<td>Acceleration through a dual structure (single company)</td>
</tr>
<tr>
<td>Cogwheel dynamics and honeycomb structures</td>
<td>Stock market analysts in the 2010s</td>
<td>Growth engines of Internet conglomerates</td>
</tr>
<tr>
<td>Product loop of diffusion, experience and co-creation</td>
<td>Schrader (2017)</td>
<td>Swarm of product loops creates the company transformation</td>
</tr>
<tr>
<td>Velocity in the early phases</td>
<td>Constantindies, Henfridsson &amp; Parker (2018)</td>
<td>Difficulty to catch up</td>
</tr>
</tbody>
</table>

Table 2-3 Examples of dynamics from researchers and consultants.
Collins (2001) described the virtuous cycle by a flywheel. Larreche’s (2008) momentum growth is based on positive feedback between value disciplines: value origination by customer engagements, value capture by ecosystem mobilization and orchestration, and value extraction by efficient scalability. McKinsey’s (Olanrewaju & Willmott 2013) digital transformation is the virtuous circle of innovation, automation and decisionmaking. This circle is like a single spin resembling a rolling snowball. Kotter’s (2014) eight accelerators spin around the Big Opportunity, creating series of wins, but even this is a corporate-level concept except for the guiding coalition.

According to Boudreau (2010), hardware developers accelerate market opening faster than complementary components around the platform. Boudreau (2012) also found that the positive feedback loops and the number of complementors do not perpetuate itself ad infinitum. Too many complementors may discourage from making the investment to join the ecosystem. The market becomes crowded. Wareham, Fox & Cano Giner (2014) detailed ecosystems by identifying tensions which can manifest as complementing dualities or competitive dualisms.

For the context of the telecommunications regulation, Bauer (2014) proposed that dynamic platform market and ecosystem frameworks should be seen as alternatives and expansions to the classic prevailing static equilibrium mental model. Platforms are “examples on general-purpose technologies ... with a high generative potential” and ICT is a complex dynamic and emergent system with multiple dynamic equilibria as attractors. Schultz & Whitt (2016) described the Internet as a complex layered system with a comparison to neoclassical economics.

Stock market analysts have described Internet business models, growth engines and connectivity by cogwheels and honeycombs. A reminiscent micro-level how-to framework is Schrader’s product creation loop (2017) with three vortexes (diffusion, experience, co-creation) so that the emerging swarm of these loops creates the company transformation (2017:174-175).

A pre-emptive strategy – a Boston Consulting Group concept from the 1970s for proactive scaling and jumping ahead in the experience curve – was the overarching goal of the Internet firms of the 1990s with assumptions of “first-mover advantage” and “winner takes it all”. Constantinides et al. (2018) discussed the role of velocity in the early stages of a technology life cycle. Due to the difficulty of catching up, the size and growth of the early user base is an important measure for valuation comparable to traditional revenue, market share, and number of employees.

As in case of the multi-strategy trident, the literature on dynamics shows a paradigm change during the 2010s. Instead of walking sequentially, the interaction of strategy and structure resembles rolling by multiple interacting, parallel and mutually amplifying coherent spins, co-creating scale, scope and speed. This is presented by the strategic attractor with often preset ticking. Technology-related spins are new devices including sensors and actuators, apps, better connectivity, cloud services, datafication, analytics, monetization and value sharing algorithms, and scaling. Other spins (according to the PESTE framework in Chapter 3.1.3) originate from political goals (such as health, education and urbanization), economic trends (such as increased prosperity in emerging markets and contracting middle class in developed markets), demographics (such as the Internet generation and aging in the West, Japan, Korea and China), consumer awareness, values and behavior with co-creation, and environmental challenges.
Already Schumpeter (1942:84) had noted the challenge to conceptualize and operationalize the dynamics and dynamic effects. The increasing role of dynamics is a call for system theoretical frameworks.

2.4 From fractal system theory to the kite

Together with strategy and structure, system is also a hypernym and system theory a key industrial era construct and the third cornerstone in the theoretical foundation of this research. System theory approaches any “thing” as an entirety, and, as a holistic and multidisciplinary concept, a system implies a degree of internal fit because otherwise the construct or phenomenon does not form a system.

2.4.1 “Grand theory”, empirical research and mid-range theories

In Western societies and especially in English-language management literature, the explicit use of system theory for social system analysis has faded in recent decades whereas so-called mid-range theories have become mainstream.

Talcott Parsons’ (1951) functional social system theory was criticized by Robert Merton (1949/1968) as a total “grand theory” missing what I call operationalization. On the other hand, strict empiricism and induction may not lead to a successful theory. Merton (1949/1968) wrote that mid-range “theories ... lie between the minor but necessary working hypotheses that evolve in abundance during day-to-day research and the all-inclusive systemic efforts to develop a unified theory that will explain all the observed uniformities of social behavior, social organization, and social change”. He also argued that hypotheses derived from a master conceptual schema are unimpressive. Based on this reasoning, “grand theories” have been substituted by mid-range theories which became mainstream because of being narrower in scope and more operational.

In addition, Merton (1949/1968) saw mid-range theories as temporal and that there is another trend towards integration, resulting in separation-integration processes: “...gradually consolidates theories of middle range, so that these become special cases of more general formulations”. John Warfield (1976) called such a process Pi-Sigma as the interplay of specialization (Pi, Π, i.e., T with a double leg) and integration (Sigma, Σ) in solving complex problems. Sigma means a summing action where things are brought together whereas Pi indicates that things are separated (Wang & Li 2018:211-215).

For a different reason, Parsons’ biology-influenced functionalism was criticized by von Bertalanffy (1968:196) as missing dynamics and intentionality: “… it overemphasizes maintenance, equilibrium, adjustment, homeostasis, stable institutional structures, ... with the result that history, process, sociocultural change, inner-directed development, etc., are underplayed and, at most appear as ‘deviants’ with a negative value connotation”.

The ecosystem is also literally a biological metaphor. Tegmark (2017) described the difference between biological and social systems as Life 1.0 (adaptation, fit) vis-à-vis 2.0 (cultural learning).

In China, systemic concepts like observability, controllability and stability are sustained and applied (Hvistendahl 2018). Wang & Li (2018) is a Chinese discussion on system theory in management, according to the book, possibly the first such in English. Their social system construct is built on Parsons’ AGIL (Adaptation, Goal attainment, Integration, Latency)
framework so that the original passive and biology-influenced AGIL is modified by replacing Adaptation by conscious Action and by giving the Confucian culture and learning the key role in Latency. Their concept of Engineering is broader and more holistic – i.e., systemic – than that in the process-oriented Reengineering (Hammer & Champy 1993).

System theory comes up explicitly also in German management literature. There are some signs that the English-language literature is attempting to bring the system to back ecosystem (Bauer 2014, Benner & Tushman 2015, Schultze & Whitt 2016, Dattée et al. 2018).

In addition to system theories, there are other everyday examples of concepts, tools and slogans which call for integration and synthesis, such as architecture, boundary spanning, phenomenon-based learning, project work, one-pagers and “breaking the silos”. My research is primarily about the synthesis trend, i.e., the Sigma stage in Warfield’s process. The conclusion from the above discussion is the necessity of operationalization together with explicit dynamics and intentionality instead of adaptation only. On the other hand, I am not aiming at a “grand theory” to substitute mid-range theories, instead, strategy, structure and system are hypernyms with multiple instantiations, they are to bring clarity and simplicity, not to substitute.

2.4.2 The fractal, dynamic and purposeful system

I use fractal system theory to synthesize Schumpeter’s (1912/1934, 1939/1964, 1942) views on nested levels, dynamics and purposeful leadership. To simplify and to restrict the analysis to managerial and social contexts, system theories have advanced in phases: functional (Parsons 1951), general (von Bertalanffy 1968) and ecosystems (Moore 1993, 1996). Based on these objectives, elements and phases, the generic system framework (on the left) in Figure 2-5 is mapped to schools of strategy and management (in the middle) and visualized as the kite strategy map (on the right).

![Figure 2-5](image)

The power of system theory comes from inheritance, i.e., the kite as the “child object” inherits the properties and behaviors of the system “parent object” with rich epistemology. System thinking may help to reveal gaps and holes in empirical research, and even in mid-range theories, “things” that exist but have been omitted, unknown knowns that theoretically (as knowns) exist but have not been detected yet (as unknowns).

The kite with phenomenological and contextual interpretations brings discipline to strategic analysis by four dimensions for schools of strategy and management; resource,

---

24 Here the concepts of child object, parent object and inheritance come from object-oriented programming.
process, customer, and leadership. The kite was originally developed for the Business Transformation multi-client study (1996) and used as the fractal framework for electronic business in digital economy (Mäkelin 1998:192, 273). The term kite comes from the shape and the crossing and spanning rods that could even be of different lengths. Kite also refers to dynamics and winds – originally, it is a Chinese invention with great cultural meaning, “flying away past woes and bringing new hope”.

Based on Table 2-1, classic and new strategies appear either as positions or dynamic patterns in the kite, representing multiple and varying causalities as thrusts, moves, eras and possible turns not directly attributable to a single dimension such as customer or resource. Nothing prevents to use the kite for business models as well as in Mäkelin (1998).

The specifier fractal calls for nested analysis, without a fixed single fractal such as business/corporate, network/industry, or ecosystem, using the same tools if possible. There is no single right level and the kite is expanding from internal to external – from a single business and corporation to networks to ecosystems. For example, if a historic analysis focuses on a corporation it may neglect the big picture, looking at a star, maybe the planets around it, but not at the galactic collision or aliens. This requires a nested system without a predetermined boundary and resolution, in my case study, at industry, market and corporate levels, globally and locally.

Schumpeter (1942) stressed dynamics: “... in dealing with capitalism, we are dealing with an evolutionary process. Capitalism ... is a form or method of economic change ... never ... stationary”. (1942:82). This dynamics is driven by goods, new methods, new markets, new forms of organization (1942:83, 86): “... a theoretical construction that neglects this essential element ... neglects all that is most typically to capitalist ...”. He conceived this process of structural changes being driven by innovation, in his early work led by individual creative entrepreneurs. Later he emphasized institutions predicting that stronger science would make innovation more plannable (1942:132). Schumpeter argued that there is “... no point in appraising performance at a given point of time ... it unfolds over time”. Another Schumpeter’s key argument was (what I call here) fractality (1942:85): “Analysis of what happens in any particular part ... in an individual concern or industry ... may clarify details ... but is inconclusive beyond that.”

When it comes to the dimensions of the kite strategy map, schools of strategy are also called core logics based on the composite principles and premises of strategy theories. To identify such core logics, Lengnick-Hall & Wolff (1999) used Rumelt’s (1979) early test for effective strategy. Sambamurthy, Bharadwaj & Grover (2003) continued by identifying three core logics – positioning, capability leverage and opportunity or entrepreneurial – and used them to (re)conceptualize the role of IT in firms. Given the system theory as the theoretical foundation, these core logics can be conceived and visualized as thrusts shown as arrows on the kite strategy map, originating from customers, resources, and leadership, respectively.

Classic strategy has used three dimensions (generic strategies or value disciplines or perspectives) that were reinterpreted for digitalization by Hagel & Singer (1999; unbundled infrastructure, innovation, customer relationship), Willetts (2012; referring to Hagel & Singer) and Weill & Woerner (2013; platform, content, engagement). Sunzi identified five fundamental factors: moral influence, weather, terrain, command, and doctrine (Griffith 1971:63), Gouillard & Kelly (1995) had four, Amelio & Simon (1996) six, Pascale & Athos (1982) seven, Vollmann (1996) and Peters & Waterman (1982) eight dimensions of change. This justifies to ask whether four is the correct number for dimensions – Kaplan & Norton
(1996:34) answered that "... no mathematical theorem exists that four perspectives are both necessary and sufficient". System theory creates simplicity by dictating that four is a valid number here. These dimensions – leadership, resource, process and customer – differ from the perspectives defined by Kaplan & Norton who outscoped leadership but used the financial model instead.

Concerning the fractality of the system, the role of the corporation vis-à-vis businesses has been discussed in classic strategy literature by, e.g., Porter (1980), Chandler (1994) and Goold, Campbell & Alexander (1994). In The Fractal Enterprise, Warnecke (1993, 1995) focused on the factory level and criticized the original Japanese lean as understating ICT. Much of the Internet business literature since the 1990s has highlighted the ecosystem level. Hoffmeister (2015) discussed fractality in business models and Gloger (2017) as a prerequisite for agile program management offices. In economics, fractality manifests itself in micro to macro models. The evolutionary model of growth stresses technical change and integrates micro level with what goes on the more aggregated level (Nelson & Winter 1982:206). Eliasson (2017) has studied, e.g., public procurement and how it accelerates innovation, with visible costs creating invisible benefits. Porter’s (1990) cluster framework links micro and macro levels as well.

As a summary, the fractal system theory as a first principle – here shown by the four-dimensional kite as the framework for strategy maps and business models – encapsulates Schumpeter’s call for analysis which includes dynamics, leadership and nested levels, such as industry, market and corporation. These issues are broadly and deeply rooted in academic and management literature, and the kite as an inheritor of the system parent object gives the possibility to use the rich system-theoretical epistemology, to be operationalized in Chapter 3.2.

2.5 Summary

Chapter 2 describes the theoretical foundation as strategies, structures and systems going back to Chandler and Schumpeter as well as the initial methodological constructs with a literature review. These constructed frameworks are summarized in Table 2-4.

<table>
<thead>
<tr>
<th>Concept</th>
<th>Propositions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transformation cycle as a circle</td>
<td>The transformation cycle is a descriptive and prescriptive, both a qualitative framework and a quantifiable model or a checklist for decisionmaking.</td>
</tr>
<tr>
<td>Alignment matrix as a square</td>
<td>The alignment matrix between strategy and structure describes the expansion of options with (mis)fits and (in)coherencies.</td>
</tr>
<tr>
<td>Strategic slideruler from classic to new</td>
<td>The slideruler describes the closeness or distance and the alternative value-adding and outflanking routes in the alignment matrix between classic and new strategies and structures.</td>
</tr>
<tr>
<td>Strategic trident with multiple strategies and structures</td>
<td>The trident features the alignment matrix as a portfolio of multiple strategies and structures. The gig spikes classify businesses into existing, new, and mergers and acquisitions.</td>
</tr>
<tr>
<td>Strategic attractor as the generative source of new dynamics</td>
<td>The strategic attractor describes the new dynamics in the alignment matrix with spins, clockspeeds, basins and coherence.</td>
</tr>
<tr>
<td>Kite as a fractal system framework</td>
<td>System theory approaches “things” from multiple dimensions, but as an integrated entirety, highlighting purpose and dynamics. The specifier fractal calls for nested analysis, using same tools at different levels, as long as possible.</td>
</tr>
</tbody>
</table>

Table 2-4 Summary of the initial constructs.
Concerning the strategy: structure alignment matrix, the slideruler describes the closeness or distance from core as well as additive and outflanking routes from classic to new and eventually backwards. The literature on this topic is controversial. Concerning the trident, there has been a paradigm shift from the single company towards a more external perspective of new business creation, actually evolving the trident towards a rake, e.g., digital giants raking money with multiple spikes. Concerning the attractor, a paradigm shift is based on the new dynamics created by spins, clockspeeds, basin and coherence.

Figure 2-6 triangulates the transformation cycle, the alignment matrix and the kite strategy map and their expansion from business/corporation to network/industry and further toward ecosystem where new opportunities and threats emerge from this blue outer space. The circle, square and kite are shown as fractals with example paths for getting things done, routes for transformation, and trajectories of thrusts, moves, eras and possible turns which represent multiple and varying causalities.

Figure 2-6 The fractal triangulation of the transformation cycle, the alignment matrix and the kite strategy map, and their expansion with example paths, routes and trajectories representing multiple and varying causalities.
3 The operationalization of the transformation cycle

The still abstract initial constructs need further operationalization to be usable in the case study. Chapter 3 curates indicators and proxies – conventionally called tools and themes in thematic analysis – for this purpose. The description is counterclockwise 1-2-3-4 in the transformation cycle, starting with insighting followed by strategizing, proceeding to planning and managing, and finally to executing. Historically, analysis and management tools have emerged the other way around so that insighting is the latest step in the century-long sequence 4-3-2-1, these phases timed roughly to 1910-1950-1970-2000. It can be assumed that tools mature with age. The focus of this research is on the two latest steps but the roles of planning and managing and executing are also discussed. Chapter 3 serves as a review and synthesis of much of this literature patchwork so that references are naturally biased towards operationalization. This Chapter 3 with the summary in its end matches Digital Transformation Maturity Model (DTMM) as the checklist and unit of coding as the data that can be assessed in a meaningful way regarding the phenomenon in the case study (Boyatzis 1998:63) and with the explicitly outscoped program, project, and change planning and management.

3.1 Insighting

Four tool(set)s address the epistemological and ontological structural and dynamic aspects in insighting: generations of insighting as staircases, the puzzle of knowns and unknowns, PESTE and Maslow superstacks with megatrends, and the map of business dynamics. When it comes to experimentation as learning, lean together with agile methods can be seen as the fifth insighting tool(set) for path 1-4-1 (insighting to executing and back) but this is discussed later in the context of planning and managing and executing.

Complex dynamics, blurring digital boundaries, combinatorial innovation and external financing without existing portfolio cashcows have built up the role of insighting because of increased and accelerated opportunities and threats. A steady state means marginal or recurrent changes with less or no need for insighting. Complex dynamics resembles a convex fell landscape where paths and targets are invisible and, in the middle of such a landscape, one may not even discern ups and downs. The extreme situation is the so-called whiteout where brains suffer from the lack of any information input and start to create delusions. As the opposite to whiteout, the challenges of information overflow and attention management have been known for decades with proposed solutions (Ettinger 1971, Orman 1984, Cai & Zhang 1996, Davenport & Beck 2001). In some cases, plausible, lucrative and coherent narratives – unfolding and freezing the direction – have created high valuations as measured by stock price per earnings or sales.

The insighting quadrant of the transformation cycle is neither about strategy nor structure – it is about future-oriented cognition and knowledge, about discovering “things”. Some authors have argued that the unknown (Taleb 2007), secret (Thiel & Masters 2014) or knowledge absence (Spender 2014) is critical to strategy. Spender’s (2014) foundation for strategy as “selecting and engaging knowledge absences on which value creation, profit and growth depend” includes what is called insighting here, a historically underestimated
periphery which highlights imagination, surprises and contrarian thinking to the detriment of “rational man” (Simon 1957), adding Schumpeterian entrepreneurship and creative dynamics to strategy.

3.1.1 The generations of insighting

The generations of insighting visualized as staircases are business intelligence, external intelligence, weak signals, and networked and integrated:

− Business intelligence and analytics focus on internal data and Key Performance Indicators (KPI).
− Customer, market, competitor and technology intelligence focus on external data.
− Weak signal(s) is an attention management system for discontinuities and anomalies instead of trends and averages (Ansoff 1978). This resembles Granovetter’s weak tie(s) theory (1973) which says that it is important to be linked to a large number of diverse people (Barabasi 2002:41-44), later implemented by social and work platforms.
− Networked and integrative insighting opens the strategy process through (traditionally) Delphi and other participatory stakeholder and outsider engagement methods, across industry boundaries, with portfolios of experiments, startup collaboration and investments.

The idea of the four generations of insighting as staircases comes from German studies of strategische Frühaufklärung (Roll 2004, Rauscher 2004), blurring the difference between fore- and insighting. Insight often stands for customer or market insight, literally outsight, and Hamel & Prahalad (1994:79) defined industry foresight holistically as a combination of customer benefits, resources and customer interface to achieve intellectual leadership.

Specific tools for external data capture include ethnography and quantitative customer observation, benchmarking, pricing intelligence based on market transparency and dynamics as well as on the use of mobile devices for checking where and when to buy, especially time-dependent energy, traffic and hospitality services, e.g., using Priceline and Expedia service brands.

Weak signals appear in strategic radar as inputs to strategic issue analysis, a flexible approach compared to the strategy processes hardwired to executive calendars. They are offered as a service by linguistic frequency analysis and scouting. Big Data tracks and predicts, e.g., disasters, diseases, news or sentiments. In an unfortunate or out of context, fragmented data, words and sayings, at worst, may deteriorate to meaningless or impenetrable media noise.

Networked and integrative insighting complies with Schumpeter’s views on fractality and dynamics. Zoom-in and zoom-out mean varying boundaries and time horizons. Unfolding events are looked from different distances to spot structures and dynamics. A snapshot or a short time slot may give a chaotic impression. The longitudinal analysis emphasizes thrusts and moves with eras and real or illusory turns.

3.1.2 The puzzle of knowns and unknowns

This puzzle consists of known knowns, unknown knowns, known unknowns and unknown unknowns. The first known or unknown in the pair of words refers to the existence or lack of data, the second known or unknown to the existence or lack of a framework. The puzzle
especially addresses and urges to scan adjacencies, startups and other “things” that are not yet known and emphasizes the methods for discovering what is less obvious (Day & Schoemaker 2006). The puzzle also highlights the framework: what is the interpretation of the data?

The classification of issues into a 2x2 matrix of knowns and unknowns is often attributed to U.S. Secretary of Defense Rumsfeld (2002) but literature traces a similar idea to Confucius (551 - 479 BC). Figure 3-1 illustrates the abductive use of this 2x2 matrix in my case study. In addition to mobile world congress (MWC) themes and corporate event logs, there were things that were not told, i.e., out-of-the-box observations. The framework triangles represent the three fractals, i.e., business/corporate, network/industry, and ecosystem layers. Primary observations were aggregated and the conclusions were either straightforward (up) or needed to construct a “holon” (down) to discuss and eventually confirm them in different fractals.

![Figure 3-1 The 2x2 matrix of unknowns and knowns.](image)

Mistakes can be conceived as the fifth piece in the puzzle: you think you know but you don’t. In literature, radars are focused risk analysis tools, such as Sheffi (2005:25) where radar sectors are financial, strategic, operational and hazard vulnerability. Digital radar (Bouée & Schable 2015) consists of four sectors (networking, datafication, automation and customer connections) and two concentric circles: an inner circle of technological enablers, an outer circle of value propositions. The challenge is whether the radar can detect stealth phenomena.

In general management, solving the puzzle, finding the right questions, the agenda, is attributed to Drucker, but goes back all the way to Taylor (Rumelt 2011:259). Blind spots towards newcomers have been common in digitalization. Emergent and tacit strategies are difficult to spot in time, strategies in use may not be what they are said to be, e.g., in interviews or statements. They must be inferred from scattered pieces, requiring tools such as checklists.

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25 This is a generalization of the Dunning-Kruger Effect (DKE) which says that unskilled people overestimate their own level of ability and knowledge whereas highly knowledgeable people underestimate their relative competence. The two peaks in the Gartner hype curve can be seen as an application of DKE.
Spender (2014) classified unknowns – in his language, knowledge absence – into three categories. *Ignorance* means the lack of objective knowledge which is somewhere there, static, waiting for discovery, such as business intelligence. *Indeterminacy* is the lack of knowledge about others and their responses to our actions, such as customer, market and competitor intelligence. This category of unknowns can be handled by negotiating. *Incommensurability* means fragmentation, misfit and inability to put together different perspectives and types of knowledge into a coherent picture because of talking past each other. Spender (2014:161) associated data with ignorance, meaning with indeterminacy, practice with incommensurability. The epistemology of practice is specific, situated and unique – paying tribute to Schön’s (1984) reflective practitioner. I add to this that system theory is a framework for coping with the incommensurability phenomenon.

Another thread in knowledge management emphasizes collaboration and relations instead of the individual. Stacey, Griffin & Shaw (2000) decentered the individual and rejected the hypothesis of hidden knowledge – it is based on social construction, created and shared in daily processes, especially at boundaries, making boundary spanning important. Knowledge-creating and sharing conversations may not aim or result at consensus; they can be robust, “lemon instead of syrup” (Bossidy & Charam 2002; Foster 1986:214-217), “strong opinions weakly held” (Saffo 2008). Diversity and confrontation can be strengths revealing and challenging groupthink and social cohesion (Stone 2013, Maruyama 1963).

The fallacies and biases of consensus (dominant logic, Prahalad & Bettis 1988) and group decisionmaking have been known for decades. Past success creates the halo effect (Rosenzweig 2007). Markides (2000:29) listed thirty synonyms for beliefs and assumptions. A collective management fashion may mean shared knowledge absence (Roxburgh 2003). The resulting mental models have been argued to be the key reason for failures (Olson & van Bever 2008): management no longer faces the reality which has changed, without telling it, leaving “generals to fight the previous war”.

In my first job in a big consultancy company I was told in rookie training (1981) that mediocrity is good – “do not produce overquality” because it is slow and expensive. The measure for the effectiveness of learning calculates how long it takes and how much it costs to learn 50 % or 80 % of the full 100%. Geoffrey Moore recommended to “go ugly early”. But the non-linearity of knowledge was highlighted by Toffler (1991): the last percent makes the difference. Non-linear and stealth world-class expertise can’t be measured on a one to five scale – it is an unknown like the Google algorithm or the Coca-Cola formula. Thiel & Masters (2014) argued that every firm must have such a secret “thing”, thus an inimitable resource. Startup literature follows Schumpeter by stressing execution to the detriment of ideas. Increasingly, secrets arise through automated learning from the scale and scope of data with algorithms. Non-linearity, secrecy and learning challenge formal competence and knowledge management systems. So does the requirement to support data by a proper framework in the puzzle, i.e., metadata.

### 3.1.3 PESTE and Maslow superstacks with megatrends

Society-level PESTE and individual-level Maslow superstacks (this concept comes from mobile world congress MWC 2012) are ontological and structural approaches to needs and their megatrends. PESTE is a widely used framework which may include L for Legal as PESTEL. Notwithstanding that business media expects regulation to play an increasing role
in the future of digitalization, Legal is left out here because in the retrospective case it was not yet essential. PESTE levels are:

- Politics with regulation has played some role in the transformation of telecommunications and media, but may have a bigger role in Internet of Everything, e.g., in retail and finance, housing, traffic, energy, and health, and the urbanization complex.
- Economics, such as the financial crisis of 2007, the Western middle class contraction and the rise of the emerging markets. Internet consumerization has cut revenues and prices and increased competition.
- Social, such as values and demographics. The 20th century megatrends included urbanization, smaller families, working women and better health – leading to aging – which drove major business breakthroughs.
- Technology, such as mobile broadband and the Internet, cloud services, analytics, artificial intelligence, apps, sensors and actuators together with evolving commerce and payment, traffic and transportation, energy, and health technologies.
- Environment, such as resource and emission limits.

PESTE belongs to the shared heritage of consultancy, comparable to SWOT (Strengths, Weaknesses, Opportunities, Threats) framework. It has many variations and sources, including Katz & Kahn (1966/1978:125). The Maslowian hierarchy is the individual-level counterpart to PESTE.

Internet of Everything addresses PESTE and Maslow superstacks as complexes, i.e., systems of systems. Berner (2004:97-108) noted that the Internet trickles in the Maslowian hierarchy, down from self-actualization, esteem, social and belonging such as self-creation, communication, communities and entertainment, heading towards the complex levels of security, safety and survival, such as retail and finance, housing and hospitality, travel and traffic, energy, work, education, health, everything, in other words, “digital that’s fun to digital that matters” (Frank et al. 2017, Bogers et al. 2018).

PESTE relevance comes from of the prospect of solving social challenges through digitalization. In the recent past, “… the mainstream of innovation in Silicon Valley … has veered toward social networks and Hollywood-style digital media” (The New York Times, Oct. 9, 2010). The trivialization of technology means huge sums are paid and patents granted for tiny ideas, Internet of Silly Things, the expression used at mobile world congress MWC 2015. Solving trivial problems – instead of “things” that matter, or addressing unsolvable, large-scale and wicked problems – is an opportunity for startups to create a bridgehead or to exit. Are digital innovators trying to solve complex and serious issues? Christensen (interview, Bennett 2014) addressed this and explained how disruptions have solved social challenges, they have not always been trivial. Many MWC presentations in the 2010s addressed these challenges, referring to shared co-created value (such as in Haque 2011, Porter & Kramer 2011, Barton 2011) or United Nations goals.

Cross-tabulating the five PESTE levels creates ten megatrend collisions (Lancefield 2014). During the 1900s, many success stories surfed on such megatrends: McDonald’s, Walmart, IKEA, Nike and so on, followed by Internet giants. At MWC 2007, Indian Bharti Airtel CEO Manoj Kohli identified mobility as the megatrend to ride, “next to food”. Business media (2014-2018) has proposed, e.g., Uber, Waymo, AirBnB, Tesla, Spotify and corresponding Chinese companies as new examples, and recognized trends towards platforms and sharing.
### 3.1.4 The map of business dynamics

The inertia of classic strategy as well as the limitations of simple tools such as the maturity and learning curves and the adaptive system were discussed earlier. In organizational studies, punctuated change and equilibrium models are sometimes used, possibly with a reference to complexity theory, with alternating incremental evolution and radical change, which may lead to a bifurcation. A paradigm change in the literature of dynamics was embodied by the strategic attractor in Chapter 2.3.4. The dynamics appears in multiple ways in the transformation cycle, strategy : structure alignment matrix and kite. In Table 3-1, the map of business dynamics as a tool for insighting classifies changes into simple illustrated categories.\(^{26}\)

<table>
<thead>
<tr>
<th>Tool and its thumbnail</th>
<th>Origin</th>
<th>Legend</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shock</td>
<td>Macroeconomics; mathematics; Taleb (2007), G. Friedman (2010, 2011); risk management (Sheffi 2005)</td>
<td>The interconnectivity of everything amplifies surprises the frequency of which is such that – based on the evidence from the first decade of the 2000s – a decade may contain four shocks.</td>
</tr>
<tr>
<td>S-curve pairs</td>
<td>Juglar, Rogers (1962), Bass (1969), Foster (1986), Modis (1998); Geoffrey Moore and other consultants</td>
<td>Series of decadal innovations – such as the cycles of digitalization – shake industries and markets. Moore identified a “bowling alley” and a “chasm” which precede the mass market tornado.</td>
</tr>
<tr>
<td>Fluctuation</td>
<td>Kitchin, Schumpeter (1939, 1942); economics in general</td>
<td>Three-to-five-year Kitchin cycles were important during industrialization.</td>
</tr>
<tr>
<td>-fashion</td>
<td>Chandler (1962), Cyert &amp; March (1963/1992), Herbert Simon, Ricci &amp; Volkmann (2003), Byrne (1986), G. Rifkin (1994)</td>
<td>Chandler wrote that managers follow “the state of administrative art” by imitation rather than responding to their own needs. This can be linked to behaviorism, bounded rationality and adaptive evolution, and management fads. Consumerization follows and creates fashion.</td>
</tr>
<tr>
<td>Quatrals</td>
<td>Chandler (1990), Hess (2010); diverse analysts, consultants, entrepreneurs</td>
<td>Public firms are under the pressure to make the next quarter numbers. Forced short term growth or profit may be good or bad.</td>
</tr>
<tr>
<td>Hype</td>
<td>Gartner Group (Fenn &amp; Raskino 2008), Ricci &amp; Volkmann (2003), Geoffrey Moore, Dunning-Kruger Effect</td>
<td>New things are hailed with publicity and curiosity, then quiet forgotten until they are supposed to slowly take off. But hypotheses may never take off or they may make instant breakthroughs.</td>
</tr>
<tr>
<td>Hockeystick</td>
<td>Gordon Moore, Downes &amp; Mui (1998), Kurzweil (2001), Meeker (2014), Downes &amp; Nunes (2014); diverse writers from Machiavelli’s flood metaphor to current investors and consultants</td>
<td>Many trends are in fact exponential, leading to big bangs or killer apps, not just Moore’s law. Some consumer breakthroughs can be understood as hockeysticks without a dive in the hype curve or a chasm to be crossed. Hockeysticks may emerge out of chaos, lead to a bifurcation, but cool down to S-curves in the later phase.</td>
</tr>
</tbody>
</table>

Table 3-1 The map of business dynamics.

\(^{26}\)This map and the diagrams owe much to my adolescent job as a teacher of system dynamics for control engineering students.
Schumpeter (1942:84) complained the lack of dynamics in economic analyses – “... the usual theorist’s paper ... or government commission report practically never try to see that behavior ...” – because they visualize the administering of existing structures. In operational management, timing received a lot of attention in the late 1980s (Stalk 1988, Stalk & Hout 1990). But – despite Schumpeter, and Drucker’s The Age of Discontinuity (1969) – classic strategy has not much to say about dynamics. Dynamics may be based on assumptions of equilibrium and decreasing returns inside well-defined industries, to be handled by timeless general managerial skills.

An exception was Ansoff (1978) with an engineering rather than an economics or a marketing background. He classified dynamics (turbulence) at five levels – stable, reactive, anticipative, exploring and creative – and wrote that the company and its environment must fit so that the company dynamics matches that of its environment, being higher but not too much higher. Concerning digitalization, the bifurcation with runaway or crossing metaphors without return and without the possibility to catch up is a theme in management literature (e.g., Kurzweil 2001). This is no more about fit to the environment but coherence where spins amplify externally each other due to right-timing and synchronization.

Revolution in interaction is the root cause of increased dynamics (McKinsey: Butler, Hall, Hanna, Mendonca, Auguste, Manyika & Sahay 1997). Positive feedback and feedforward in hyperconnected complexes accelerate learning but increase instability. To manage change and to be agile, one has to understand the whole map of dynamics and the changing directions of causalities under the influence of varying force fields. Is a detected dynamics an irreversible inflection or meaningless but disturbing noise? How to make sense about change? The dynamics is sometimes reduced to ten trends (continuities, based on the number of fingers), permanent fluctuations (ups and downs), recurring S-curves and jumps between them, fashions (what others do) or hockeysticks (belief in endless growth that is expected to continue forever or to start soon).

It may take years to detect that an inflection has occurred. Hyped inflections may turn out to be duds. Alarms may be premature and real inflections pass unnoticed, becoming understood afterwards. Even when an inflection is clear to outsiders, insiders may be in denial if facing reality means delearning. If mental models are tacit and collective they are difficult to express, challenge and discuss, the stubborn ones called ideologies, i.e., intended to support power.

In interpreting the dynamics, big mistakes have been made, destroying careers, firms and fortunes. The decoding of the dynamics answers the question whether and how to act or wait? Noise steals time from what is important. For some, the halo effect as the lure of the past and continuity fascinates (no need to renew, just repeat past actions, “we’ve seen this before”, “let’s wait”), whereas others smell large changes behind the corner (rapid action required, “this time it is different”). Senior management may be populated by box-thinkers with effectiveness instead of creativity mindset causing delays in facing reality. Or maybe they are waiting to retire. In complex and convex situations, experienced people may have a modus operandi, copying the behavior which earlier brought them success. Younger people may believe in fast changes and demand nervous action, or get paralyzed, older ones may wait for the situation to pass over.

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27 Denial (Verleugnung in German) is attributed to Sigmund Freud but it has has older roots. Sunzi advised to hide weaknesses from the enemy – not a long way from denying own weaknesses (Tedlow 2010). In modern business context denialism means groupthink-based inability to face reality.
The lack of dynamics in much of classic strategy and management resonates with technical, biological and natural systems whose “essential variables” (Ashby 1956) must stay inside a certain domain for the system being “healthy”, “normal” or in the “comfort zone”. The narrow and stable system concept was criticized by von Bertalanffy (1968:196). Technical systems are regulated by feedback from performance to goals. Adaptive systems and complexity theories (Benbya & McKelvey 2006) have tried to offer more realistic change models for social systems “on the edge”, popularized in management as confusion (Foster 1986:214-217) followed by a freezing attractor and bifurcation, but with few if any practical answers to the “how” question. Stacey (2012) wrote that managers constantly ask for tools to operationalize the theory of complexity where the emphasis on bottom-up emergence and drifting such as “local interactions and interplay of intentions” conflicts with the purposefulness and potentiality of human behavior and of leading the digital transformation.

3.1.5 Summary

The operationalization of insighting is summarized by generations of insighting, the puzzle of knowns and unknowns, PESTE and Maslow superstacks with megatrends, and the map of business dynamics.

3.2 Strategizing

In the second and strategizing quadrant of the transformation cycle, Strategy : Structure is operationalized as Map : Stack where stack is a common term for multi-level technology-based structures. The matches between maps and stacks – static (mis)fits and dynamic (in)coherencies – are described by the alignment matrix. Maps and stacks are separate entities often managed in different ways in ecosystems – complementary, co-evolving, dynamic, distributed and lean maps over tight and planned, centrally managed external stacks, ”loose and tight”.

3.2.1 Strategy map as a kite

The conclusions from the discussion on system theory as a “grand theory” in Chapter 2.4 are the necessity of operationalization together with explicit dynamics, multiple layers and intentionality instead of adaptation only.

The kite strategy map is redrawn in Figure 3-2 with phenomenological and contextual instantiations and appearances. The kite expands from classic business/corporation (internal red area and dots and arrows) to network/industry (green or yellow) to ecosystem (blue) fractals each with expanding options or threats.
Strategy can be shown as positions with dots and their clusters. In the middle of Figure 3-2, the fractal kite strategy map plots Critical Success Factors (CSF), Critical Business Issues (CBI) and Key Performance Indicators (KPI) as dots. The difference between CSF, CBI and KPI dots is that CBIs form the current and transient short list of business issues, less rigorous than quantified KPIs, more dynamic than permanent CSFs. Imagining dots as stars, they form constellations, they are not separable, but one leads to another, gets enforced or weakened. The current snapshot and short list of dots is the relevance landscape and the permanent locus represents the strategic style (Goold & Campbell 1987). Dot patterns can be used to study relatedness in innovation portfolios and acquisitions. My Balanced Scorecard (BSC, Friedag & Schmidt 2000) described how the BSC can be modified to actual cases and this applies to the kite as well. Datafication has improved the system observability with detailed micro-level and temporary measures.

Alternatively, on the right in Figure 3-2, strategies are described dynamically by arrows which represent multiple and varying causalities as connected dots. The arrows over the kite describe business dynamics as moves, thrusts, eras and possible turns. The concept of thrust was coined by Ansoff (1978) who classified them at five levels – stable, reactive, anticipative, exploring and creative. Move is a basic concept in dynamic strategy. Each arrow is associated with an era and may contain a turn. Moves can point in or out, up or down, they can stay inside the corporation or extend to the middle industry/network layer or the outermost ecosystem layer, as explained by the colors red, green and blue, respectively. The end-to-end journey of a move creates and draws its trajectory in the kite system. What is essential is that the arrows represent a dynamic and fractal view to strategy in systemic context. To simplify, I name all dynamic phenomena – paths in the transformation circle, routes in the strategy: structure alignment matrix, and trajectories in the kite – patterns.

Classic strategy and early business models were static but it is among the key tasks of managers or entrepreneurs to conceive the dynamics and act on it – the essence of capitalism by Schumpeter. According to Kim & Mauborgne (2005:10), “… the strategic move, not the company or the industry, is the right unit of analysis …”. They defined a strategic move as a set of managerial actions and decisions for major market creating offerings. This resembles Biddle’s (2005) modern military theory where “… the unit of analysis … is the operation … a series of interconnected battles resulting from a single prior plan”. In the system-theoretical kite context, the arrows as thrusts, moves, eras and possible turns represent initiatives and

Figure 3-2 Using the kite strategy map with static dots and dynamic arrows representing thrusts, moves, and eras with possible turns.
programs with events and decisions, either planned, in-use or emerging, successes or failures. The arrows resemble programs, projects and tasks in Gantt bar charts except that Gantt charts are always planned, one-way and timed. A common management practice is the breakdown of strategy or transformation to a Gantt format. In the kite, an arrow starts from the leadership, customer, resource, or process corner, goes ahead to another corner, possibly making turns and returning after visiting multiple corners. The arrow may have multiple corners as starts and ends. It may cover fractally business/corporate, network/industry, and Internet spaces. In such a representation, instead of dot positions, the pattern of arrows gives a dynamic view to the strategy. The arrow description is used in the case study diagrams where arrows are numbered and explained with text and time stamps and created by event logging and thematic analysis.

Jaruzelski & Dehoff (2007) classified thrusts into “technology driver” (e.g., Google), “need seeker” (e.g., Apple) and “market reader” (e.g., Microsoft). A long-term kite strategy map – such as the one for the global ICT industry in Figure 5-7 – shows how thrusts like winds change direction, circulate and renew. It has been said that business should not be compared to sports. Business is often win-win, sports is win-lose. Yet the moves on the map resemble the arrows coaches draw on whiteboards, except that the playfield and rules are not given, and players come and go and create new teams. Match fixing is sometimes allowed, sometimes criminalized.

The kite adds leadership and fractality to the DaSilva & Trkman (2014) business model definition “a combination of resources which through transactions generate value for the company and its customers”. Complex adaptive systems (CAS) is a branch of system theory also known as complexity theory. Arthur, Durlauf & Lane (1997) defined CAS by dispersed interaction, absent global controller, cross-cutting hierarchical organization, continual adaptation, perpetual novelty and out-of-equilibrium dynamics. The specifics of CAS were defined by Benbya & McKelvey (2006) by seven first principles: adaptive tension, internal complexity, internal change rate, modular design, positive feedback, multiple causes, and rhythmic alternation of causal dominance. Although I am not explicitly applying CAS or complexity theory as such, these principles – many of those known, discussed and explained in mainstream management and ecosystem literature – are built and operationalized in the triangulated frameworks of circle, square and kite.

As a system, the kite implies a degree of internal fit and fractality expands this to external relations. Fit has been a central and long known concept in strategic and other management literature with multiple classifications and near-synonyms (Venkatraman 1989). Porter (1996) described firms as activity systems with first, second and third order fits, defined as consistent, reinforcing, and optimizing, respectively. The concepts of fit and coherence have been conceived formative for strategy as a holistic discipline.29 These concepts have been used with explicit or tacit differences but here match is conceived as the hypernym, fit as a static consistency, and coherence as a dynamic sync with right-timing and mutual amplification, e.g., like the interference or addition of wave functions, such as laser or spin coherence as the right-timed alignment. Another metaphor is gravity assistance where big

29 E.g., Chandler, Ansoff and Porter. Leinwand & Cesare (2010) defined coherence as the alignment of market position, system of distinctive capabilities and product and service portfolio. This is their basis for essential advantage, an opposite to transitory advantage, and the right to win. Stretch was defined as an antithesis to passive fit by Hamel & Prahalad (1994:158-161). Schallmo et al. (2017:22-24) defined Digital Fit as the second to last and holistic stage of their five-stage model for digital transformation, just before the final stage of implementation, taking into account and matching options, customer needs and internal factors.
objects accelerate or redirect small probes by giving them energy, like a slingshot, in business context, for startups.

The kite serves the orienteering across major schools of strategy and management as a dynamic form-changing tool, not a static criss-cross of rigid one-way causal paths. The pattern of thrusts, moves, eras and possible turns as arrows over the kite describe the system dynamics and draws the trajectory of the transformation as a multi-dimensional and phased 360-degree journey visiting and changing all corners of the kite. Strategy maps or business models are sometimes shown as nomological networks with lawlike strong causalities, such as root cause analyses or those of Sambamurthy et al. (2003) and Benner & Tushman (2003). The kite differs by showing sequential and parallel patterns with multiple, varying and generally weaker causalities.

The leadership dimension of the kite strategy map has theoretical (e.g., Schumpeter, von Bertalanffy), practical and symbolic meaning. It means that people are not mere resources. In my first job in a big consultancy company (1981), the term resource was banned as a passive expression for people. Many digital champions have demonstrated strong leadership which is often personified. Spender (2014) wrote that “... strategy work is the pursuit of the heterogeneity that can lead to profit ... few strategy texts discuss people ...”. Kiechel (2010) discussed people-centricism as a failed paradigm in strategy. He speculated it as the next big thing, signals of it seen in networking, entrepreneurship and private equity. Moore (1996:159) listed the cognitive and cultural shifts required to lead business ecosystems. In Social Systems Engineering, Wang & Li (2018:403-418) accentuated culture as the lateral force in their modification of Parsons’ system framework. Because people are missing from classic strategy, culture and other leadership issues have been separated from strategy. Leadership is described by pyramids or icebergs (Schein 1992/1997:17) where vision and mission tips (artifacts) are visible but other factors (espoused values and underlying assumptions) lurk below sand or waterline, like tombs in a pyramid (to use Schein’s metaphor), not connected to strategy. A saying goes that “culture eats strategy for breakfast”, as in the 7S-model which – when turned upside down – describes how rigid culture and past success decelerate renewal.

The kite was used both as a strategy map and as a business model tool in Internet multi-client studies (Mäkelin 1998). In addition to system theory and, e.g., the works of Kaplan & Norton and Porter, the kite strategy map was inspired by Slywotzky (1995:23). He had written that the new sources of economic discontinuity are business designs that meet customers’ most important priorities. Business designs must answer the key questions about customers and offerings and the way the organization delivers the utility. Soon, the concept of business model became more popular than business design. In a later book, Slywotzky, Morrison, Moser, Mundt & Quella (1999) compared complex strategic patterns to Picasso’s paintings: the patterns can be detected and understood only by zooming in and out, i.e., from different distances, and by recognizing eras, such as blue and rose.

Based on the kite dynamics, the 1998 Internet multi-client report introduced the concepts of dominance and commitment. Dominance was proposed to substitute the first mover advantage and the lock-in exponential growth with a reference to Vollmann (1996) and Tang & Bauer (1995). Internet brands were expected to become more centralized than traditional

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30 7S = Strategy, Structure, System, Skills, Staff, Shared Values. Reportedly created by Peters & Waterman, but first published by Pascale & Athos (1982) who argued that the “soft” factors are more important than the “hard” ones, i.e., strategy, structure and systems.
brands so that few brands will dominate the Internet, as predicted by Morgan Stanley (Meeker & DePuy 1996). Dominance maps to the kite so that operational dominance is about processes and strategic dominance about customers and markets (Mäkelin 1998:273), i.e., the efficiency and monopoly branches in Williamson’s cognitive map of contracts (1985:24). Dominance pertains fractally to a company, a network and an ecosystem, emerging gradually through lasting commitments.

Media was the first industry to transform to “new media” (Hoffman, Novak & Chatterjee 1995; Hoffman & Novak 1996). After the Internet breakthrough, Tapscott (1996) wrote that management is myopic for inward-looking reengineering and quality management to the detriment of the transformation to Digital Economy. Similar criticism appeared two decades years later in Werani et al. (2017:260) comments on the discourse about Industrial Internet – also known as 4.0 and Smart Factory – with one-sided focus on core process management (Management von Schlüsselaktivitäten): “Damit wird allerdings die Diskussion um die digitale Transformation von Geschäftsmodellen in völlig falsche Bahnen gelenkt.”

When Internet of Everything trickles down from communications and media to, e.g., retail and finance, housing and hospitality, traffic and transportation, energy, and health, the issue becomes how to transform from internal process- to external leadership-driven, how to change the thrust and expand the kite inside-out, with new capabilities and new customer needs, from “same but better” to “discovering things”? This theme was discussed by executive-level keynote speakers at mobile world congress MWC 2015. Discovering and serving new customer needs and markets by new capabilities has been a known challenge for strategy during decades, almost a mission impossible, here addressed with the strategic trident. The solution has been to create new businesses on external platforms through distributed and combinatorial innovation (Yoo et al. 2012). In addition, Internet of Things may mean vertically connected products and systems as growth opportunities.

For detailed business and operational models, literature and practice use canvases which effectively use the whole available paper, wall or screen to support groupwork. Business tools were presented by Osterwalder & Pigneur (2010), Maurya (2012), Osterwalder et al. (2014) and Dattée et al. (2018) and checklists thrive in the ever-expanding consulting tool space. For these purposes, the kite can be represented as a canvas together with a separate financial model. However, concerning business and operational modeling, the Communications Service Provider (CSP) industry uses their de facto standard Business Process Framework, historically known as eTOM (enhanced Telecom Operations Map). Because of this similarity in business and operating models, the kite is only used as a strategy map in the case study and the more detailed internal maps are outscoped.

Some practical tools resemble the kite strategy map. The product field (Schrader 2017:137) is a cognitive tool for complex dynamic product creation. It resembles the kite with reminiscent four dimensions, dots and arrows. The literature on the closeness of and relation between strategy maps, business models and transformation was discussed in Chapter 2.1 with references to, e.g., DaSilva & Trkman (2014), Wirtz (2016); Werani et al. (2017) revision

As a summary, the kite frames specific issues by identifying and connecting dots and by visualizing dynamics by patterns. Stakeholders see the map from their own perspectives but as a system the kite is holistic instead of eclectic. It may require a large amount of work to build a 360-degree view and even then it may not be agreed on. When a consensus is reached, someday, it is possibly obsolete.

### 3.2.2 Structure as an architecture and a platform

In the history of information processing, as described and personified by Mayer-Schönberger & Ramge (2017), advances have redefined business and corporate strategies and structures, from bookkeeping (Medici family, 15th century) to cost accounting (Wedgwood, 18th century) to Tayloristic cost managing with one best way, and further to Sloan’s corporate structure at GM, responded by McNamara’s computerization at Ford, to enterprise architectures (EA) and enterprise resource planning (ERP) systems by, e.g., IBM and SAP.

Chandler (1962) had multiple interpretations for his industrial-era internal definition of structure as a hypernym. Representations of structures tend to highlight social organizations but Chandler recognized the role of technology as well. Technology-based structures are often called stacks (for brevity and here for rhyming with maps) and operationalized as architectures with layered modular designs (Yoo et al. 2010). According to Yoo et al. (2010), a layered modular architecture is doubly distributed, firstly because of technology layers and their boundaries, and secondly because of distributed the social control and product knowledge. This encapsulates Kogut’s (2003:16-17) observations of the reasons why Europeans had lost the Internet, i.e., the European framework was based on the two cornerstones of “meter and bill” financial model and centralized planning.34

The concept of architecture comes from product development (Wheelwright & Clark 1992:96), from ICT, and from German management literature. In ICT, architectural frameworks and tools are attributed to Zachman who generalized (1987) IBM’s business system planning methodology from information architecture to strategic planning and general management. German management science makes a difference between Ablauf (process), Aufbau (organization) and Wertschöpfung (value) architectures. Baldwin & Woodard (2009:22-23) described the history of the architecture concept as the means to achieve scale and scope with low costs and evolvability.

The concept of platform in its current abstract meaning comes from the 16th century (Baldwin & Woodard 2009). The concept is fragmented across disciplines, including product development, technology strategy and economics. Even the society can be conceived as a future-proof platform for investments and services. In all incarnations, the goals of platforms are the same: to simplify, have a high option value, be useful in addressing heterogeneous,

34 “This European system failed in wired communications because ... European countries had the technological capability but ... the institutional logic was to develop a network that would permit payments through metering of use, similar to the model of circuit switching ... The American model did not follow a technological blueprint, as in the European case, it emerged within a specific institutional and decentralized context, ... it did not evolve out of hierarchical but rather modular system that focused on common interfaces.”
unpredictable customer needs, attract capital, and provide network externalities (Baldwin & Woodard 2009:34-39). Platform is also a practical instantiation of what economists call general purpose technologies (Bresnahan & Trajtenberg 1995).

Platforms are architectures with some open and well-defined interface layer(s) with control points and boundary resources such as Software Development Kit (SDK), Application Programming Interfaces (APIs) and app stores for internal and external developers or service providers. Platforms are also popular business models. Tiwana, Konsynski & Bush (2010) defined platform architecture as the “... conceptual blueprint that describes how the ecosystem is partitioned into a relatively stable platform and a complementary set of modules that are encouraged to vary, and the design rules binding both”.

The core idea in the service strategy framework and its service : channel matrix (Mäkelin & Vepsäläinen 1989, Apte & Vepsäläinen 1993) is to use transaction cost theory to argue that simple mass services fit for automation and self-service while complex and contingent services create high transaction costs, and need human experts due to hazards of misunderstandings. The service strategy framework as whole consists of two additional matrices for the service and the channel. The service matrix axes are complexity and contingency vis-à-vis customer relationship, classifying services on a continuum between hierarchies and markets. The channel matrix is social organization : technology. The channel matrix follows organization science literature as a framework for socio-technical systems, classifying channels on a continuum between high touch and high tech. Yoo et al. (2010) definition of the doubly distributed structure has a channel matrix parallel in the fit between technological and social structures.

Already in this pre-Internet phase of digitalization, technology was seen as the lead variable and, consequently, social organizations lagged its advances, i.e., social follows technology as in Tilson et al. (2010). Advances in digital technologies have pushed the envelop of what is possible, creating opportunities for flat, open, shared and communicative social structures, both internal “two-pizza” teams and internal and external entrepreneurialism. In addition, complex and contingent automated services are not only possible but they can learn and improve themselves by algorithms.

Sawhney (1998) suggested that managers should move from portfolio thinking to platform thinking, understanding the common strands that tie the firm’s offerings, markets, and processes together, and exploit these commonalities to create growth and variety. Early platformization aimed at extended enterprise architectures for alliances, clusters and value networks such as those described for the automotive industry by Radtke, Abele & Zielke (2004). Gawer & Cusumano (2002) depicted platformization by degrees of product modularity, open or closed interfaces, information disclosure, and as balancing competition and collaboration using, e.g., Intel and Microsoft as cases. O´Reilly (2004/2005) defined Internet 2.0 as the new business platform, i.e., as an external structure.

Multi-sided platforms were conceived as joining customers and partners through digital interfaces to co-create ecosystems and access open data, even uninvitedly and without permission but with varying degrees of quality control, to create human or software services. 

Notwithstanding that the field of research and practice in new structures is nascent and confusing, it is possible to classify stacks from classic to new through the technology lens. In the classic end of the strategic slideruler is the internal and established, closed enterprise architecture (EA) as the integrative corporate stack. In the new end is the still unnamed and emerging “thing” which I call – not trying to invent novel words – the new enterprise
architecture (NEA). This includes external platforms for data, machine connections and intelligence. In-between is the networked extended enterprise architecture (EEA).

The following classification can be made on platforms (own synthesis based on literature):

- A platform can be an internal corporate process, data or product architecture. This is the enterprise architecture (EA) even if the EA concept does not traditionally include products. Historically, companies have tried to close their platforms by fighting against “grey” third party components, often cheap copies, to raise barriers for entry. Robertson & Ulrich (1998) defined platforms as the collection of assets – components, processes, knowledge, people, and relationships – that a set of products share. There are similarities to dominant design (Suarez & Utterback 1995) which was supposed to refocus the competition from design to processes but newer research (Murmann & Frenken 2006) has redefined and broadened the concept of dominant design as a nested hierarchy of technology cycles.

- A platform can support a network such as a supply chain or an industry consortium. This is the extended enterprise architecture (EEA). Planned and controlled industry platforms have been typical to, e.g., telecommunications. An example was the Symbian operating system and more are listed by Gawer & Cusumano (2013:420).

- Consumer as the platform has aroused discussion whether the future is more about vendor than customer relationship management (Searls 2012). Already the early successful Internet services were less about selling than helping customers to buy (Mäkelin 1998). People can make their data available, both behaviors and intents, e.g., in retail and finance, traffic, energy, hospitality, and health, by opt-in consent or opt-out. Besides Internet companies, China’s social credit system is a large-scale initiative to collect consumer and business data. Data may substitute money and enable free consumer services. Digital intermediaries may earn with data which makes the “segment of one” with intelligent learning processes and offerings possible. This belongs to the new enterprise architecture (NEA).

- The multi-sided single-product platform enabled Apple to retake industry leadership in a short time. It outsourced portfolio management and redefined segmentation as a software-based continuous self-service by apps. This increased spins and clockspeeds, widened basin, built coherence, simplified logistic and shelfspace processes, and led to an unstoppable bifurcation with increased value and decreased cost. NEA again. Keystone firms (Iansiti & Levien 2004) are platform leaders (Gawer & Cusumano 2002) but it is possible that there is no clear blueprint for the future ecosystem (Dattée et al. 2018). Venkatraman (2017) divided platform-based ecosystem roles to orchestrators vis-à-vis participants. The threats come from the eventual reverse engineering of the platform (Baldwin & Woodard 2009), from envelopment (Eisenmann et al. 2011) and from forking (Ghazawneh & Henfridsson 2013), i.e., a situation where “a hostile firm, i.e., a forker, bypasses the host's controlling boundary resources and exploits the platform's shared resources, core and complements, to create a competing platform business” (Karhu et al. 2018).

- Market platforms join buyers and sellers (Malone, Yates & Benjamin 1987; Rochet & Tirole 2003; Bauer 2014; Mayer-Schönberger & Ramge 2017) by bypassing traditional intermediaries and creating transparency and liquidity. Price check and customer feedback apps and portals are market-creating platforms which shift power towards customers, lower barriers of entry and devalue branding. Mayer-Schönberger & Ramge
(2017) divided markets to price-versus data-driven and predicted that the latter form ultimately wins, confirming Schumpeter’s (1942:85) view that “... the price variable is ousted from its dominant position”. NEA again. Here the threats come from the eventual disintermediation of the platform (Baldwin & Woodard 2009), envelopment and forking.

In the original meaning, ecosystems were featured by simultaneous complementarity and competition (coopetition, Brandenburger & Nalebuff 1996), expansive dynamics with low barriers and permissionless entry, co-creating expanding customer value, and demanding orchestration. Bauer (2014) made a distinction between platform markets primarily based on economics vis-à-vis ecosystems primarily based on system theory and Schultze & Whitt (2016) discussed the same topic. Platform markets are about competing by marketing, selling and billing with networks for transactions and services whereas ecosystems are more about complementary innovations.

Platforms and ecosystems exist at multiple levels. Platform literature has focused on scale and network effects, e.g., Gawer & Cusumano (2013:417, 428) wrote that “... platforms are distinct in that they are often associated with ‘network effects’: that is, the more users who adopt the platform, the more valuable the platform becomes to the owner and to the users because of growing access to the network of users and often to a growing set of complementary innovations ... Perhaps the most critical distinguishing feature of an industry platform compared to an internal company platform or supply chain is the potential creation of network effects”. The feedback effect due to algorithmic intelligence was emphasized by Mayer-Schönberger & Ramge (2017) who also warned that it accelerates the transition from dominance towards monopolies and may need regulation.

The concept of NEA as described here is in its formative phase. Consultancy companies have envisioned new stacks. An example in Figure 3-3 is modified from Cognizant’s system of intelligence (Frank et al. 2017). Intelligence with datafication makes the difference to the service:channel matrix of the late-1980s so that complex and contingent services may no more escape automation.

<p>| User Experience |</p>
<table>
<thead>
<tr>
<th>New technologies, apps and service design</th>
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<tbody>
<tr>
<td>Artificial Intelligence</td>
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<td>Algorithms, machine learning</td>
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<td>Process Middleware</td>
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<td>Apps, networks</td>
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<td>Software Ecosystem</td>
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<td>APIs to tools &amp; functionality</td>
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<td>Complementaries</td>
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<td>Data</td>
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<td>Legacy systems</td>
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<td>Enterprise Resource Planning (ERP), Customer Relationship Management (CRM)</td>
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<td>Machine to Machine</td>
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<td>and Internet of Things</td>
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<td>Connectivity</td>
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<td>Infrastructure</td>
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<td>Data centers, networks, cloud</td>
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**Figure 3-3** A tentative new enterprise architecture (NEA). Modified from Frank et al. (2017).
IBM\textsuperscript{35} expects that blockchain technology enables new structures in supply chains by linking primary production, transport, manufacturing, warehouses, stores and consumption, together with regulators, finance and insurance. The lower transaction costs of the blockchain technology increase efficiency, speed and transparency, and lead to a structural change depicted in Figure 2-4.

The enterprise architecture (EA) has been an integrative hypernym and toolbox since the 1980s. EA literature comes with formalizations and divides architectures into layers such as infrastructure, applications, transactions, information, business processes and analytics with metrics such as their share of the corporate ICT investment and spend portfolio.\textsuperscript{36} The primary need for this type of EA comes from information, especially customer datafication (Weill & Broadbent 1998; Westerman, Bonnet & McAfee 2014b). Notwithstanding this, Baldwin & Woodard (2009), and Gawer & Cusumano (2013), EA has had a long-time disconnect from the literature on horizontality which has differentiated the “American way” from European planned and more vertical innovation.\textsuperscript{37}

The shift from internal towards external structures simplifies and accelerates businesses. Customer needs are fulfilled more by markets, less by hierarchies. Even small teams can build services over external structures. Business processes and resources can be externalized by X as a Service (XaaS) where acronyms IaaS, PaaS and SaaS mean infrastructure (technology), platform (basic software), and software (application) as a service.

As noted in Chapter 2.2.1, the boundary between map and stack is not stone-carved. Fine (1998) described the cycle between horizontalization and verticalization and Arthur (2009) described how recursive innovation embeds separate products and services into systems as components. In platforms, an analogous strategy is envelopment (Eisenmann et al. 2011). In the early 1990s, the then-leading online platform AOL copied its partners’ businesses. When they found a success on their platform, they sometimes started to compete with a similar service, using their platform as an innovation and testing laboratory. Stone’s (2013) corporate history showed how Amazon built tensions between map (own assortment) and stack (platform for others), with the revenue split 50-50 in 2016, letting the ecosystem compete against Amazon’s own vertical offerings for the sake of customers and to learn new businesses, so that the merchant becomes a middleman threatened by disintermediation (Zhu & Liu 2015). A form of this uses the smartspeaker and the voice platform to take orders for private label and other bulk products. Hotz & Fost (2017) described the relentless Amazonisierung and provided a survival guide for sellers and producers on the platform whereas Parker et al. (2017) discussed this from the platform perspective.

Over the years, the mobile world congress (MWC) discourse showed how the mobile industry was gradually forced to abandon value chains for platforms. Initially, the industry insight was that Internet services move over to 3G and adopt the legacy telco business model, shown by, e.g., EMC’s detailed scenario of the local mobile clusters in 2005, two years before

\begin{itemize}
\item \textsuperscript{35} Company presentations in https://www.ibm.com/blockchain
\item \textsuperscript{36} EA aims at fit between business and technology. Ross, Weill & Robertson (2006) described the EA evolution: “In 1995 we started our study of EA – we just didn’t know it. At the time we thought we were studying information technology transformations. In 1998 we thought we were studying infrastructure transformation. In 2000 it was e-business. But sometime in 2000, we recognized that each of these studies examined basically the same thing: EA.”
\item \textsuperscript{37} Mittelart (2003) described how Information Society initiatives aimed at national (U.S.) or regional (EU) competitive advantages. The U.S. lead in the Internet is the basis of “soft” cultural and economic leadership as well. The U.S. IT industry is the result of free market competition, as survivors of the fittest, whereas the history of telco industry is that of planning, regulation and monopolies.
\end{itemize}
the mobile Internet breakthrough. The opposite happened and the Internet conquered the adjacent mobile. TMForum Newsletter (2014) wrote about that: “So-called over-the-top (OTT) players like Google, Apple, Amazon, Facebook and Netflix originally were seen as ‘the enemy’ by the communications industry. Now in many instances they are partners and share revenues.” iPhone (2007) migrated the Internet to the mobile. In addition to consumer appeal, its success was based on a value proposition for developers, a new deal (Coneybeer, MWC 2011):

- “No need to talk to a telco.
- Standard contract – no need to negotiate.
- Single OS – no need to make different versions.
- App access to all phone sensors.
- Free promotional support, e.g., with advertisement of successful apps.
- For monetization, payment by credit card processing and settlement.
- Immediate global distribution – no need to negotiate.”

The core of this new value proposition was “no need to manage”: bypass planning and managing in the transformation cycle to accelerate development and lower the barriers of entry. A localized go-to-market process takes resources and time. During negotiations and persuasions ideas are copied. Traveling around the globe is costly and slow and telcos are potential competitors to every idea presented to them. Even minor changes and tests due to different versions of the same platform consume scarce time and money. For its fast, clear and straightforward global service – as Coneybeer described it – Apple billed developers a 30% tax on revenue. This value proposition made many users (consumers or firms) to developers (co-creators) and service providers, changing sides on the platform. Developers loved this model which put telcos to a bit pipe. The value proposition attracted startups with young, talented and passionate programmers. Telcos had to drift and go with this because the product as a platform had a high consumer appeal and they did not have anything to substitute it.

All this led to a value migration from Mobile Virtual Network Operator (MVNO) value chains to Over The Top (OTT) ecosystems. In the early 2000s, the regional mobile industry expected to grow by MVNOs as tenants in their networks, as they frequently told at mobile world congresses (MWC). This was the value chain solution for segmentation. MVNOs may have millions of customers (subscribers) but the OTT potential is in billions and the customers do not have to subscribe and commit to Internet services. An example was WhatsApp (acquired by Facebook for $19 B in 2014) where a team of engineers created a global service in a few years’ time (High Scalability Blog 2014), targeting at a core service of mobile operators. An even bigger example is Tencent’s WeChat. “Rich media messaging” was discussed over the years at MWCs but operators were unable to respond to the vaporization of their communication business where their lost yearly revenue was estimated at €40 B (case WhatsApp, Kollmann & Schmidt 2016:86). McKinsey (Meffert & Meffert 2017:138) and Venkatraman (2017:132-133) described how the telecommunication industry lost business opportunities to Internet companies – both the industry role as an orchestrator and even some old core businesses, not only to WhatsApp but to other Internet giants as well – but they also sketched new and still open windows of opportunity.

McKinsey’s pockets of growth portfolio granularity theory (Viguerie, Smit & Baghai 2008) is relevant here because it was used to justify Nokia’s hypersegmentation which is still common in, e.g., automotive, grocery and other classic industries. This theory of
segmentation is built on internal and industry supply chains and architectures. The idea is that fine granularity unlocks growth opportunities but this requires a scale platform, i.e., an enterprise architecture, to avoid alignment traps. The corporation or the industry creates the scale platform and the growth comes from granularity decisions – pockets of growth – by business planning. This requires focus, going to one market or by one product at a time, sequentially step by step like in walking. But the new strategy assumes an external structure for the complementary ecosystem measured by spins, clockspeeds, basins and coherence.

The goals of mass-customization (Davis 1987, Pine 1993) and one-to-one marketing (Peppers & Rogers 1994) were to combine scale, scope and speed but back then the technology was still immature because of internal architectures.

Four examples in different phases of the technology-driven restructuring are television, automotive, mobile and retail industries. Based on market capitalizations partially shown in Figure 1-1, the value migration potential in these is in the range of trillions.

Television is transforming from regional value chains (Plain Old Television System or POTS) towards Internet portals such as Netflix with some own proprietary content, and multi-sided platforms such as YouTube. Adjacent news portals are embracing television, resulting in ubiquitous media, and regional Communication Service Providers (CSP) are diversifying into television with streaming services.

The German auto industry analysis of Radtke et al. (2004) modeled the changing industry stack, Wertschöpfungsarchitektur, and its clustered structure. The future of the auto industry, its emerging ecosystems and business models was the key example of digital transformation in Venkatraman (2017). Silicon Valley tries to restructure the industry with software and Internet, transforming not only the product but R&D, manufacturing, marketing, maintenance and other services, everything (Meeker 2016:137-159), migrating value from hardware (“T” in ICT) through connectivity (“C”, also called telematics) to software (“T” in ICT), e.g., fleet management, ride-hailing, sharing and self-learning driving algorithms. The routes are towards incremental digital value by added intelligence and connectivity, sometimes blamed for overengineering and unused features (omens of coming disruption, according to Christensen) with warnings for hybrid traps, and on the other hand, outflanking to mobility platforms and solutions. But car manufacturers have also invested billions in mobility platforms and solutions.

The weak ecosystem was a factor in the decline of Nokia, BlackBerry and the Japanese electronics industry. Forum Nokia was established in 2002 but its platform was fragmented, cumbersome and understated compared to Nokia’s operational dominance by business infrastructure, alliances and cluster strategy in manufacturing.

In retail, Amazon’s Chief Technology Officer Vogels (2006) described how Amazon platformized itself, transforming from a bookstore to a general retailer and a technology company. Essential was to externalize service interfaces for developers also outside Amazon – small internal and external teams and individuals share the platform for their businesses. This was their new deal preceding that of Apple. Statistics on bankruptcies – “the retail apocalypse” – show how retailers have drifted without understanding how technology changes strategy, structure and systems.
3.2.3 Matching strategy and structure

The alignment matrix in Figure 3-4 describes strategy as a map related to structure as a stack. Because of endless variations in maps and stacks, it is possible to granulate the axes at different levels of resolution for phenomenological reductions and for different contexts and purposes. One such purpose is comparison, i.e., what is the difference and what matters as the essence of strategy. Rather than for absolute and commensurable – measured by some standard – portfolio positions, the preceding service: channel portfolio matrix (1989) was used to discover and highlight differences inside a set of benchmarked alternatives. In cases without any absolute point of reference, comparative analysis as the inductive social science method was discussed by Glaser & Strauss (1967: 21, 204-205) although the need to operationalize strategy frameworks by measurable models is widely recognized today.

Figure 3-4 represents the alignment matrix with the granularity of three: corporation, network, and ecosystem. In comparative analyses, the matrix may look like a ball pit with multiple relative and evolving positions, (mis)fits and (in)coherencies.

![Figure 3-4](image)

**Figure 3-4** The alignment matrix: strategy as a map aligned to structure as a stack with fit and coherence.

3.2.4 Globalization and T-model

The case study in Chapters 4 and 5 requires a discussion on globalization and regionalization, two megatrends of social change (Wang & Li 2018:418-432). In the 1980s, services were defined **gebunden** to boxes, places or people, i.e., local, and despite its inherent globalization, digitalization has not fully thwarted this dependency. Balancing local and global is a known challenge to corporate strategy (Bartlett & Ghoshal 1989/2002). It is especially relevant for Internet of Things because in O2O (Online To Offline), the online “O” is global and fast, the offline “O” is local and slow but may act as a barrier of entry or as a control point, such as the mounting of new devices (sensors and actuators) to houses and cars.

As an auxiliary concept intended to ease discourse, T-model (Leonard-Barton 1994, Hansen 2009b) denotes the balance between shared and global (the horizontal stroke, T-hat) vis-à-vis autonomous and local (the vertical stroke, T-leg). Management systems have different T-shapes with cultural and national variations. Some emphasize local autonomy (strong T-leg)
and some global management (strong T-hat). The first Internet Report (Meeker & DePuy 1996) predicted the emergence of global companies albeit “small as beautiful” was a prevailing idea back then. The prediction came true because of scale effects due to the experience curve with near-zero marginal costs, and networking effects, and feedback effects where algorithms learn from the scale and scope of the data. Scale lowers production costs, networking increases customer value, and feedback improves products and services (Mayer-Schönberger & Ramge 2017).

T-model has been relevant for regional Communication Service Providers (CSP). Ubiquitous broadband networks lowered the barriers for global players benefitting from scale, network and feedback effects. In the history, global content and services were brought to local platforms by “cover versions”, e.g., in news, music and shows. Nokia’s success in the 1990s was based on its global consumer vision on the GSM platform while CSPs took care of local service and billing. Then the global Internet became the open generative platform for free and freemium services migrating value to customers.

The communication technology industry (“CT” in ICT) is global with a handful of big players such as Ericsson, Nokia and Huawei but CSPs (“C” in ICT) have globalized slowly with setbacks. According to mobile world congress MWC 2015, CSP industry’s new focus is in-market consolidation. A small example has been the Finnish market described in Chapter 5.2. A big one was the Japanese market where global Vodafone faced challenges in creating parenting advantages, explained by Gerhard Fasol38 as the result of global management insensitive to local idiosyncrasies. This resulted in the sale of Vodafone’s Japanese country operation to local Softbank. Under the new ownership the business began to flourish. Masayoshi Son, the founder and CEO of Softbank, gave a keynote speech on this case at MWC 2011 and Ted Matsumoto, Senior Executive Vice President of Softbank, presented Softbank’s future visions in detail.

Notwithstanding the seemingly irresistible globalization in biosphere, scientific sphere, econosphere and sociosphere (Wang & Li 2018:419-423), management literature has discussed whether globalization has peaked due to “reshoring” and regionalization so that cities are gaining strength to the detriment of nations, and due to technology investments impacted by local “P” in PESTE, and because of urbanization and local clusters becoming home bases for “the creative class”. The Smart City with traffic innovations has been a big theme at MWCs in the 2010s. This new localization was conceived one of the seven key features of digital disruption by Matzler, Bailom, von den Eichen & Anschober (2016) and “inside economy” (Ramo 2012) concentrates in local issues, looking at the mirror, not only out of the window.

3.2.5 Summary

The frameworks are discussed in a nested way so that formula Strategy : Structure becomes Map : Stack. Fractal maps describe classic vis-à-vis new strategies by dot constellations and by dynamic patterns of arrows. Structures are stacks described as architectures and trending towards open generative platforms with control points and technical and social boundary resources. Also the parallels between strategy : structure vis-à-vis service : channel matrices (1989) are discussed.

38 Gerhard Fasol’s website www.fasol.com
3.3 Planning and managing

Before the breakthrough of strategy, the methodological emphasis was on planning and managing without strategy (Rumelt et al. 1994:19; Kiechel 2010:xii, 28). Strategy was initially conceived as a new approach to planning and policy, adding competition and some dynamics but with a clear line to operations. Rumelt (1974/1986:156) emphasized general managerial skills which were still central to his definition of “good strategy” (2011). These skills were scarce and considered critical in the 1970s when business environment was less dynamic.

Planning and managing tools are mature, widely used but criticized in lean literature for the lack of dynamics, unable to discover “things” which create customer value. Kogut (2003) identified the planning paradigm – together with the legacy “meter and bill” financial model – as the reason for the European backwardness in the global Internet economy. Europeans were technologically advanced but the framework for new strategies and structures remained unknown for them.

Planning and managing were not topics at mobile world congresses (MWC) thus they are outscoped from the case study but discussed here briefly because of their position in the transformation cycle. This explicit pruning does not mean that planning and managing may not have played some role in the case. Bureaucratic overplanning in corporations or chaos in growing firms due to underplanning are issues, and programs and projects may still fail to deliver outputs (cost, time, quality) or outcomes (customer value).

The growth of the scale and scope of digital services highlights future-proof planned and managed stacks. At the same time, lean discovery in maps aims at accelerating, speeding and learning “things”, even by small teams, internally or externally, and possibly automatically. In the planning and managing quadrant the formula Strategy : Structure makes an instantiation now as (lean discovery for maps) : (planning and managing for stacks).

3.3.1 Planning and managing vis-à-vis lean

The paradox of change has been discussed in information systems research as the opposing logics of stability and flexibility and the simultaneous control and generativity (Tilson et al. 2010, Ghazawneh & Henfridsson 2013, Eaton et al. 2015). The transformation cycle positions planning and managing and lean in the same Gearshift Knob diagram as different paths shown in Figure 2-1.

Project and program management office (PMO) best practices, standards and certifications are generally conceived as useful (Jaruzelski et al. 2013). These tools are detailed, productized and measured by maturity levels (usually) between one and five so that service companies may use “certified level five” as their marketing message.

Projects and programs were the first things to learn in my first permanent job in a big consultancy company. Every “thing” started with a project plan by the book. Huge amounts of programs and projects, everywhere. Many a time, even today, an impression is given that this is the only way to go, but the long path 1-2-3-4 (insighting-strategizing-planning and managing-executing) and the shortcuts 1-2-4 (insighting-strategizing-executing) or 1-4-1 (insighting-executing-insighting) co-exist in the transformation cycle. “Things” as services, behaviors and intents as boundary-crossing recombinations may not be discoverable by planning. The need to combine short and long paths is recognized as a major management challenge in corporations and large systems. Proposed both-and solutions include, e.g., Lean
Enterprise (Humble et al. 2014) and agile PMO based on the fractal enterprise concept (Gloger 2017).

In Lean Enterprise (2014), Humble et al. wrapped up that in the past, executing was about “can”, with the focus on planning and managing; now it is about “should”, highlighting executing as discovery where the biggest threat is no more incompetent planning and managing but creating “things” without customer value. In an increasingly dynamic world, the customer voice can be heard by experimenting ex post rather than by fact-based desktop planning ex ante. Overplanning and overmanaging mean lost time and high production, transaction and especially opportunity costs because of the trap of barking up the wrong tree. Notwithstanding this, enterprise-wide management is also needed.

While skillfully skipping much of the planning is an option in the mobile Internet with platforms as open future-proof external structures, it may not yet hold true for Internet of Everything. Immature or non-existent platforms and closed box value chains have delayed the breakthrough by over a decade, even to the 2020s, compared to the hype at the mobile world congress 2001 (then called 3GSM 2001) to be discussed in Chapter 4.3. Not all businesses may be ready for ecosystems with complementors over platforms because there are no platforms.

3.3.2 Planning and managing in industrialization vis-à-vis digitalization

Planning and managing for digitalization differs from that in physical reality. Stacks and especially platforms need centralized planning and managing on the long path 2-3-4 but maps are more about distributed lean discovery on the short path 1-4-1.

The history of civilizations is filled by huge projects that produced amazing constructions from aqueducts to pyramids to cathedrals to road and rail networks. These places and infrastructures were hard essentials and soft symbols for civilizations and economic, military, religious and political power. One asks: how did they do that, without modern planning and managing tools? By interchangeable limitless manpower and ruthless discipline, slavery included.

Adding men and discipline may not help in digitalization. Stacks need careful planning and management, which means that successful platform companies are huge, some near-monopolies, but the discovery of complementary "things" is lean and distributed – combining tight and loose, or chess and poker (Chesbrough 2004, 2005, 2011). In corporations, the coherence between tight stacks and loose maps has been called bimodal, dual or two-speed IT structure (Table 2-2).

In structures, there are more commonalities between digital and physical except that anything digital needs to be future-proof and trustworthy to attract developers, to serve a still unknown basin, connecting people who build their unforeseen applications and services, even uninvitedly and without permission, both to complement and compete. Digital scalability aims at zero marginal costs, low barriers and increasing returns by network and feedback effects.

After validating the map – i.e., customer value and product-market fit –, the top-down view and roadmap are still needed. The so-called technological debt may require to rewrite and optimize the software. In the society at large, the fundamental regulatory framework is a platform but less suitable for experimentation, drifting, wrenching and muddling. One cannot test hypotheses, except by pilots or in special economic zones – according to Wang &
Li (2018), much of China’s success owes to large-scale social and economic experiments instead of big bangs.

Literature describes how industrialization and professional management raised hundreds of millions of people from poverty first in Western Europe and Northern America (Taylor 1911, Ford 1923, Chandler 1962, Sloan 1964, Maddock 2001). Digitalization enables the same for billions a century later, with a tenfold reach of people (scale) and a richer variety of "things" (scope). This creates new planning and managing challenges. In developed economies, digital infrastructures, products and services have taken the leading PESTE role from physical structures, predicted by Toffler (1991) and calculated by El-Darwiche, Singh & Ganediwall (2012). In emerging economies, basic communication services and mobile money have empowered people and entrepreneurship as praised at mobile world congresses (MWC) during the 2010s.

In my first job in project management I was taught that information systems are like houses, roads or plants. Same design methods, similar business. A textbook cover pictured a hammer with nails. Referring again to Lean Enterprise, Humble et al. (2014) argued that this project paradigm is disruption-ready: “... unsuited to rapid innovation cycles ... deeply embedded in the way we manage everything ...”. It is different to discover digital "things" for and with customers compared to managing construction projects. Software allows experimentation, users evaluate it immediately and this is fed back to development. The Columbus effect means that even with a bad map, one can find the new land by sailing, maybe different to the one that was searched for. In addition, a house, road or plant has value when ready. A house can be put on sale, in many cases its value increases over time. People make money in real estate by old, preowned, empty and unused houses, but the value of an old, empty and unused digital construction is negative, it needs to be written off. A house can be built without a clear customer need, the business is about waiting for a buyer or repurposing. Less so in digitalization. The risk of building a house is in resources, on the supply side or “can”, in digitalization much of the risk is in customer value, on the demand side or “should”, in the opposite dimension of the strategy map. Humble et al. (2014) described how high performance organizations design, build and run software-based offerings with a responsibility for customer value. These people may be organized in “two-pizza teams”, a form of lean and fractal organization. Following the subsidiary principle, teams deploy their work to customers, peer-reviewed and/or scientifically tested so that hypotheses substitute requirements. Microservices mean a continuous delivery in small batches which is essential for digital competitiveness.

**3.3.3 Summary**

Chapter 3.3 is a placeholder for planning and managing, a black box with a necessary position in the transformation cycle. A large amount of mature planning and managing literature and a surge of new lean literature address this quadrant or how to circumvent it. The Gearshift Knob diagram in the transformation cycle shows alternative paths, the long and slow 1-2-3-4 (insighting-strategizing-planning and managing-executing), and the short and fast 1-2-4 (insighting-strategizing-executing) or 1-4-1 (insighting-executing-insighting), with the challenge to combine these for strategies and structures.
3.4 Executing

Schumpeter (1912/1934) posited that “... it is not the power of ideas but the power that gets things done”. Classic strategy made a clear difference between what is strategic and what is operational. Given the “thing” as discovery in digital transformation – i.e., what business you are in –, together with the increased dynamics, the borders between insighting, strategizing, planning and managing, and executing blur. The linear 1-2-3-4 paths in the transformation cycle are substituted by the Gearsshift Knob diagram with multiple paths.

The significance of experimentation has been discussed in management literature since the 1950s, and the trap of overplanning, overmanaging and “paralysis by analysis” was confessed and described by, e.g., Gerstner (1973, 2002), Ohmae (1982) and Peters & Waterman (1982). Peters later formulated the slogan “fire! aim”. An opposite to small country wisdom without endless ammunition. Experimentation was conceived as the very key process of digital transformation by Bezos (1999) who was asked how Amazon intents to compete with the big names entering e-commerce. His answer: Stay ahead by hard work, there is no secret formula, if we now have 2 years’ lead, next year we have 2.1 years’ lead, after 2 years we lead by 2.2 years. He also said that we know 2 percent of the e-commerce from what we know after 10 years. These words marked the beginning of the retail revolution by evolution. Later, Amazon experiments were chronicled by Stone (2013) and they are continuously updated by analysts.

In research literature and management guides, experimentation is discussed in the context of agile, design or action design (March & Smith 1995; Sein, Henfridsson, Purao, Rossi & Lindgren 2011), as well as lean, linking insighting to executing and back. These methods have similarities, differences, overlaps and connections. Bloggers discuss the relations and roles of agile (e.g., “how”), design (e.g., “why” for more strategic experiments) and lean (e.g., “what” for more operational experiments) but this discussion outscoped from my research. For clarity and strategic analysis – because lean is the shortest word – the 1-4-1 path is called new lean.

Talent Supply Chain Management (TSCM) has been the traditional way of resourcing – hire, rent, buy or otherwise acquire people – to execute plans by securing the right amount of right competences at the right time in the right places. Next, lean and TSCM together with Kotter’s leading change and acceleration frameworks are positioned in the transformation cycle. Otherwise this quadrant 4 is outscoped as a placeholder.

39 Ohmae (1982:225-227) argued that there is too much corporate strategy and planning which kill entrepreneurship and creativity. Ohmae called “McNamara syndrome” or “von Braun complex” the overvaluation of what is written in books vis-à-vis real life experience: “A great many contemporary corporate problems fall outside the scope of organization or planning in the paperwork sense. Only active and alert organization members, working as an integrated team, can properly address and resolve them.” Elitism had been brought to consultancy by Bruce Henderson who hired bright students (Kiechel 2010), people similar to those attracted by the startup movement a generation later. A counterreaction was the genre of books starting from Peters & Waterman (1982). Ohmae’s focus was the factory floor but the problems of corporate bureaucracy and overplanning were later solved by venturing and startups. Gerstner, Ohmae, Waterman and Peters worked for McKinsey. Kiechel’s (2010) history of strategy describes how Peters and Waterman left the company because their book was controversial to the company approach.

40 Business 2.0, April 1999:68. Amazon had already implemented social recommendation, but had not yet started its platformization.
3.4.1 Talent Supply Chain Management (TSCM)

The path from planning and managing to executing (3-4) is accelerated by TSCM with multiple historic forms and degrees of tightness. TSCM is about executing competence strategies and plans by the right amount of right-skilled people at the right time in the right places to speed the inherently slow human resource processes.\(^{41}\)

Since the early days of ICT and other services, four talent business models have been common: consultancy and innovation competitions and bids (Reichwald & Piller 2006; Reichwald, Meyer, Engelmann & Walcher 2007; Walcher 2006), project and program management offices (PMO)\(^{42}\), precision resourcing by so-called bodyshopping, and micro-work by on-demand task outsourcing. These resemble the archetypes of on-demand talent management identified by Kaganer, Carmel, Hirschheim & Olsen (2013) who named this resource human cloud. Here it is called talent basin because these people may work face-to-face, and competitions are not only on-demand but may happen without permission and uninvitedly.

In traditional hierarchic sourcing, big system integrators face the customer and use second- and third-tier subcontractors with global delivery. Cluster management (instead of ecosystem orchestration) is practiced through frame agreements with negotiated prices, often as low as possible. Everything to be done is planned and managed and invoicing is tied to deliverables. Price or rather the unit price is an issue in choosing consultants so that there is little room for individual capability and performance. Everybody knows that experienced people make the sale for rookies. A challenge of this cluster management is that it may rule out much of innovation.

Employment contracts have been impacted by increasingly specific competences and cost arbitrages (Cappelli 2008; Malone, Laubacher & John 2011). Internet of Everything further increases the complexity and skill requirements when digitalization embeds in products and services. Companies need to define their digital competence and expertise and how they acquire and nurture it. With connected and \textit{gebunden} products and systems, corporations and whole industries meet software-based ecosystems as potential competitors and complementors. Even marquee box manufacturers are exposed to the trap of low-quality software, built slowly and expensively, for their \textit{gebunden} value-added services, documented in business histories as a reason for decline. As a response, corporations have tried to imitate the methods and structures of Google and its peers.

The way of working with big contracts (planning and managing to executing, 3-4) differs from the lean discovery (insightting to executing and back, 1-4-1). In addition, productivity and quality differences between high performance teams vis-à-vis more or less randomly sourced project individuals can be manifold, even infinite. This might escalate into a life and death issue, a pain not only to corporate customers but to system integrators as well.

Kaganer et al. (2013) identified three TSCM trends: workflows merge in-house and outsourced activities, on-call waiting with real-time readiness, and coaching. During the 2000s, internal and external talent markets have started to redefine jobs and employment. There is an on-going discourse on the literally labor market, on the individual as “startup you”, also

\(^{41}\) To a large extent, this Chapter relies on my ten-year experience as an entrepreneur in TSCM.

\(^{42}\) This was the innovation of Bain, a Boston Consulting Group (BCG) spin-off (Kiechel 2010). BCG made reports by talented young researchers. Bain started to sell consultants as managers without detailed plans and sophisticated reports. This meant a different employee profile which locked the firms in their strategies. Today, global firms have mixed customer intervention strategies.
seen in the popularity of talent, work and service platforms. On-call waiting has raised concerns about zero pay contracts. Do they guarantee the best and committed skills, despite that on-demand jobs are popular services? The tightness of jobs can be classified to “earth”, “water” and “air” (Fung, Fung & Wind 2008). Startup literature highlights the negative aspects in using non-committed temporary consultants (e.g., Thiel & Masters 2014) whereas consultancy literature downplays startups (e.g., Schrader 2017; Frank et al. 2017) wishing the comeback of corporate innovation (Sauberschwarz & Weiss 2018).

3.4.2 Experimenting with lean

Lean accelerates and speeds the path 1-4-1 from insighting to executing and back for discovering and delivering “things”. Classic lean targeted at manufacturing excellence but its ancient principle of small steps and continuous improvement without big bangs has been intuitively practiced in retail and services for long. It was the supermarket where Taiichi Ohno – the father of Toyota Production System – got many of his ideas in the 1930s.

Sixty years later, the Internet revolution was lavish and Darwinistic, steps into unknowns. Nobody knew what’s ahead. Every “thing” – from customer needs and segments to business and financial models – became a moving part and these parts had to be moved fast. The cycle insighting to executing and back 1-4-1 became a swarm of nested loops with preset clock-speeds, the rhythm, from intra-day practices to weekly and monthly plans and releases (Gloger 2017:205). Learning happens also algorithmically when products or services are exposed to the scale and scope of data, i.e., to many and distinct situations.

Ohno published his memoirs in 1978, translated in 1993 after Womack, Jones & Roos (1990) had published their study on Japanese car manufacturing. Lean became a near-synonym for Toyota Production System and summaries written in German (Bösenberg & Metzen 1993), English (Liker 2003) and Swedish (Modig & Åhlström 2011) were staunch to the original factory floor scope with adaptations for public administration (Bösenberg & Hauser 1995). Keith Willetts, the co-author of The Lean Communications Provider (1996), discussed later (2012) the ambiguity of lean.43

Documented in the Internet multi-client study report (Mäkelin 1998), back then it was a common belief among marquee market researchers and consultants that incumbent enterprises (their clients) will wipe out weak Internet startups. Taking this into account as well as the lack of venture capital in a small country like Finland, the report suggested that incumbent firms should commit to the Internet to achieve dominance even if there were no visible signs of that. Commitment was necessary due to “things” as discovery and because of dynamics. But instead of corporate innovation, the Internet became dominated first by a smallish number U.S-based and later also Chinese startups. Their methods were summarized in Lean Startup (Ries 2011) which focused on customer value and datafication in entrepreneurial contexts. In this learning method, nothing is sacred: product, channel, value proposal, customer segments, business model, all can be changed. Pivoting means accepting waste by rejecting the work already done. Runway describes the amount of money or time left for takeoff – thus, fail fast. Enterprise lean is about scaling this through organization, leadership and management.

43Lean has meant either meager, agility or quality. Classic lean had a connotation of low tech which was criticized by Warnecke (1993, 1995). In German, lean translates schlank (noun) meaning trim, fast and powerful like an athlete, and verschlanken (verb).
Regardless enterprise or startup context, new lean focuses on software, service and knowledge work. Its differences to discovery-driven growth (McGrath & Macmillan 2009) are in nuances. They both aim more at “right it” (what) than “it right” (how) and focus on “details instead of deals” – even by a degradation to trivialism – different to the “ugly early” of the PC industry and the Internet of the 1990s. The strategic difference and dispute in management guides concerns outside-in (learning from customers and digital giants, Venkatraman 2017) vis-à-vis inside-out (staying close to core and focus incremental revenue, Porter 2001, Sauberschwarz & Weiss 2018) approaches.

Schumpeter (1912/1934) divided innovation in four phases invention, innovation, diffusion and imitation so that diffusion is the most important of those. Available in varieties, the universal innovation framework still contains invention (such as Xerox in the 1970s), innovation proper (such as Apple in the early 1980s and 2000s), and diffusion/imitation (such as Microsoft with Windows in the 1990s, Google with Android in the 2010s). Some varieties of the innovation framework do not make a difference between invention and innovation proper and bundle them as exploration or discovery.

Notwithstanding that innovation processes have been for long classified into customer pull, core or technology push, and interactive, new lean has brought major differences to them. Firstly, in monetization. In the diffusion phase, "things" consumerize and prices drop to a fraction of the original, e.g., to one-hundredth. But if the service is initially free, innovators experiment with monetizing, in contrast to innovation histories in, e.g., Tedlow (1996) and Tellis & Golder (2001). The universal innovation life cycle went from expensive to cheap, business to consumer. The new life cycle often goes from free to monetized, consumer to business. The financial models come after getting developers, service providers and customers, and monetization is a part of discovery. Recall Kogut’s (2003) observation that this was a key factor in the Internet’s victory over the telecommunication industry.

Secondly, lean skips the technology invention and jots to customer fit with tools for human trials, described and developed in blogs and books and supported by software. In innovation, technology (does it work, is it real?) plays a crucial role but lean is close to customer experience management and service design with front-end biases. Sauberschwarz & Weiss (2018) criticized this for neglecting the resource-based view, i.e., the core business as the basis for traction.

Thirdly, when new lean relies on datafication and analytics it declares itself as the new scientific management. But Taylor’s (1911:5) original version included environmental responsibility and with its sole focus on customers lean may be too incremental and feedback-driven to the detriment of more forward-looking market-perceived value (Gale 1994) and intellectual leadership (Hamel & Prahalad 1994).

Fourthly, innovation has been centrifugalized and distributed into ecosystems over platforms with the primary focus on customer value instead of corporate profits (Baldwin & von Hippel 2011, Yoo et al. 2012). This process has raised the importance of business models (West & Bogers 2014).

There has been disconnects in the universal innovation framework as the next phase is different from the previous one. According to Kogut (2003), the secret (difficulty to imitate) of the U.S. innovation system is that the phases have been on different responsibilities with a

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baton forwarding from university research to startups to acquisitions or Initial Public Offerings. The inventors have an opportunity to get rich fast and Internet giants have made a large number of acquisitions. The Japanese innovation system concept from the 1980s was run by “salarimen” in a symbiosis with the state and corporations – following Schumpeter (1942:132) – but Softbank with its Vision Fund (2018) tries to fundamentally change that. The strategy of solving complex multi-disciplinary problems “that matter” by long-term investments in advanced technologies is alive (Kawahara 2014) as corporate innovation different to customer-driven fast startups often focusing on trivial problems by commodity technologies.

According to Global Innovation 1000 surveys, the biggest perceived problems have been in customer-oriented capabilities even if von Hippel in the 1980s had shown that customers are the most important sources of innovations, summarized as “from make and sell to sense and respond”. But despite “the wisdom of crowds”, customers may not know what is possible, good for them or the society. People may drift into their comfort zone, e.g., by not exercising enough, not eating well, not living healthily, not saving energy and other resources. Evolution has favored behaviors and features considered bad and harmful today. Pepsi Challenge (1975) preferred Pepsi in a single sip blind test because it contained more sugar, so-called pleasure trap. Customer tastes based on missing insight, old habits and knowledge absence together with slow corporate processes may lead to problems such as in Nokia’s phone segmentation around 2006 (Chapter 5.4).

3.4.3 Leading and accelerating change

Kotter’s leading change framework (1996) has a strategic background different to the strictly operational lean. Due to increased dynamics, Kotter (2012, 2014) redesigned this framework – renamed acceleration (XLR8) – to include what he called first and second operating systems for the existing business and the new business opportunities, respectively.

The XLR8 framework has some differences to the strategy : structure alignment matrix. First and second operating systems come without the duality of strategy and structure. The accelerators are company-internal, there is no strategic attractor with multiple emerging spins in the expanding corporate-network-ecosystem space.

Management literature has separated “leading change” from “management” as long as change is an exception and no-change is the normal. General managerial skills maintain the current state with Key Performance Indicators (KPI) as “essential variables” (Ashby 1956), “the functional system” (Parsons 1951), “the performance engine” (Govindarajan & Trimble 2010) running smoothly. Leading change literature has been inward-focused with internally operating bosses as heroes but this has changed with high-profile technology company leaders presenting media-intensive outbound visions, “the marketplace of ideas” which deals with the possibilities and future instead of the past image and the existing product features (Ricci & Volkmann 2003:33).

45 Austin & Bradley (2005:ix) scheduled the birth of this slogan to a Harvard 1995 colloquium Sense and Respond – Capturing Value in the Network Era but the idea had been conceived long before the Internet. Lester Wunderman, known as the father of direct marketing, wrote in his autobiography (1996:281) that “… learn to intercept and affect the behavior of consumers no matter how and where they shop … create dialogues between buyers and sellers, and build these dialogues into enduring relationships … based on information exchanged, retained and used collaboratively by consumers and producers of products and services … be increasingly personal, relevant, interactive, measurable, and profitable. Leadership requires constant innovation”. 

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Classic management has considered resistance to change as default. People like biological or technical systems try to maintain the status quo. Scientific and engineering innovations meet resistance (Kuhn 1962/1970) "... but the level of resistance to social knowledge in the modern world is more widespread, deeper, ..., different" (O’Toole 1996:189). O’Toole compared the inertia of elite-led classic management to Plato’s philosopher-led social model.

In economics, Schumpeterian business cycles were deviations from an equilibrium, with “disequilibrium, even turbulence” resulting from innovation (Nelson 1996:95-96). Likewise, early leadership writers discussed feedback and stability. Schön (1971:11) wrote that “... belief in the stable state serves primarily to protect us from apprehension of the threats inherent in the change”. Systems with purpose and in disequilibrium “... develop capacities to shape the environment, creating markets where none existed before” (Wheatley 1992:93) whereas in equilibrium “the sum of influencing forces is zero”. Self-steering, purpose, stretch and disequilibrium, reality distortion, most recently algorithmic learning, all implementing Schumpeterian dynamics as drivers of change make the early slow system models based on reaction, feedback, balance and fit inadequate.

3.4.4 Summary

Executing is scoped to three issues – Talent Supply Chain Management (TSCM), new lean, and internal leading and accelerating change – positioned in the transformation cycle in Figure 3-5.

TSCM as a hierarchy or network (instead of a market or an ecosystem) speeds and accelerates the path 3-4 (planning and managing-executing) in fulfilling business or corporate plans. Lean is for discovering, delivering and maintaining customer value and information-based business models. It speeds and accelerates the shortcut 1-4-1 (insighting-executing-insighting) by swarms of feedback loops with preset clockspeeds, the rhythm, even by algorithmic learning. The new lean differs from the universal innovation model by its late monetization, by skipping the invention, by focusing on customer fit to the detriment of traction, and by its centrifugalization into ecosystems over external platforms. Kotter’s acceleration splits the internal transformation cycle in the north-west to south-east direction. Management guides differ in their focus on additive inside-out vis-à-vis outflanking outside-in strategies and processes.
3.5 Summary

Table 3-2 summarizes the operationalization of the transformation cycle with tools. The literature referred is that discussed in Chapter 3. Table 3-2 corresponds to the Digital Transformation Maturity Model (DTMM) checklist in Figure 2-2 with outscoped program, project, and change planning and management. This checklist is constructed and pruned specifically for the case study and to support the manual and qualitative human interpretation of the sample data. It contains the codebook as “a complex model with themes”, i.e., the patterns of information that are consistently used (Boyatzis 1998:4).

<table>
<thead>
<tr>
<th>Tool</th>
<th>Origin</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Generations of insighting</td>
<td>German academic literature</td>
<td>Insighting consists of four generations visualized as staircases: (1) Business intelligence, (2) external intelligence, (3) weak signals, and (4) networked and integrated.</td>
</tr>
<tr>
<td>(2) Puzzle of knowns and unknowns</td>
<td>Legacy; risk and knowledge management literature</td>
<td>The puzzle of knowns and unknowns addresses adjacencies, startups and other issues – both data and frameworks – that are known or unknown.</td>
</tr>
<tr>
<td>(3) Superstacks with megatrends and collisions</td>
<td>Legacy; academic and consultancy literature</td>
<td>Society-level PESTE and individual-level Maslow superstacks are ontological and structural approaches to needs and their megatrends.</td>
</tr>
<tr>
<td>(4) Map of business dynamics</td>
<td>Own curation and construction from multiple origins</td>
<td>The map of business dynamics is the classification of dynamic phenomena.</td>
</tr>
<tr>
<td>(5) Kite strategy map</td>
<td>Own construction</td>
<td>The kite strategy map describes Critical Success Factors (CSF), Critical Business Issues (CBI) and Key Performance Indicators (KPI) as dots; and business dynamics by thrusts, moves, eras and possible turns.</td>
</tr>
<tr>
<td>(6) Stack</td>
<td>Legacy; technology and strategy literature; own construction</td>
<td>Technology-based structures are stacks operationalized by architectures.</td>
</tr>
<tr>
<td>(7) The alignment matrix</td>
<td>Own construction</td>
<td>Strategies as maps and structures as stacks makes it possible to describe and analyze their (mis)fit and (in)coherence, and expansion.</td>
</tr>
<tr>
<td>(8) Globalization</td>
<td>Legacy; academic and consultancy literature</td>
<td>Balancing local (T-leg) and global (T-hat) often means local strategies (maps) over global structures (stacks).</td>
</tr>
<tr>
<td>(9) Talent Supply Chain Management</td>
<td>Lived experience, own construction</td>
<td>The path 3-4 from planning and managing to executing is accelerated by corporate Talent Supply Chain Management (TSCM) with multiple historic forms and degrees of tightness, and talent markets as the novelty. Basically, hierarchy or network instead of market or ecosystem.</td>
</tr>
<tr>
<td>(10) Lean</td>
<td>Legacy from factory floor to digital services</td>
<td>Internal or external lean speeds and accelerates the path 1-4-1 from insighting to executing and back for discovering “things”. This consists of swarms of nested feedback loops with preset clockspeeds, rhythm, including algorithmic learning.</td>
</tr>
</tbody>
</table>

Table 3-2 Operationalization of the transformation cycle. Legacy means an old and a common practice with many origins and variations.
The case tests the initial methodological constructs – the triangulated frameworks – in the analysis of the evolution and revolution of the mobile industry from 2001 to 2015. Chapter 4 leans heavily on visits to 12 mobile world congresses but – by fourth generation networked and integrative insighting – links this content and data to related developments, “outsight-things”.

These annual congresses in Barcelona in February (the traditional event) and in Shanghai in July (the newer Asian counterpart) are the annual main happenings of the mobile industry, Barcelona grown to over 100 000 global participants. They are the yearly focus of trade media and referred in books (Sandelin & Partanen 2015, Lindén 2015, McNish & Silcoff 2015, Siilasmaa 2018) as important events. Figure 4-1 illustrates their growth from the Cannes film festival Palais des Festivals et des Congrès first to the old Barcelona Montjuïc congress center and – after this got overcrowded – to the 240 000 sq. meter Gran Via drawn by architect Toyo Ito, “The Mobile Capital of the World”, and further to the summer congress in Shanghai.

For the sake of brevity, I use the generic name MWC for literally mobile world congresses (organized by GSMA, this name was taken into use in 2007) as well as for their predecessors 3GSMs (this name was used up to 2006), their U.S. counterparts CTIAs (by Computer Telephony Industry Association), one TeleManagement World (by TM Forum industry association), and Mobile Expo Asia (by GSMA, renamed as MWC Asia in 2015). Of these 12 congresses, nine were “true” MWCs or their direct predecessors and three were similar complementary global events organized by other but related industry associations.

Chapter 4 starts with the description of data gathering and analysis methods, then proceeds to observations on the industry dynamics and descriptions of the eras, i.e., “showing”. The results are presented by Digital Transformation Maturity Model (DTMM) checklist. The preliminary and hypothesized strategy: structure alignment matrix is sketched and
explained. This first round of the fractal iteration leaves gaps to fill and calls for the confirmation of findings and hypotheses with in-depth analyses with kite strategy maps in Chapter 5.

4.1 The data gathering and analysis

The fourth generation insighting requires that in order to understand chaos and complexity, one has to look at the history and the prevailing assumptions and beliefs, including the fractal business dynamics with patterns of paths, routes and trajectories. Zooming in and out means to look at the issues from different distances.

4.1.1 The data and speakers

I documented over 500 company presentations or panel discussions from the visited mobile world congresses. The archived material summarized in Table 4-1 consists of 512 pages of detailed unpublished personal and self-written reports.

<table>
<thead>
<tr>
<th>Event</th>
<th>Archived content measures</th>
<th>Summary of observations in archived content</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cannes 2001</td>
<td>30 presentations + panel discussions, 28 pages</td>
<td>Docomo iMode the star of the show. 15 key themes with Location-based Systems and Services (LBS) and Machine To Machine (M2M) hyps. Globalization and the coming of the emerging markets. The delay of 3G consumer services now apparent.</td>
</tr>
<tr>
<td>Cannes 2003</td>
<td>No archived own report</td>
<td>Only media coverage documentation.</td>
</tr>
<tr>
<td>CTIA New Orleans 2003</td>
<td>20 presentations, 25 pages</td>
<td>U.S. focus without a global perspective. Expensive Wi-Fi connection and forbidden photography at the venue as symbols of industry attitudes. Camera phones hyped but I was asked to put away my camera.</td>
</tr>
<tr>
<td>TeleManagement World Dallas 2005</td>
<td>30 presentations + panel discussions, 42 pages</td>
<td>Single focus on one company enterprise architecture in the anticipation of convergence. Industry insight that Communication Service Providers (CSP) and their regional service delivery platforms (SDP) deliver the future consumer services.</td>
</tr>
<tr>
<td>Barcelona 2006</td>
<td>56 presentations + panel discussions, 86 pages</td>
<td>Failed mobile service development apparent vis-à-vis the simultaneous tornado in the broadband Internet. Confusion predicts discontinuity. My conclusion that the mobile industry lacks a freezing attractor (direction) and is “on the edge”.</td>
</tr>
<tr>
<td>CTIA Las Vegas 2006</td>
<td>42 presentations + panel discussions, 32 pages</td>
<td>Still old school and U.S.-centric. Future mobility not a silo but converges with broadband. Big traditional media introduced as the friend of the mobile industry vis-à-vis Internet enemies. Expectation that the next five years will be vibrant after the “service break” of 2001-2005.</td>
</tr>
<tr>
<td>Barcelona 2007</td>
<td>53 presentations + panel discussions, 74 pages</td>
<td>Confession of the Internet as the winner in Vodafone’s (then-biggest Communication Service Provider) CEO keynote speech.</td>
</tr>
<tr>
<td>Barcelona 2011</td>
<td>63 presentations + panel discussions, 86 pages</td>
<td>Internet as the new normal: from “connecting people” to “connecting the world to the Internet”. USA the new lead market, Europe fallen behind. The new leaders from outside the mobile industry.</td>
</tr>
<tr>
<td>Barcelona 2012</td>
<td>66 presentations + panel discussions, 57 pages</td>
<td>Digital transformation in retail, finance, real estate and hospitality, traffic and travel, energy, education and health.</td>
</tr>
<tr>
<td>MEA Shanghai 2012</td>
<td>44 presentations + panel discussions, 2 pages</td>
<td>Geographical value migration: the on-going and unstoppable rise of Asia Pacific to the top of the mobile Internet.</td>
</tr>
<tr>
<td>Barcelona 2013</td>
<td>76 presentations + panel discussions, 50 pages</td>
<td>Digital transformation in retail, finance, real estate and hospitality, traffic and travel, energy, education and health.</td>
</tr>
<tr>
<td>Shanghai 2015</td>
<td>42 presentations + panel discussions, 30 pages</td>
<td>Mobile Unlimited: emerging market basic connectivity and financial services, especially Digital Commerce with payment focus, Smart Retail as a hybrid, and Internet of Things on developed markets.</td>
</tr>
</tbody>
</table>

Table 4-1 The list of the archived self-written mobile world congress documentation.
I also took thousands of photos and collected relevant brochures and PDF handouts. The number of company presentations and panel discussions is not exact because I often hopped between parallel sessions but the documentation describes what I considered worthwhile enough to write down at that time.

At MEA 2012, the number of presentations (44) is the number of presenter PDFs shared with congress participants. As to other events, few presenter decks were shared but (after mobile phone cameras got good enough) I photographed the key slides. In addition to the visits and documents listed in Table 4-1, I read through the materials of MWC 2014 and 2015 Barcelona to the extent they became available on the Internet.

Due to the heterogeneity of the material and presenters, it was not possible to log formative events with universal time stamps. Different markets had different maturities and agendas – the big events were the congresses themselves. Instead of event logging, I followed selected principles of discourse analysis although not this method as such. A discourse refers to a “set of meanings, metaphors, representations, images, stories, statements and so on that in some way together produce a particular version of the events” (Burr 2003:64). I listened and recorded (in writing and/or photographing) the speeches and slides of speakers who I supposed to represent trendsetters or lead markets. The firms at mobile world congresses consisted of leading developed and emerging markets telcos (Communication Service Providers, CSP), media, network element providers (communication technology, CT), information technology (IT), software and Internet firms and consultants, such as those in Table 4-2. Some firms are duplicates due to corporate and business presentations, some developed market telcos have businesses in emerging markets, e.g., Telefonica in Latin America and Telenor in Asia. I assume this knowledge base was broad and deep enough to reveal the beliefs and assumptions in "the marketplace of ideas" (Ricci & Volkmann 2003:33).

<table>
<thead>
<tr>
<th>Developed markets telcos (19)</th>
<th>Emerging markets telcos (6)</th>
<th>Media (9)</th>
<th>Network element providers (7)</th>
<th>IT, software and consulting (15)</th>
</tr>
</thead>
<tbody>
<tr>
<td>British Telecom</td>
<td>Celtel (Africa)</td>
<td>AOL (Internet)</td>
<td>Alcatel</td>
<td>Accenture</td>
</tr>
<tr>
<td>Cbeyond</td>
<td>China Mobile</td>
<td>BET (Viacom)</td>
<td>Cisco</td>
<td>Deloitte</td>
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<td>Cinquantar</td>
<td>Egypt</td>
<td>CBS</td>
<td>Ericsson</td>
<td>EDS</td>
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<tr>
<td>EarthLink</td>
<td>Pak Telecom</td>
<td>Endemol</td>
<td>Lucent</td>
<td>EMC</td>
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<tr>
<td>E-Mobile (Japan)</td>
<td>Mobile (Pakistan)</td>
<td>ESPN</td>
<td>Motorola</td>
<td>IBM</td>
</tr>
<tr>
<td>E-Plus (KPN)</td>
<td>Telefonica</td>
<td>Disney</td>
<td>Nokia</td>
<td>Intel</td>
</tr>
<tr>
<td>NTT DoCoMo</td>
<td>Telenor</td>
<td>Fremantle</td>
<td>Siemens</td>
<td>LG (Korea)</td>
</tr>
<tr>
<td>Orange (France Telecom)</td>
<td></td>
<td>Media</td>
<td></td>
<td>Logica GMC</td>
</tr>
<tr>
<td>O2 (Telefonica)</td>
<td></td>
<td>MTV (Viacom)</td>
<td></td>
<td>Microsoft</td>
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<tr>
<td>Rogers (Canada)</td>
<td></td>
<td>Time-Warner</td>
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<td>Oracle</td>
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<tr>
<td>Sprint/Nextel</td>
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<td></td>
<td>PWC</td>
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<td>Telecom Italia</td>
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<td>Satya</td>
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<tr>
<td>Telefonica</td>
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<td>Tata</td>
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<td>Telenor</td>
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<td>Verisign</td>
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<td>Telstra</td>
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<td>TeliaSonera</td>
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<td>T-Mobile</td>
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<td>Verizon</td>
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<td>Vodafone</td>
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</tbody>
</table>

Table 4-2 Example list of companies from year 2006.

Positioning is the practice of locating oneself or others as particular kinds of people through one’s speech acts (Burr 2003:111). Speech acts view language functional rather than
descriptive (Burr 2003:58). Due to the positions of people representing mostly incumbent and powerful players, industry gatherings may have a tendency to consensus and/or to downplay peripheral visions and weak signals, including adjacents and startups, as mobile industry predecessors did in the mid-1990s and early-1980s when the digitalization cycles of the Internet and PC industry unfolded.

Agency is the capacity to make choices and act upon them. Its opposite is determinism where individuals have no capacity to bring about the change (Burr 2003:23). Industry gatherings as information sources are characterized by optimism and push and the participants may have an agenda behind their speech acts. In economics, agency costs are based on information asymmetry between seller (or speaker) and buyer (or listener). The moral hazard problem arises if the listener is not able to verify the speech. In addition, a sort of showmanship has developed into the high-tech industry (Ricci & Volkmann 2003).

The MWC speakers did not represent positions in any single organization but came from a blurred and evolving industry and market, some adjacencies and startups included. The selection process of a global conference aims at guaranteeing the quality of speakers who were leaders of globally or regionally important firms or otherwise supposed to have something relevant to say. Each year, I tried to select and listen to as many speakers as possible. Due to adjacency and startup issues, it was important not only who spoke but who were absent, the unknowns. Up to 2015, Google’s then-CEO Eric Schmidt was twice a keynote speaker but Apple was absent. The participants reflected prevailing power relations with shifts first from European and Japanese lead markets to emerging markets as the sources of expected growth (extrapolating what had happened in lead markets in the 1990s) and then to U.S.-based and Asian mobile Internet innovators in the 2010s.

The data gathering resembled tightrope walking. On one side was the highly inductive discourse where the amount of material was overwhelming. I planned in advance whom to listen, but with the exception of the keynote speeches given by the most prominent industry leaders (which I listened all), the selection was not objective in any statistical sense, it was guided by insight, based on professional experience (Klein & Rowe 2008), sometimes the long tail or future instead of the bell curve. For instance, in 2015, I was interested in what big players have to say about Internet of Things. On the other side of the rope were the Internet experiences, coeval events with existing and nascent interpretative theories, frameworks and tools.

MWCs are well-covered in business and ICT trade media as yearly key events. However, they are complex happenings with multiple realities and simultaneous tracks. I discard secondhand media reporting as a source because of its bias towards device launches and isolated speeches of dignitaries. Many a time, when reading from these events, I wondered whether I had been in the same congress. For some visitors, MWC is the key entertainment and public relations happening of the year, and for meeting people, as chronicled by Sandelin & Partanen (2015), Lindén (2015) and McNish & Silcoff (2015). I seldom participated in restaurant gatherings but spent the days from early mornings to late evenings in trying to listen to speeches and panels, to document what was being said, and to put that in a bigger picture.

An alternative method of data collection could have been interviews of company executives, other stakeholders and analysts. This would restrict the method to one company, or as in benchmarking, to a few companies. This would have violated the boundary choices described in Chapter 1.3.3. In addition, this would have been slow, expensive and many would have
denied access by not giving interviews and it would have been anyway impossible to interview over 500 global key people over a long time period.

4.1.2 The analysis

I studied speeches, slides and texts to reveal the assumptions and beliefs in them or the linguistic and rhetorical devices used in their construction. Unlike the formal discourse analysis, which limits to language and talk, my approach is ontological and realistic in the sense that – based on my consultancy career – I assumed an external, non-linguistic world outside speeches, slides and texts.\(^{46}\) For this purpose, I used adjacent, startup and customer experiences ranging from Internet studies to earlier and coeval events and interpretations.

Constructivism emphasizes interaction and relationships, social capital, networking and learning to the detriment of tacit individual knowledge emergence (Stacey et al. 2000). It sees people as having active roles in the creation of their experiences; people perceive the world differently and create their own meanings from chains of events. Constructivism builds the reality and tries to make sense (Weick 1995) from interactions, including communities of practice (Wenger 1998) and unknowns such as Granovetter’s weak links and Ansoff’s weak signals. Today weak links and signals often emanate from Internet communities, blogs and crowds but I assume global conferences with key industry speakers, backed by their businesses, with carefully prepared presentations and panel discussions to be less noisy than social media.

Already in the congress halls, in the hotel during the evenings and next week at home, I summarized the congress discourse together with simultaneous out-of-the-box phenomena and trends into a few key themes, and tried to detect possible changes in these themes in time. I chronicled the themes (called storylines in formal discourse analysis as expressions of assumptions and beliefs) trying to construct the mobile industry narrative. I added complementary sources – such as Internet, literature, peer and client discussions – to zoom in and out to the themes that popped up, and used lived experience, theories and methods to make sense and (re)construct the themes in iterations. This is the substantial knowledge which is essential in assessing digital innovations (Nylén & Holmström 2015), the knowledge which gives the theoretical sensitivity to recognize what is important, give it a meaning, and conceptualize it (Boyatzis 1998:8). In some instances, this type of analysis blurs the “show” (sea of facts or observations) and “tell” (interpretation given to those) aspects of the narrative. In Chapter 4, the themes which come from the real-time local observations in situ and gemba – “show” – are not the themes that are used in the theory-driven thematic analysis – “tell” – in the summary Chapter 4.5. Here, “show” includes pointwise discrete valuations of singular observations made in situ and gemba whereas “tell” is reserved for the retrospective holistic framing.

Balancing between the sea of bits and pieces vis-à-vis forcing and synthesizing them to a big picture was a subjective but transparent effort due to explicit tools. Another visitor would have written a different report with different emphases but this does not mean my way of doing this is irreproducible given the same data, frameworks and tools.

This method is exploring in Ansoff’s five-level (stable, reactive, anticipative, exploring, creative) categorization. This also means that even anecdotal evidence and rare cases play a

\(^{46}\) Different approach compared to, e.g., Korpela (2013), Täuscher et al. (2017:187) and Reeves (2017).
role in revealing unknowns beyond obvious or current expectations and satisfaction. This type of approach is widely but unconsciously used by managers and firms but the problem is its softness. It requires strong frameworks to organize the discourse fragments to make sense.

History research appreciates firsthand sources written as near the events as possible. The following text is partly written in real-time between 2001 and 2015, in situ and gemba as the reality unfolded and things emerged, but edited afterwards for this thesis. I have italicized the remaining pieces of the original raw text to highlight it from the text written later. Texts from different instances of time may contain different writings, e.g., Docomo versus DoCoMo, or teleoperator, telco, carrier versus Communication Service Provider (CSP) which mean the same. Even the names of some companies have changed.

4.2 The years 2001 to 2005 – the Internet as the unknown

4.2.1 Themes and narratives

The speaker positions were executives in large incumbent companies such as Nokia, Sony, HP, Docomo, Vodafone, Sonera, Nordea, Motorola, Texas Instruments, Intel, Qualcomm, Microsoft and Symbol representing Northern Europe, Japan and (especially at CTIAs) the U.S.

In 2001, I identified 15 specific conference and exhibition themes: mobile commerce/payments, mobile ads, Location-Based Services (LBS), music, photography, games, news and information, sports, communities, home automation and Machine To Machine (M2M), Mobile Virtual Network Operators (MVNO), portals, multi-channel services and B2B, business processes and B2B, and Personal Digital Assistants (PDA). Together these themes formed the industry narrative of mobile services as value-added data based on multi-media phones and metered and billed by operator-controlled road toll financial models. Due to phaseshifts between market maturities, the exact timing of these themes remained fuzzy but I picked up LBS and M2M as then-prevailing hypes. The second narrative in 2001-2005 was the coming of the emerging markets and the third was the continued focus on internal processes and one company enterprise architecture (EA) as the single key topic at TeleManagement World.

My summary was: “The high growth during the late 1990s was caused by three simultaneous Juglar cycles (S-curves) in tornado phases: basic IT & IS due to Y2K (year 2000), GSM-based mobile voice, and PC-based dial-up Internet. Now these three cycles have either passed or are approaching saturation. Information technology and telecommunication industries are again approaching a major new growth wave. This next wave is based on always-on broadband wireless access. We are currently stuck between S-curves. The question is, how long does the discontinuity last, and when does the new growth start? It is not possible that every idea presented during the last 25 years ... suddenly realizes itself in two to three years.”

4.2.2 Internet understatement and classic strategy

From 2001 to 2005 the Internet was denied at MWCs. To understand this situation, the assumptions and beliefs of this era must be recalled. Krugman (1998) and – after the dotcom
crash – Porter (2001) had denied the Internet: it is an enabling technology which does not change strategic thinking and firms should go back to basics and forget business models. Doz & Hamel (1998) had written that ecosystems are of little value.

Zoom to other incidences back then: Finnish Sonera decided to merge with Swedish Telia (formally, Dec. 9, 2002). Local Communication Service Providers (CSP) estimated that the average mobile user spends four minutes a day for value-added services, consuming one megabyte of precious data in a month. These parameters were the basis of GSM road toll data pricing.

At MWCs as well as in coeval studies, the mobile industry was conceptualized as a value chain or a cluster, as a voice-based box and pipe industry, with value-added services as content for extra income, and local telcos owning the customers and extracting value from them as gatekeepers, while other industries delivered billable content and services through telcos.

The mobile industry did not care about the Internet. Why should they? Their business was big and doing fine. Elsewhere, since the mid-1990s, a new and a completely different thinking had emerged with new dynamic strategies, structures and systems, as summarized by, e.g., the data-based Internet Report (Meeker & De Puy 1996) and the framework-oriented Internet multi-client report (Mäkelin 1998).

4.2.3 Multi-media phones enter the markets using iMode as the paragon

Japan was the paragon and harbinger for the mobile industry. I photographed lots of Japanese iMode multi-media phones in Cannes 2001 and wrote that “... NTT DoCoMo stand was the most crowded during the conference. The Japanese were the stars of the show. You could feel their proud. NTT DoCoMo CEO Keiji Tachikawa was a keynote speaker. He saw the coming voice saturation, ‘talk is cheap’, and the necessity to jump into the mobile multi-media. NTT DoCoMo’s slides showed no delay between the voice and multi-media S-curves. 50 % from NTT DoCoMo revenue in 2005 comes from non-voice increasing to 70 to 80 % in 2010.”

A fast-forward with a status update from 2013 showed that the Docomo’s non-voice revenue had grown to 57,5 % which was higher than in other corresponding countries and enterprises (Kato 2012, 2013). The centralized Japanese business model had sustained as distinctive. Docomo vision 2015 was Shaping a Smart Life where it is important to note the words “shaping”, “smart” and “life”, but not “connected”. This vision included three areas: convenience/efficiency/fulfillment, security/safety, and enjoyment/pleasure. An example was Nottv launched in April 2012 as an integrated digital media service for tablets and smartphones.

47 Leppävuori & Kiuru (2001:32-33). In 2016, the average Finnish mobile data usage had grown to 16000 megabytes in a month.


49 In this formulation, “smart” refers to “I” in ICT, e.g., IBM’s Smarter Planet initiative 2008, over the top of “C” and “T”, “life” refers to PESTE and Maslow and thus Internet of Everything, and “shaping” is the McKinsey expression (Bryan et al. 1999) for the end game of the digital transformation which combines digital and physical. I use the expression “shaping a smart life” in this meaning later.
Rewind back to year 2001: “Unlike its European counterparts, NTT DoCoMo has created a working business model and an attractive customer-oriented value proposition for iMode … NTT DoCoMo has succeeded in creating the positive feedback loop. iMode supports a real Mobile Lifestyle, a relationship, not isolated value-added transactions whose revenues are separately and opportunistically maximized.

In the next phase, NTT DoCoMo strategy and challenge have three directions:

− Non-voice services are a growth area.
− Global leverage of network and portals using win/win partnerships.
− Connectivity of anything, that is, M2M (Machine To Machine) ubiquity. NTT saw the mobile penetration grow to 300%, including cars, boats, bikes and pets.

... In general, the Japanese approach to keitai or mobile phone culture seems to be driven by brave and even strange designs in contrast to – for instance – the strictly functionalistic Palm ...

... Last year at GSM World 2000 mobile Internet and portals were the big thing. Now the mood was that those were at least not an instant success, still maybe an idea whose time will come. For instance, in Finland the half a dozen mobile portals have only a few thousand users – all together. Under the pressure of venture capitalists some B2C companies are refocusing to B2B or technology providers. Instead of a Killer App the industry now tries to identify and deliver building blocks for 3G. This search is guided by the question what is specific to mobile? One obvious answer and thus the most visible of these building blocks at this conference is Location Based Services or Systems (LBS) which were offered by 30 to 40 different companies. If I had to name one thing at 3GSMA 2001 that is Location-Based Services. Hopefully LBS do not have the same fate as the portal hype.”

FOMA (Freedom of Multi-Media Access) service was to be launched in May 2001. FOMA was expected to have a 97% coverage in Japan in three years. The service had three conceptual terminals – voice, picture, and data – with a simple core value proposition: mobile multi-media.

Docomo’s mobile multi-media had been a huge success. The multitude of Japanese hardware designs was for segmentation, resembling Sony Walkmans. As my MWC 2001 report noted this looked strange, lacking a dominant design just as the early airplanes did. The hardware differentiation became the route followed by Nokia. In 1996, Nokia had launched the Communicator as the first commercially successful smartphone (although not named as such), after failed Apple Newton and IBM Simon, a nice and useful QWERTY keyboard product which I used for years. The name of the phone, Communicator, tells it was not intended to be an Internet device, not for “I” in ICT, it was a telco product for Connecting People, for “C” in ICT, although Internet made its breakthrough at the same time.

Nokia 7650 was launched in November 2001, followed by 3650 in 2003, later with an optional simulated rotary dialer. The devices were positioned as camera phones for multi-media messaging (MMS) and Club Nokia services, the first phones in the long series of such devices (to be renamed multi-media computers in 2006), but in the beginning they had no installed Internet browser. There was no reference to the Internet.50 I asked people I thought they should know: Why don’t you have the Internet? The answer: You see, this is about the

mobile, not about the Internet. Mobility and mobile premium, not the Internet, was meant to be the value proposition and driver. Instead of the Internet, which was what customers needed, were accustomed to use, with superior services and new financial models, the mobile industry pushed their own billable and closed Galapagos services\(^51\), so-called walled gardens, which were inferior, never really got ready, never got traction.

“Nokia divides 3G applications into four categories: multi-media messaging, location-based services, m-commerce (mostly payments), entertainment ... Vanjoki said the first one is the most important.”

One keynote speaker was from then-leading consumer electronics company Sony which soon lost its leading position to platform-based Apple and manufacturing champion Samsung. Sony’s strategy was based on core competence-based complex portfolio management (my summary of Sony’s presentation):\(^52\) “Sony compared digital technology to an egg. An egg can be eaten in many meals to provide both energy and enjoyment. Sony’s strategy is built on four platforms, three for home (Digi-TV, PC, PlayStation) and one mobile. In addition, Sony believes on three network enablers that are infrared, Bluetooth, and Memorystick. The last one is seen as a network platform any product can use ... Sony also provides add-on modules such as webcam, GPS, and fingerprint recognition, all Memorystick compliant. Sony believes that broadcast remains as the best channel to distribute music, movies and games and other manufactured commodity content. In mobile context, or ‘personal cast’, unique self-produced content becomes more important than canned content ... The potential problem in Sony’s case is the management of the broad competence portfolio. Can Sony leverage its competencies to succeed against specialized companies?”

### 4.2.4 Hypes of location and machine communication

Location-Based Services (LBS) and Machine To Machine communication (M2M) were the hypes in 2001. Ten months earlier (May 1, 2000), president Clinton had opened the Global Positioning Service (GPS) for undisturbed civilian use. In the 2010s, LBS consumerized and got widely used as components in services, business and financial models. The B2B solution has been tracking and control, consumer solutions are in traffic and travel (e.g., ride-hailing services), weather, marketing and rich real-time contextual information, including augmented reality, making “the reality easier to use”, “more than naked eye” (Qualcomm’s slogan for hybrid retail), and in games. The challenge for consumer engagement is the ease of use and relevance vis-à-vis information overload and interruptions.

Key concepts in Machine To Machine (M2M) connectivity were X-Internet (Forrester Research) and Supranet (Gartner Group).\(^53\) In hindsight, X-Internet was a good term for the

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51. The so-called Galapagos effect has been typical to many industries and markets especially in Japan, as described by Gerhard Fasol http://www.eurotechnology.com/2013/10/07/galapagos.

52. Founder Akio Morita died in 1999 and had stepped down as chairman in 1994. Year 2002 was the crossroad when the market valuation of Sony fell below that of Samsung. The case was later analyzed by Chang (2008).

53. Forrester defined X-Internet as executable and extended Internet linking real to virtual, communicating with owners, operators or manufacturers from tires to air conditioners. They wrote that X-Internet is emerging through devices and applications that sense, analyze, and control the real world. With cheap chips and the Internet, nearly every device that runs on electricity will have an Internet connection, through wired or wireless networks. The number of Internet devices will boom from 100 million in 2001 to 14 billion in 2010. “The extended Internet will reshape technology’s role in business ... most firms struggle to understand and act upon what is happening in their business now -- they’re lucky if they know what happened last week or last month. Extended Internet devices will provide real-time information about what is going on and provide knobs and levers for companies to control their
purpose – “X” as an unknown and everything. The concept Internet of Things (IoT) had been introduced by Ashton (1999) but not yet used at the congress. The computer was the brain, now it was getting senses and muscles. However, M2M and IoT became commercial disappointments and market research was far too early in its breakthrough estimates (Kellmereit & Obodovski 2013).

The diffusion was slow because of the need to build complex solutions for data- and knowledge-based services from sensors, actuators, devices, access, data and intelligence. M2M is an enabler rather than a separate business. Consumer applications during the 2010s were restricted to remote controllers and trackers (boxes with pipe, such as surveillance/security, energy and health devices).

4.2.5 Internet as the unknown

Before 2006, the Internet was not discussed at MWCs. It was a blind spot, below the radar. The future was seen in value-added services and in emerging markets. The success of Docomo with iMode had a huge impact. This service was used by camera phones with plastic differentiation, the boxes being sourced centrally by Docomo. The European mobile industry followed this Japanese keitai culture with multi-media (voice, picture, data) as their value proposition, hardware differentiation without a dominant design, camera-centricism, and with road toll financial models. The centralized control structure and “meter and bill” financial model attracted Communication Service Providers (CSP) despite that this model had already failed in the wired Internet. The information highway did not have road tolls.

A shift from isolated point apps towards service delivery platforms (SDP) was expected. Nobody paid any attention to the fact that some forms of the visioned services already existed in the global Internet where they had been phenomenal successes with hundreds of millions of users. The mobile industry was trying to reinvent the wheel by their local walled garden services.

As a context, discussed in Chapter 5.2, the broadband tornado was in full speed and the Finnish mobile lead market had saturated with a shock-like hypercompetition with the delayed 3G. Mobile industry did not pay attention to lead market stall and adjacent market success because their own industry was growing fast in emerging markets and finances were strong. Instead of local lead markets, MWCs were looking at global emerging markets. They did not disaggregate the global data to detect the real driver of the future growth which was hidden in small spots. Why to bother with the adjacent Internet, small and poor startups, nobodies.

At TeleManagement World 2005, the sole focus was on internal processes and enterprise architectures. In addition, Europeans focused on restrucutrings and related speculations on mergers and acquisitions in the geographically fragmented industry.

Mäenpää & Luukkanen (1994) had analyzed the coming convergence of television, phones and computers. The high-definition (HD) television developers in Finland and Europe in

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"Gartner defined Supranet as the emerging, ubiquitous network infrastructure that links the "e-world" (the world of electronic devices such as computers, phones, televisions and cameras) and the "p-world" (the physical world of paper, houses, people, vehicles, and so forth) within natural human interactions: "Global-class computing describes the movement of computing processes outside the enterprise … as computing and network access become truly pervasive, companies must be prepared to select projects based on their support for Supranet concepts." 

54 The authors described this cluster as consisting of manufacturing and sales of equipment, building and operating the networks, operating the networks, and value added services delivered through the networks.
the late 1980s and early 1990s saw Japan as their benchmark, lead market and competitor (RTT 2008, Saressalo & Tulin 2008). RCA (Radio Corporation of America) had dominated the world consumer electronics business from the 1920s to the 1950s but lost the color television business to the Japanese because of Sony Trinitron, a better product. In 1966, RCA redefined its business as communication and entertainment (Chandler 2001:42). The diversification from a single product company to a conglomerate destroyed the company “... and with it nearly all the U.S. consumer electronics industry” (Chandler 2001:38). The U.S. dependency on a single dominant company resembled the later relation between Finland and Nokia. It took 40 years for the U.S. to regain their global dominance in consumer electronics, now by software, enabled by the Internet, led by Apple, Google and others.

Around the year 2000 it looked like the Japanese are extrapolating their consumer electronics dominance to mobile business. From 1998, J-Phone allowed to customize their phones through the network and a year later Docomo launched the iMode platform and ecosystem with an attractive earning logic and a low barrier for developers and service providers. J-Phone was acquired by Vodafone in 2001 but iMode became the market leader and Vodafone sold its Japanese business to Softbank in 2006. Docomo’s iMode as a two-sided platform led to phenomenal growth but Docomo focused on Japanese markets. Modest and failed attempts were made to transplant iMode to The Netherlands, Germany and Spain. Obstacles for bringing the concept global were proprietary (non-GSM) networks, path-dependency due to a different socio-institutional environment (iMode was a substitute to the PC Internet) and the dominant position of the operators. Docomo specified the phones and organized bidding competitions for each box category. Isaacson’s Steve Jobs biography (2011) mentions several times Steve’s visits and contacts to Japan but does not point to iMode. Pekka Rauhala who lived in Japan (working for Sonera) at that time says that Apple looked at iMode and developed a better and global version of it by pushing local operators aside from the driver’s seat.55

The camera phone was a box and pipe approach to the convergence. According to market research, unable to discover abstract “things” and frameworks, the camera was the single most relevant component in the multi-media phone when compared to other box features. This camouflaged the real challenge of using smartphones for Internet access and services. Phones needed better software, natural user interfaces and, e.g., photo sharing services.

What was the ultimate rationale for the stickiness of the multi-media vision? These phones were seen as the final realization of the decades-old sci-fi dream of picture phones, the migration from voice to video, as earlier from analog radio to analog and early digital television, without yet changing the industry structure. This was not the only box and pipe approach — others were videotex, teletex as super telex, color telefax, and multi-media messaging (MMS).

What happened can be interpreted by zooming out from the congress halls to a bigger picture. Europeans should have watched the U.S. Internet but they were looking at the wrong direction. As a context, in the Lisbon strategy (2000) European politicians had declared that

(1994:16-17). They envisioned the convergence of media, computers, and telecommunications (1994:98-99). Nokia had tried televisions and computers but it was the phone that was the way to global success. This explains the belief that the telecommunications, not the computer business, is to dominate the new information space, in contrast with coeval visions presented by Bill Gates in his Fortune interviews.

55 Personal communication.
Europe will be the most competitive global economy by 2010. The success of GSM was touted as the symbol for European unity.

4.3 The years 2006 to 2007 – from a confusion to the confession

4.3.1 The Internet as the known unknown with confusion

I sensed big changes coming from right behind the corner and wrote a critical report about the achievements and state of mobile services. The cover of this MWC 2006 (officially still called 3GSM 2006) report summarized its content by a picture of the statue of Columbus in the Barcelona harbor: the mobile industry was going to and looking at Asia and the emerging markets, the East, instead of the U.S. and the Internet. The new land of opportunities was to be found in the West.

This 2006 MWC report described the strategies of 27 firms as they were presented in the congress and realized that the industry tried to follow – at least tacitly – the Hax-Wilde (2001) Delta strategy model where the three strategic positions are product, customer solution, and system lock-in, which made the difference to the lock-on Internet growth. The eight discourse themes were: (1) fixed-mobile convergence in developed markets versus mobile-only emerging markets, and the global oscillation between West and East; (2) joint industry initiatives to collaborate and compete with the Internet, e.g., in messaging and so-called rich media; (3) enterprise solutions, horizontal and vertical; (4) collaboration with media which also wanted to bill its content; (5) specific emerging market strategies; (6) service convergence by multi-media, service delivery platforms (instead of point apps) and marketplaces; (7) business implications of the mobile broadband; (8) lead markets, especially Japan. In addition, mobile was seen to migrate toward “brown” (entertainment) and “white” (utility) lines – first to the living room and later to the kitchen and the full smart house.

Same time elsewhere things had changed in a radical way. This was creeping into mobile consciousness: “Based on the Tuesday (Feb. 16, 2006) morning … recognition of the Internet seems to have transformed from a ‘blind spot’ to a ‘taboo’. Blind spot is something that exists but one does not see or does not want to see as the result of arrogance. Taboo is something one clearly sees but doesn’t talk about – either due to complacency or fear. It is the ‘pretended unknown’ in scenario analysis … the ‘paradigm’ defines what is permitted to take into account, what one can refer to. If taboos are discussed, then instead of the real name of the taboo some other self-invented and politically correct expression is used – such as ‘imitator’ (Coca-Cola about Pepsi) or ‘mobile multi-media’ (the current mobile industry expression for the broadband Internet). The Ericsson person in his speech about the future of handsets said that the industry no more uses three-letter words (such as ‘MMS’) but instead talks about ‘mobile multi-media’.

The problem is that a creative rhetoric leads to red herrings, or false clues. They set irrelevant questions or at least blur the relevance of questions that should be set. 3GSM 2006 showed that the discussion on ‘business models’ and ‘ecosystems’ is the same as in the fixed line Internet ten years ago (i.e., 1996). The mobile industry should look carefully at the development of the Internet during the last decade: What have been the genuinely relevant questions, how these have been solved, and what are the issues that are still unresolved but have not prevented – not even slowed down – the breakthrough of the broadband Internet?”
There were exceptions to the Internet denialism: "T-Mobile CEO Obermann described the T-Mobile strategy as full Internet access, music, micropayments, and enterprise office extension to pocket ... emphasized full broadband Internet, downplayed the relevance of past mobile ‘value-added services’ as attempts to create value only for operators.”

Nokia’s new CEO Kallasvuo had been leading the company’s U.S. business where Nokia had beaten the local competitor Motorola. Kallasvuo knew and said in a Finnish interview (Suomen Kuvailehti, 10/2006) that new trends emerge in the U.S. which will show the way. These were prophetic words because of the prevailing European self-understanding as the mobile lead market, challenged by Japan with iMode only. In 2006, many Europeans considered Americans as laggards.

Before that interview, at MWC 2006, Kallasvuo said that complexity is the biggest challenge in the mobile industry: “Kallasvuo answered – when asked – that the biggest challenge that keeps awake at nights today is the complexity. This was a disappointing answer which was referred by at least two later keynote speakers. But what does this mean? ... Complex systems like the Internet cannot be invented or planned. Complex systems emerge and they are discovered as they fold out ... when the industry is ‘on the edge’, in a sensitive stage looking for a new direction, somebody is needed to ‘lock-in’ or ‘freeze’ a new direction.”

One of the later keynote speakers reminded that in the past it was Nokia which had showed the direction to others. This was a tacit and polite critique. Nokia had been the trendsetter and the intellectual leader. Now it was no more able to lead. It is known that confusion (in this case, among several key industry leaders) is an omen of a coming discontinuity and jump to a new curve (Foster 1986), as happened next year.

Complexity theory is short on practical management tools (Stacey 2001, 2012). Complexity jargon such as emergence can even be used as a plea for wrenching, drifting and the lack of determination. However, this episode highlights two managerial observations about complexity: first, the need for a freezing attractor, and secondly, confusion precedes discontinuity.

This year 2006 was the fourth and final year of the adjacent broadband tornado in the Finnish lead market (Chapter 5.2). Having seen how global Internet ecosystems, services and business models had broken through in a few years’ time, I wrote in the MWC 2006 report that Internet firms have led the service development, not the mobile industry which did not have chances: “Looking back last five years, first generation of mobile data services have been on a sidetrack and have had very little relevance and customer value. Everything important that has happened between 2000 and 2005 has been on the fixed network side – i.e., broadband and its Wi-Fi tail. Mobile data services – except maybe to some extent in Japan – have flopped. As Business Week wrote during the Barcelona show, telcos have been very disappointed with 3G even if the industry spokesmen and vendors pretended that everything has gone and is going all right. A journalist from the audience stood up and told that he has heard every year the same stories about ‘new fabulous services’ and ‘increased ARPU’ that the vendors have promised. He had visited this same conference for 12 years. Looking at the hard facts the growth only comes from new customers, from ‘U’ not from ‘AR’. The ARPU is flat at best.”

The fast growth of users had carpeted the strategic problem which the mobile industry was never able to solve. This required strategic innovators from outside the industry as Manoj Kohli, CEO of Indian Bharti Airtel, noted at MWC 2013. He commended Silicon Valley
innovators about bringing 3G and 4G alive and said that Communication Service Providers (CSP) would never have made those innovations.

Especially the U-growth (“U” from ARPU) lulled Nokia. The same threat of losing touch of lead markets was faced by CSPs whose growth had been based on expansion in emerging markets by copying the past Western success formula. To avoid this trap, they need lead market innovations, not considering lead markets as portfolio cows.

In addition, I visited CTIA 2006 in Las Vegas. It highlighted the coming convergence of broadband and mobile. Big traditional media companies were strongly present instead of Internet companies: "New strategic era: to wrap up, telecom has entered a new period after the pure service oriented 'break' 2000-2005. Expect the next five years’ strategic era is vibrant. There is no clear path ahead but a growing tree of branches and choices.

The goals of media and Internet firms are different. It seems that telcos think media as ‘friendly Indians’ (a common road-side billboard in the desert) or even as ‘customers’ (which they are not, they are partners in providing win-win-win services for end-users). Internet firms are seen more as ‘competitors’ and arrogant ‘bad guys’ who not just want to extend the Internet business model to mobile but also because these ‘enemies’ are involved in all kinds of wanna-be disruptive Voice over IP or Wi-Fi schemes. Instead, media stays nicely on its estate and lets telcos take care of the technology and distribution of their content. Of course, the only customer here is the end-user who is the ultimate decisionmaker and successfactor."

4.3.2 The mobile Internet emerges

The 2007 MWC report recognized six discourse themes and even tried some qualitative modeling:

- "Emerging markets drive the industry today and in the future. The explosion in the number of subscribers had again exceeded all expectations. The target now was 5 B mobile voice subscribers in 2015, or 70% of world population. In the same time frame mobile broadband was expected to make a similar breakthrough. Expect huge growth centered in Asia but also in other emerging markets (Africa, Latin America). This has major social and economic consequences, it will redefine the world economy, meaning the re-rise of China and India …"

- Mobile industry evolution life cycle has five stages: network, value-added services, virtual operators, Internet services, and business processes. The disconnect occurs between stages three and four. The big issues today in developed markets are stages four (‘long tail’ Internet services in general and Web 2.0 and social production in particular) and five (enterprise processes that recognize the multiple roles of people as consumers, workers and customers, e.g., Nokia had named this ‘holistic mobility’) …

- This means that mobile and broadband are going to converge. Specific mobile services and television in various formats are marginal phenomena from the Information Society and Digital Economy perspective. They are going to be dwarfed by the mobile broadband ... Wi-Fi is not considered as a strategic issue (competitor) anymore, it is no more in the radar. Enabled by mobile broadband, and without legacy, emerging markets leapfrog into new digital business models and processes and lifestyles that boost sustainable development ..."
The new playing field or ecosystem consists of operators (now renamed as Communication Service Providers), media, Internet players, prosumers (self-generated content) and all other firms including system integrators.

Consumer services evolve in the reversed Maslowian sequence from self-fulfillment to daily processes in living and work. Play and work do not conflict but co-exist in B2B2C2C.".

The mobile industry value chain analysis in the congress was now more sophisticated than before with four identified positions based on the depth of value creation: own offer (vertical value chain), partner, enabler and access provider (horizontal value network).

But the very key event was that in January 2007, Steve Jobs had launched the Internet phone, abbreviated as iPhone. His value proposal was simple: put the music player, the Internet, and the phone together, reinvent the phone. This was software-based with a minimalistic box design. The differentiation and segmentation was based on the software instead of the box which meant that this phone was competence destroying for some classic analog-era managerial skills such as segmentation, portfolio, process and retail shelfspace management. The phone as a platform was market broadening as well.

In February 2007, five weeks later at MWC, Arun Sarin, CEO of Vodafone, the biggest CSP at that time, had got "it" and understood where the puck was going to. The abbreviation of Sarin’s speech (my notes, not a verbatim quote): "Internet firms are going to take our business – we are too slow. The presentation was aggressive, driven and fueled by fear of Internet, and simultaneously signaling a new strategy and new determinism. Sarin said that it is essential to grow to bigger pools of revenues, entertainment and advertisement are musts. Compete with fixed line, press hard. Embrace new forms of communications from web. Capture new revenues streams from higher bandwidth, software, devices, ads, payments, mobile tv. We need to move fast before somebody else occupies these spaces. Example: advertisement. Mobile is an ideal ad media. Advertisers should pay premium. Does not happen automatically. Opportunity exists but is easily taken away. Enable new industries in the mobile industry. Cross-industry standards are needed. E.g., the most appropriate size of banners, length of video ads etc. Current initiatives are too fragmented. Be faster in execution. It takes too long time for us to get things done. Otherwise others eat the lunch. Web is moving into mobile space and fast. Think about YouTube. 20 M customers took 18 months. In mobile industry, it took a decade. Stop talking and deliver."

A confusion in 2006 had changed to the confession in 2007 but not yet by everybody. Sarin was an exception and an omen. As the opposite to this and Samsung’s insight, many misinterpreted iPhone. A common understatement was that it was lacking properties, i.e., technical features. iPhone was downplayed by some industry analysts which did not matter much, but also by some key leaders such as Microsoft’s Ballmer ("no chances"), Nokia’s Kallasvuo who welcomed it as stimulating the market, and Vanjoki who denounced it as a niche product and just one phone while Nokia had broad portfolio with a phone for all price points. But what else they could have said? And it was just one phone: a platform with an

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56 Samsung’s phones had been built on Symbian platform and the company was known to follow Nokia. They understood the Internet phone revolution fast and jumped onto the Android bandwagon.

57 In addition, these speeches leaned on the prevailing dominant logic of low-end disruptions. iPhone as an upmarket product was seemingly against Christensen’s (1997) theory. He (2007) wrote that “... the prediction of the theory would be that Apple won’t succeed with the iPhone. They’ve launched an innovation that the existing players in the industry are heavily motivated to beat: It’s not (truly) disruptive. History speaks pretty loud on that, that the probability of success is going to be limited.” Later (2014) he explained that disruptive innovation is an evolving theory, in 2007 he still did not get that iPhone was a low-end disruption to the laptop, not Nokia.
attractive financial model for the app ecosystem. The intentionally low barrier of entry devalued classic managerial skills and accelerated product development by more spins, higher clockspeeds, a global basin and strong coherence.

Startups and adjacents outflanked the more than century-old regionalized tele-communication industry which had believed in stability, was used to barriers of entry, and became surprised by the fast breakthrough of the mobile Internet. There was no time to react.

4.4 Post-2007 – connecting the world to the Internet and beyond

The mobile industry had adopted the new narrative of connecting the world to the Internet but the specific themes were in search. The hypernym Connecting Life contained sessions on retail and advertizement; finance, money and payments; energy, traffic and housing; education; health and other big social issues, and exhibitions on smart housing and cities. This was about Internet of Everything even if the industry still preferred the connectivity term.

When it comes to MWC speaker positions, the powershift was seen in that the U.S. now had the lead role in presenting innovations to the detriment of Europeans. This observation was so obvious it was spontaneously made on site by several panel moderators and speakers.

4.4.1 The mobile Internet in the tornado phase

In 2011, the jump to the next S-curve had been completed and the mobile Internet had reached its tornado phase. Leadership had changed, Internet companies had conquered the mobile world. Smartphones and tablets were outselling PCs. When I looked at the thousands of people around me in the main congress hall almost everybody seemed to use an iPad and its touchscreen for ease and fast writing.58 The 86-page MWC 2011 report was longer than usual, trying to make sense of the new reality. The key discourse themes were:

− "The digitalization long wave and the shorter Juglar cycles (S-curves). The mobility had evolved through three phases: First, Connecting People (Nokia to leadership), then connecting the world to the Internet (Apple and Google to leadership), next connecting life (the mobile industry vision in search of growth beyond the Internet). In practice, connecting life looked like the reinvention of M2M hyped at 3GSM 2001.
− Jumping the curve. Numbers of smartphone and tablet sales proved that digitalization has jumped to the next and fifth S-curve called the mobile Internet which consists of post-PC devices, ubiquitous broadband access and cloud services ...
− Mobile Internet architectures: Browser or web, app, embedded, and broadband cache. HTML5 is narrowing the gap between web and apps. Embedded means the trend and strive to connect things to cloud. Cache means the batch night-time or early morning reception of media subscriptions ... or downloading media content ... due to weak network conditions.
− Triadian competition between America, Europe and Asia. In 2001, Europe was the undisputed lead market. In 2011, innovation had moved to America, production and scale to China.
− Google, Microsoft (with Nokia) and Apple are the three horses. But in addition to this Western theory of three horses (from Bruce Henderson and Boston Consulting Group, 1979:92-96, describing the balance of an oligopoly which benefits all stakeholders),

58 This is worth mentioning because easy writing on a touchscreen had been conceived as difficult if not downright impossible.
there is a Chinese story of a three-horse race which says that position the stronger (new) horse against the weaker (old) horse and you will win 2-1. This is taught at Chinese business schools (Chen 1994, 1995) and this is what one sees on the market when cheap Android phones attack from the low-end using the existing ecosystem of apps.

- Many MWC 2011 speakers blamed Apple for being too closed. They did not understand that Apple’s success was based on being closed and open at the same time, having a dual strategy. Apple was the first to offer a superior full Internet usability with iOS. At the same time the platform is controlled.

- Embedded consumer electronics and examples of connecting life. This is the mobile industry vision beyond the Internet. But this is a fragmented and vertical vision and the industry lacks vertical competences when compared to IT firms.

- Mobile ads and monetization. These presentations still lacked a clear vision. The secret code of mobile Internet monetization was uncracked. Compared to the huge time spent with mobile devices there is still little ad money involved … Maybe there won’t be any Google-like single monetization formula. The value will then consist of multiple streams and its migration to customers may dwarf the revenue.”

The 2011 MWC report recognized the “tight and loose” strategy of Apple – tightly controlled stack and loose map with a low barrier of entry. It also documented what 14 business executives said about their corporate strategies.

Most Communication Service Providers (CSP) still made 70 - 80 % of their revenue from voice. The European Union was planning to enforce limits to this billing because roaming costs decelerate innovation. A tricky situation – new businesses do not get enough attention compared to the old, even if the old is “dead horse riding” (which it was not yet, in short term at least, just saturated). One solution was to establish new business divisions (examples: Telenor, Telefonica) or an innovation foundry (example: AT&T). Radical innovation then distances from daily customers, satisfaction and continuous improvement like the gigs in the strategic trident. But CSPs have a history of “kissing frogs” (Campbell 2004) because – in developed markets – few of their additive services have taken off in a big way, as complained repeatedly by themselves at MWCs.

4.4.2 On Triadian competition and geographical value migration

In the 1980s, Europeans had lost the PC and related emerging software business to the Americans. A decade later, Europeans lost the competition over the Internet economy. Explained by Kogut (2003:16-17), the reasons were the “meter and bill” financial model together with the planning paradigm. An exception had been the mobile industry where GSM and its early consumerization kept Europe at the top. But soon the transformation reached the European mobile industry as well. In 2011, America had bypassed Europe for the third time. French venture capitalist Jean Schmitt summarized this at MWC 2011:

- “Twenty years ago (1991) Europe gained world leadership in mobile due to GSM and related innovations.
- Ten years ago (2001) leadership was established and complacency started to hit.
- Five years ago (2006) was the place of no return, the last moment of truth, which passed on unnoticed and the momentum was lost. Why to bother about distant future, cash flow is great and the leadership is firm.
- Today (2011) Europe suffers from institutional stagnation and denial. European network vendors and operators have too weak balance sheets and manufacturers have lost their vision.
- Tomorrow Europe supplies tech superpowers with R&D. The vicious circle is that there is nowhere to go.”
Schmitt’s point was that the Europeans had missed the mobile Internet. The curse of success had been discussed by Kotter (1996) who wrote that the transformation must start at “the times of record profits and happy talk”. It did not. Schmitt said that there is a denial and a belief in “our innovativeness”. He continued that because the mobile Internet game is lost it is better to focus on the next cycle which he thought as mobile money.

Europeans may have lost much of the mobile Internet game yet there are success stories and the U.S. dominance is not global. Yandex is the search market leader in Russia. The Chinese Internet user base is by far the largest in the world and Chinese Internet services are local market leaders in all categories. For different reasons – the government policy of Internet sovereignty, extreme competition and the unwillingness to adapt to local culture and context – Western Internet firms have not succeeded in China. But home market protection could be an obstacle for globalization in content, services and other soft power beyond manufacturing, as noted at MWC 2015 in Shanghai. Otherwise, political and regulation issues were not discussed at MWCs.

4.4.3 Digital transformation as expanding strategy and structure with new dynamics

The lack of speed and acceleration was complained year after year by industry dignitaries. When mobile superseded wired in the 1990s, first by the European voice-centric GSM cluster and a few years later by the Japanese iMode platform with multi-media phones, it created a new clockspeed, a new rhythm. When the Internet superseded mobile communications a decade later, it again meant a new clockspeed, with new spins, wider basin, and strong coherence. The Internet clockspeed meant that “the old fast guys became the new slow guys” (Verwaayen 2012).

John Chambers, then-CEO of Cisco, talked about the need for speed at MWC 2012 and 2013. He said that (my notes, not a verbatim citation) “… markets will consolidate, the ability to move faster is the very key, and this is an architectural play about openness … (Chambers) spends much of his time with customers, and brings customers´ ideas back. The threat of moving not fast enough keeps awake, the problem is not the speed of change. New big services at home, in energy, in health, and in transportation did not even exist a few years ago. The future is much more dynamic than the past. And one must lead it from the frontline, outside-in ...”. In other words, he described the expanding strategy and structure where the company clockspeed should be faster than the market clockspeed.

When it comes to the business models, pre-2007 speakers did not refer to the Internet, but later some key mobile industry executives urged Communication Service Providers (CSP) to learn innovation from Internet firms. It was also admitted that in the 2010s it is more important to grow the pie (create value) than to slice it (extract value) as the industry had

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59 Schmitt’s (2011) description of European innovation brings to mind the Japanese 5G computer program 1982-1992. The concept of an innovation system came from Japan where it was successful during the analog era, explained by the role of the state and its collaboration with corporations. This institutionalized system was praised and transplanted. But as it happens with the halo effect, the 5G program failed. The 1990s belonged to the U.S. and the Internet. It took a decade before iMode brought the Japanese ICT back to lead but this centrally controlled system was no more able to shake the already decentralized Internet.


61 Such as Arun Sarin (CEO of Vodafone at MWC 2007), Li Yue (CEO of China Mobile at MWC 2012), Ralph de la Vega (President and CEO, AT&T Mobility, at MWC 2012) and Manoj Kohli (CEO of Bharti Airtel at MWC 2013). These firms from Europe, China, India and the U.S. are among the largest in the industry.
thought earlier.\textsuperscript{62} Still in 2012, new business models were denied in an executive panel discussion\textsuperscript{63} but in 2015 a new strategy was called for by several key industry leaders.

The discourse on datafication in the 2010s was internally focused on operations, maintenance and customer relationship management (CRM as marketing, sales and service). Otherwise the data-based approach was either absent or denied. For instance, in a full-day mobile health session in 2011, a leading actor used time and slides to argue that the communication approach is better than the information approach of the IT industry. TMForum founder and Chairman Willetts in his book (2012) discussed the perils of information-based business models which had been predicted by Larson (1994) and Tapscott & Ticoll (2004) as, e.g., “nakedness”. A TMForum Newsletter (2014) dedicated to the perceived threats and problems of datafication and presented a privacy dashboard as the solution. “I” in ICT was conceived as a threat and an otherness, not as an opportunity like in the Internet where data had substituted money.

As a keynote speaker at MWC 2012, Ralph de la Vega (President and CEO, AT&T Mobility) spoke about mobile excitement. He started by saying that “… skeptics say saturation, and they think we are sidetracked. Not so …”. This opening of his speech targeted previous pessimistic European speakers who spoke about saturation and complained the decline of their businesses. The excitement is created and kept on by innovation. De la Vega described the five-layer virtuous cycle of innovation: spectrum, advanced networks, innovative devices, applications and content, and consumers who increase their consumption. De la Vega said it all starts with spectrum, having a “C”-centric perspective to ICT. In addition, he emphasized ecosystems; the stack is not for own use only – i.e., an enterprise architecture (EA) for internally developed and offered services only – but an external platform for attracting and supporting developers and service providers.

Digitalization has always reached out for the next cycle, the next big thing, the miracle, the new engine of radical growth. Concrete and understandable “things” attract investors but often big “things” are understood only after seeing them. Upcoming point innovations such as wearable computing and “app-cessories” (smart watches and glasses) were concrete artifacts shown and discussed at MWC 2013. The big issue however was the more abstract digital transformation. Mobility was no more seen as a separate “our thing” but as a holistic and systemic transformation of living, everything. Connected life or economy was the socio-institutional umbrella for the transformation in retail and advertizement; finance, money and payments; energy, traffic and housing; education; and health. Especially the on-going retail transformation was discussed by world leading retailers and startups in presentations and panels. E-commerce was born in the mid-1990s but it did not mean “same but better” as digitization by literally electrifying existing commerce with a new channel; instead, the Internet enabled new retail strategies and structures. MWC had renamed this phenomenon Digital Commerce (focus on mobile money and fintech/techfin) and Smart Retail (focus on Online To Offline, O2O).

\textsuperscript{62} Vittorio Colao, CEO, Vodafone, at MWC 2011 panel discussion: “Growing the pie is more important than slicing as we thought three or four years ago.” He referred to Porter & Kramer article of value sharing in Harvard Business Review (2011).

\textsuperscript{63} “We have to defend our business model” was the answer of the Chairman of GSMA to China Mobile CEO Li Yue who urged the industry to learn innovation from the Internet.
4.4.4 The year 2015 and Mobile Unlimited – mobile money and Internet of Things

The theme of MWC 2015 was Mobile Unlimited interpreted in two ways.

Firstly, there was plenty of room in emerging markets for basic mobile services and Internet access. Only a half of the world population was connected to the Internet. In addition, the emerging market mobile industry had been successful in mobile money, starting from payments, expanding to banking with loans, then to insurance, as a part of the fintech revolution. The social role of digital and financial inclusion and leveling – fulfilling United Nations millennium and sustainability goals – was emphasized in the opening speeches of GSMA President Anne Bouverot and Chairman Fredrik Baksaas. In emerging markets, only rich people have had credit cards. Mobile banking empowered the underserved majority, transforming them from grey economy and cash on delivery payments toward organized society, creating the basis for economic growth, trust and social security. Fintech had been in the focus of the mobile industry since the 1990s, especially payments and the mobile wallet, now facing competition from everywhere, especially from startups. The MWC optimism differed in a fundamental way from the coeval critical views of Stiglitz (2014) toward fintech innovations.

China Mobile and Chinese Internet conglomerates Alipay (Alibaba) and WeChat (Tencent) presented credit-focused mobile banking services with biometric recognition and real-time credit risk management. According to GSMA, Internet banking and commerce in Asia was an extension from high-interest and existing core services such as Alibaba commerce and Tencent social media. For instance, teenagers check the social media on the average every five minutes. This large user base is connected to commerce processes – such as payments, marketing including couponing and loyalty, and taxi or ride sharing such as Didi Chuxing – as satellites to the core social media service.

In the digital complex shown in Figure 4-2, social media, retail, services and their marketing are seamlessly linked to financing and traffic, e.g., trips to stores or events, targeted at the underserved masses, recombining long-existing analog era industries to create a strategic attractor.

![Figure 4-2 Recombination: fintech, social media and consumption creating a strategic attractor. Adapted from Alipay at MWC 2015.](image)
Secondly, Mobile Unlimited pointed to Internet of Things. South-East Asia comprises of some of world’s richest and most advanced countries such as Japan, South-Korea, Singapore, Taiwan and parts of mainland China. It was well-known to the mobile industry that it had not shined in lead market innovations compared to Internet startups and adjacents. That is why the presentations on Internet of Things were the most sophisticated and best prepared I had seen at MWCs. The subsequent presentations of the strategies of KT (formerly, Korea Telecom), Samsung and Ericsson in the Internet of Things session were competitive pitches from a mobile operator, a device manufacturer and a network element and service provider. Who had the most compelling and credible story for customers, analysts and investors? In the aftermath of this drama, the panel discussion was about who makes money here and how. The answer was left hanging in the air: it is the customer, the value is not in connectivity. This was confirmed in another keynote interview by Nokia’s CEO Rajeev Suri who said that “… we’re working on connectivity platforms for IoT, but ultimately the answer is not there. The spend will be all in the services and applications. So, you move from connectivity platforms to IoT enablement platforms and then you pick a couple of verticals. So, we’re picking verticals of maybe healthcare, maybe car, because we’ve a mapping business in-house, and eventually how do you work with the network players like us, and the operators, and these vertical industries, is where the challenge is”.

In the presentations on strategy and leadership, China Mobile chairman Xi Guohua said he had understood the need for a mindset shift to a software company.64 Docomo CEO Kaori Kato announced that they open their platform and capabilities to create an ecosystem, instead of the traditional Do It Yourself (DIY). Third example was former Telstra CEO David Thoday whose keynote speech called for a new leadership for “changing the important things in life”: collaboration, innovation leadership and customer-centricism. The mobile industry faced the challenge of transforming from process-orientation to create new capabilities for serving new needs and markets.

Smart City, Smart Home and Smart Retail were instantiations of Internet of Everything. The Smart City session presented cases and methods, e.g., both about strategy and the city as a distributed collection of mobile apps. Smart Home was concretized by BSH (Bosch, Siemens, Gaggenau) and Huawei home appliance architectures. Samsung told they are going to connect 95 % of their appliances by 2017 and the rest by 2019.

For Smart Retail, McKinsey study (2015) had recognized automated checkout as the biggest opportunity in developed economies. Later, the automated store became a hotspot of development for Amazon and Chinese Internet giants. In addition to payments, the focus was on Online To Offline (O2O) with resource efficiency. A trend (described by Nielsen figures) was that Chinese consumers had been abandoning hypermarkets. An example used indoor positioning to attract people back to shops by bonuses from walking in the shops, from rising upstairs in multi-store buildings and from touching (scanning) the merchandize. Other examples were Augmented Reality (AR) and Virtual Reality (VR). Textile industry was the vanguard of industrial revolution first in England (1800s), then in Japan (early 1900s), later in China (late 1900s). In the West, clothing is largely considered as a scale and low cost business whereas in the East the value of premium clothing is still appreciated. AR and VR fitting rooms make it possible for the clothing and beauty/cosmetics industry to migrate toward service and customer intimacy and save precious retail space. Besides clothing,

furniture – a keynote given by Ikea – was another AR and VR case for consumers and real estate brokers.

MWC 2015 had gone a long way from the earlier MWC conception of digitization as connectivity and devices towards the more abstract digital transformation with “things” as complexes and recombinations. It was now addressing digitalization through issues with large shares of consumer wallet and thus high relevance, and expressed the intent to support corporate innovation for full Maslow and PESTE superstacks.

### 4.5 Summary

Three checklists – Digital Transformation Maturity Model (DTMM), classic vis-à-vis new strategies and structures, and business dynamics – are tested as indicators against the MWC observations.

#### 4.5.1 The missing Internet insight in the global industry

Using Table 3-2 (the DTMM checklist for the transformation cycle) based on Figure 2-2, the MWC observations are mapped to the transformation cycle in Table 4-3.

<table>
<thead>
<tr>
<th>Tool/indication for the transformation cycle</th>
<th>Observations on MWCs 2001-2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Generations of insighting</td>
<td>Up to 2007, European mobile industry looked at the Japanese multi-media as the lead market instead of the U.S. and the Internet. The aggregate growth in emerging markets blinded the industry. The powershift and value migration to the U.S. Internet was highlighted in 2011.</td>
</tr>
<tr>
<td>(2) Puzzle of knowns and unknowns</td>
<td>Internet as a known unknown up to 2007, i.e., known by name but unknown as a framework for ecosystems over generative platforms. Adjacencies, startups and their business models seen as otherness compared to “meter and bill” financial model. Lead markets and the disaggregation of the dynamics understated to the detriment of aggregated emerging market data.</td>
</tr>
<tr>
<td>(3) Superstacks with megatrends and collisions</td>
<td>Visions based on connectivity except, e.g., Docomo’s Shaping a Smart Life. In the 2010s, attempts to cover PESTE and Maslow superstacks with a networked B2B approach to support corporate innovation.</td>
</tr>
<tr>
<td>(4) Map of business dynamics</td>
<td>The lack of speed and innovation confessed by the industry. Late timing of the commercial breakthrough of the Internet.</td>
</tr>
<tr>
<td>(5) Kite strategy map</td>
<td>No observations yet, tool to be reused in Chapter 5.</td>
</tr>
<tr>
<td>(6) Stack</td>
<td>Observations on internal and industry structures, tool to be reused in Chapter 5.</td>
</tr>
<tr>
<td>(7) The alignment matrix with (mis)fits and (in)coherencies</td>
<td>The industry first tried to create new services on internal and industry structures, tool to be reused in Chapter 5.</td>
</tr>
<tr>
<td>(8) Globalization</td>
<td>The global Internet dwarfed the local service delivery platforms in the regionalized industry. The failure of globalization epitomized by the case Softbank (Masayoshi Son 2011) and later by in-market consolidations (2015).</td>
</tr>
<tr>
<td>(9) Talent Supply Chain Management</td>
<td>Mobile industry used corporate, industry and networked processes to create services for their legacy business model. This meant TSCM resourcing.</td>
</tr>
<tr>
<td>(10) Lean discovery</td>
<td>Information-based financial models (free for consumers) seen as otherness, as threats for the industry and consumers, instead of opportunities in the outer Internet space.</td>
</tr>
</tbody>
</table>

Table 4-3 Operationalization of the transformation cycle – version 1.

From the point of view of the thematic analysis process (Boyatzis 1998), the four indicators for a missing insight (numbers #1 to #4) have manifested matches in MWC observations. The observations show that the mobile industry had missed the Internet as was even explicitly told by several of its key leaders – “learn innovation from the Internet” (Li Yue China Mobile
“Silicon Valley brought 3G and 4G alive and we would never have made those innovations” (Manoj Kohli Bharti Airtel 2013). But the indicators (numbers #5 to #7) for strategy and structure – map, stack and alignment matrix – were left abstract and vague in the MWC discourse. These gaps are filled in Chapter 5 by zooming in to the Finnish manifold lead market and to then-lead company Nokia by using event logging for raw data. The three last-mentioned indicators (numbers #8 to #10) – failed globalization (examples: Softbank, in-market consolidations), reliance on classic TCSM (due to corporate and industry services) and lack of lean (due to “meter and bill” financial model) – were latent themes as “underlying aspects of the phenomenon under study” (Boyatzis 1998:63) but match with the “holon” of classic-biased strategy and structure to be addressed in Chapter 5.

### 4.5.2 Classic and new strategy and structure

Based on the checklist in Table 2-1 (now with separated economic and marketing indicators), indications for classic-biased strategy and structure from the MWC observations are listed in Table 4-4: managerial focus on finances and marketing with value extraction – “growing the pie is more important than slicing as we thought three or four years ago (Vittorio Colao Vodafone 2011)”; industry analysis by the value chain and cluster with known competitors and peers; emphasis on portfolio and process management and enterprise architecture; slowness; and lack of software, computer science and Internet expertise and interest. The industry self-identity was the value chain instead of ecosystems over generative platforms, they understated new business models which were free for consumers, focused on existing connectivity business, suffered from slowness and resisted value migration to customers. These indications further support the “holon” of classic-biased strategy and structure to be addressed in more detail in Chapter 5.

<table>
<thead>
<tr>
<th>Indication for classic-biased strategy and structure</th>
<th>Observations on MWCs 2001-2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Primacy of economic and financial managerialism</td>
<td>ARPU as value extraction initially by “meter and bill” monetization as Key Performance Indicator (KPI). No business model innovations. Key people with financial or general business backgrounds.</td>
</tr>
<tr>
<td>(2) Supremacy of marketing</td>
<td>Multi-play understood as bundles for one-stop billing and selling, not as platformization for Over The Top (OTT) services.</td>
</tr>
<tr>
<td>(3) Dominance of mobile industry value chain and cluster analyses with known competitors</td>
<td>Connectivity “C” in ICT as the vision. Focus on existing competition and peers. Blind spot towards adjacents and startups and their business models. Regional Mobile Virtual Network Operators (MVNO) and services.</td>
</tr>
<tr>
<td>(4) Portfolios and processes more important than actual products, enterprise architecture (EA)</td>
<td>Focus on enterprise architecture (EA). Emerging markets as portfolio stars and developed markets as cashcows instead of lead markets.</td>
</tr>
<tr>
<td>(5) Trust on simple dynamics, slowness</td>
<td>Lack of speed complained frequently by key industry leaders.</td>
</tr>
<tr>
<td>(6) Lack of world-class expertise in new core</td>
<td>Lack of interest towards computer science, software and the Internet. Datafication seen as an internal and operational issue or otherness.</td>
</tr>
</tbody>
</table>

Table 4-4 Classic-biased strategy and structure using the checklist.

### 4.5.3 Mobile industry dynamics and eras

Table 4-5 uses the map of business dynamics (Table 3-1) to classify observations from 2001 to 2015. The year 2006 was the year of confusion exemplified by Kallasvuo’s answer that the business is complex. The year of the Internet confession was 2007 epitomized by Sarin’s
radical opening keynote speech. Lindén (2015) traced this Internet awakening moment to 2008 based on the interviews and writings of former Nokia management. But the year of Internet’s commercial breakthrough had been 1995 and the pivotal year for its new framework – strategy and structure – had been 1996. The Internet awakening was ten to twelve years late in the mobile industry.

Slowness and lack of innovation were discussed and admitted also after the Internet confession – “it takes too long time for us to get things done” (Arun Sarin Vodafone 2007), “the old fast guys became the new slow guys” (Ben Verwaayen Alcatel 2012), “the ability to move faster is the very key” (John Chambers Cisco 2012). Elsewhere, Stephen Elop, CEO of Nokia, said in the end of 2010 that Nokia still didn’t have a response to iPhone launched almost four years earlier (Chapter 5.4).

Based on the MWC presentations in 2011, the industry self-understanding and identity had evolved in three phases: (1) communications and connecting people up to the breakthrough of smartphones, and after that, (2) connecting the world to the Internet by mobile, heading towards (3) connecting life and economy in the 2010s. The central role of connectivity comes from the very definition of the industry by mobile connectivity different to fixed networks. Based on the analysis above, I add the mobile Internet disruption to the industry eras and dynamics as visualized in Figure 4-3:

- The Internet as the known unknown 2001-2005. The Nokia slogan Connecting People was the de facto narrative for the whole industry with voice as core and value-added data as context for extra revenue. Europeans saw themselves as the voice lead market but positioned Japan with Docomo iMode as the mobile multi-media lead market driven by camera phones. Europeans boldly saw emerging markets as the source of growth that would extrapolate their success of the 1990s to the global dominance in the 2010s. The emerging market growth was spectacular and very much visible at MWCs. But this global

<table>
<thead>
<tr>
<th>Tool/indication for the business dynamics</th>
<th>Observations on MWCs 2001-2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Long wave</td>
<td>Because of the Internet, following Perez (2002), an assumed midway and turning point in the long wave with value migration towards customers, potentially shrinking businesses, and from “T” and “C” to “T” in ICT. This was only tacit if not at all conceived.</td>
</tr>
<tr>
<td>(2) Shock</td>
<td>No observations yet, tool to be reused in Chapter 5.</td>
</tr>
<tr>
<td>(3) S-curve pairs</td>
<td>The jump to the mobile Internet S-curve caused a disruption with adjacent and startup Internet players taking over much of the new business. Year 2006 was the year of confusion and the late timing was first recognized by Vodafone’s then-CEO Arun Sarin in his opening keynote speech 2007.</td>
</tr>
<tr>
<td>(4) Fluctuation</td>
<td>No observations yet, tool to be reused in Chapter 5.</td>
</tr>
<tr>
<td>(5) Fashion</td>
<td>In 2007 and 2010, iPhone and iPad became unanticipated consumer fashions. Adjacent Apple succeeded in what the mobile industry had tried since the mid-1990s.</td>
</tr>
<tr>
<td>(6) Quartals</td>
<td>No observations yet, tool to be reused in Chapter 5.</td>
</tr>
<tr>
<td>(7) Hype</td>
<td>Location-Based Services (LBS) and Machine To Machine (M2M) hyped at 3GSM 2001. This calmed due to the immaturity of 3G technology, to return in the 2010s with the mobile Internet, still missing the consumer financial models but substituted by B2B.</td>
</tr>
<tr>
<td>(8) Hockeystick</td>
<td>iPhone in 2007, iPad in 2010 and the resulting mobile Internet seemingly jumped over the hype curve and chasm to an immediate success. However, this is a questionable interpretation because of early predecessors in the 1990s.</td>
</tr>
<tr>
<td>(9) Noise</td>
<td>Noise, positioning and agency were omnipresent in the discourse.</td>
</tr>
</tbody>
</table>

Table 4-5 The map of business dynamics.
vision blinded the incumbent industry from seeing the real lead market which was the U.S.-based Internet driven by adjacents and startups. Emerging ecosystems over generative platforms was an unknown framework to the mobile industry. In addition, operational excellence with one company enterprise architecture was in the industry focus.

- The disruption, i.e., confusion to confession 2006-2007. This was the coming of the mobile Internet where the U.S. emerged as the new lead market. This disruption was visible as a confusion in 2006 followed by the confession in 2007. The old core (voice) devalued to context and the Internet (earlier value-added data context) became the new core, to be followed by a rapid geographical value migration shown by the “superball” in Figure 1-2. Later, the U.S. became the leader in the software and computer science (data and algorithm) dominated mobile ecosystem and China became the largest device manufacturer and user of services, aiming at services lead as well.

- Connecting the world, i.e., infrastructure and B2B in the post-2007 era. Especially during the 2010s, the now redefined industry adapted to the new reality with “connecting the world to the Internet” as their value proposal and “connecting life” or “connecting economy” beyond and over that. The new prescription consisted of infrastructure and B2B, i.e., back to basics and business to business. Connectivity – “C” in ICT – was still the core, at least up to 2015, with symptoms of a confusion in the speeches of senior executives on the concept Internet of Things and how to make money out it. Instead of only small screens in handies, devices now came in all screen sizes, including sensors and actuators with no screens, and the devices may be less or not at all literally mobile. From pocket and hand mobility marched to living rooms, wearables, houses, cars and traffic, retail and services, cities, and industrial processes and systems, as an enabler for digital transformation. Connecting life and economy was the nascent era in mid-2010s approached with B2B to support corporate innovation.

![Figure 4-3 A retrospective one-pager of the 15 years of industry history.](image-url)
4.5.4 Sketching the global mobile industry strategy: structure alignment matrix

The strategy: structure alignment matrix zooms out from the MWC discourse and puts it in a bigger picture. Figure 4-4 sketches this global mobile industry matrix even if the axes have not yet been discussed in detail. The industry tried to build own local, new but me-too services over existing corporate and industry structures, services that already existed in the Internet, but now to be billed by use, based on an imagined mobile premium and control point in the value chain. This was slow and the resulting fragmented structure was an unattractive value proposition for developers of “things” because of production, transaction and opportunity costs. New leaders – Internet giants in Figure 4-4 – became from the shadow behind the visible leaders, they were tightly managed “one companies” which created new attractive structures, outflanking the mobile industry through the global Internet, as first noted by Vodafone’s Arun Sarin at MWC 2007. In the end, the industry returned to internal one company initiatives with in-market infrastructure consolidations and to B2B networking as visualized in Figure 4-4.

![Figure 4-4](image)

**Figure 4-4** The sketched strategic realignment matrix for the global mobile industry.

Table 4-6 uses the strategic slideruler, trident and attractor to feature the alignment matrix.

<table>
<thead>
<tr>
<th>Tool/Indication for the alignment matrix</th>
<th>Observations on MWCs 2001-2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Slideruler from classic to new strategies and structures with routes</td>
<td>Value-added local data services, based on an imagined billable value chain control point, for hardware-based voice-focused phones, outflanked by startups and adjacents over the Internet. In another words, the additive effort to build new strategy over classic structure was outflanked by using the Internet as the new structure.</td>
</tr>
<tr>
<td>(2) Trident with multiple strategies and structures</td>
<td>Focus on existing connectivity business (“C” in ICT) with additive services, modest success in new businesses, in-market restructurings.</td>
</tr>
<tr>
<td>(3) Attractor as the external source of new dynamics</td>
<td>Confessed slowness and lack of dynamics. Neither ability nor intent to create or leverage external spins, high clockspeed, global basin and strong coherence.</td>
</tr>
</tbody>
</table>

**Table 4-6** Explaining the alignment matrix using the strategic slideruler, trident and attractor.
4.5.5 The need to test and confirm the “holon”

The checklist in Table 4-3 shows that the mobile industry missed the Internet insight and after the Internet confession it was still too slow to compete against the distributed customer-driven innovation over global Internet platforms. That it followed classic-biased strategy and structure is still a hypothesis with indications – a “holon” – because no strategy maps have been drawn yet. An in-depth analysis is needed to test and eventually confirm this “holon”. This is done by zooming in to Finnish lead market, shortly out to the coeval ICT industry, and to Nokia as the then-leading global company, using the strategizing tools.
5 Market- and corporate-level analyses: zoom-in and zoom-out

Chapter 5 addresses the gaps in the global industry analysis and looks for evidence for the “holon” of classic-biased strategy and structure. It first zooms in to Finland as the manifold past mobile lead market. After that, it shortly zooms out to the adjacent coeval ICT industry to understand the prevailing management fashions, especially during the “mobile timeout” and after the “dotcom crash”. Thirdly, Chapter 5 zooms to Nokia as the then-leading mobile company.

5.1 The case study targets and methods

Finland as an advanced and competitive Communication Service Provider (CSP) market, a microcosm, is used as the lens to explain global observations. The rule of three (also known as The Rule of Three and Four, Henderson 1979:92-96; Sheth & Sisodia 2002) applies to the Finnish as well as other regional CSP markets globally. Thus it is sufficient to look at the three leading Finnish players Elisa, Sonera and DNA. Besides its history as a manifold lead and thus predictive market, the availability of data is a reason for choosing the Finnish fractal.

The first version of the Finnish CSP market analysis was made in the Business Transformation multi-client study in 1995-1996. This study – then based on cases, interviews, and groupworks – was formative for the kite strategy map as the nascent visual tool to describe transformation. I thank Aimo Eloholma and Pekka Rauhala (then executives at Telecom Finland) for preparing the first version of the kite strategy map diagrams (shown in Figure 5-1) during a groupwork by listing, classifying and aggregating key events, and mapping them onto the kite in 1996. Since that I have updated this description regularly.

In contrast to the global industry analysis, key events at singular corporate level on the Finnish market as well as in Nokia were easy to spot and log, both in time and retrospectively. These events are aggregated, coded, numbered and described by consistent diagrams. Such graphical constructs have been called fabula in narratology to show event structures and story comprehension (Swartjes & Theune 2006). While the MWC analysis relies on my firsthand and unique notes, the corporate level material is abundant. By von Ranke’s criteria – primary sources, narrative, outsighting – this kind of public data is secondhand. Notwithstanding this, for an unbiased view, the period after the year 2000 is based on the systematic reading of annual reports (history statements) and capital market day (CMD) materials (future statements), company presentations and other public sources. The event logs based on official corporate material represent what the corporations considered and selected as important. The selection of events for especially annual reports and CMDs is supposed to confirm their significance. There are typically only a few relevant phenomena in a year. MWCs have had a minor role in this data gathering but I have used lived experience to validate and prioritize the other sources I have used. For example, concerning the Nokia case, the corporate-level event log here is not essentially different to that in Doz & Wilson (2018). What makes the difference is not the internal data but what

65 Microcosm refers to fractality where the part (microcosm) reflects the whole (macrocosm) and vice versa.
happened in the outer fractal, together with the framework as the interpretation given to the events (Figure 3-1).

This follows the process of theory-driven thematic analysis: recognize a moment, see it as something, interpret it. Competences needed for this process are pattern recognition, planning and systems thinking to organize observations in to a usable system which is consistently used, and substantial knowledge which gives the theoretical sensitivity to recognize what is important, give it a meaning, and conceptualize it. Cognitive complexity is required to perceive multiple causalities and multiple variations over time and other variations together with the ability to conceptualize a system of relationships (Boyatzis 1998:7-9).

The local market analysis is followed by a short zoom-out to the global ICT industry. This industry analysis is originally grounded on my Strategic Realignment multi-client study in 2001-2002 which was also based on cases, interviews and groupworks. Back then, during the mobile timeout and after the dotcom crash, the prevailing management fashion in the leading firms was back to basics and Business To Business. This change of an era was well-covered in media thus I curated a review of these secondhand descriptions. Later, these difficult years for the Internet have been described in corporate histories.

Chapter 5 is finalized with a zoom to Nokia whose pre-Internet era intent since 1992 had been “focused, global, telecom-oriented and value-added” which in practice evolved to consumer mobility. The Nokia case rests partly on the MWC discourse but mostly – as the CSP market analysis – on systematic reading of related material. I also refer to books written on Nokia (Häikiö 2001, Steinbock 2003, Hyöty 2011, Nykänen & Salminen 2014, Sandelin & Partanen 2015, Lindén 2015, and Doz & Wilson 2018) and its competitors Blackberry (McNish & Silcoff 2015), Sony and Samsung (Chang 2008). In addition, I refer to the research of Vuori & Huy (2016) and to Siilasmaa’s book (2018) which came out when I was finishing this research. These are all secondhand sources but I use lived experience to validate and prioritize the sources I use and how I use them. The reasons for singling Nokia as the fractal are the same as for choosing the Finnish market: lead company, existing data. The thematic analysis process used in the Nokia case is similar to that in the Finnish market case.

5.2 The Finnish local market corporate-level analysis

5.2.1 The structure and formation of the local market

The three key players Sonera, Elisa and DNA have different histories and origins. Telecom Finland (renamed Sonera in 1998) was the former government monopoly for long distance and international calling and had taken care of local access in sparsely inhabited rural areas. When Sonera merged with Telia to form TeliaSonera in 2002, the Nordic-Baltic area was defined as its home market and it also had a broad presence in the emerging Eurasian market area. These two market areas are different and so are the countries inside them. The merger was followed with one company programs aiming at synergy and removing overlaps through recurring cost cuttings. The case study is scoped to the Finnish market excluding the parent company activities in Eurasia or (what TeliaSonera called) home markets around The Baltic Sea.
Finnet was the name for a loose group of regional operating companies (ROC) originally for local access. These ROCs had lobbied for deregulation since the 1970s. The countdown to the deregulation was the founding of Datatie Oy in 1985, a national product-market company founded by ROCs (to be named Finnet Group in 1996) to compete with Telecom Finland in data markets. This came a model how ROCs – Helsinki Telephone Company (HTC) as the by far biggest – reacted to each deregulatory step by founding a specialized company to fight in that market. Later (2000), in a series of events, the Finnet Group split into three. HTC and some large ROCs merged into Elisa which acquired the national product-market firms. Some other ROCs founded DNA first as a mobile Communication Service Provider launched in 2001. The third fragment was still called Finnet Group with smaller rural ROCs. This history of fragmentation and the messy matrix-like emergent structure (specialized product-market firms and original universal service ROCs) as the context explains much of the relentless focus to – and need for – “One Elisa” and “One DNA”.

DNA operated as an aggressive greenfield startup which benefitted from its historic local presence. From a focused mobile operator (2001) it transformed into a full-service player first (2007) by merging six fixed ROC networks and later (2010) by acquiring the largest local cable television operator Welho.

To drop in to literature, Henderson (1979) had argued that a stable industry consists of three players whose market shares relate 4:2:1. This balance was a rule of thumb, largely an experimental observation but even as such self-fulfilling. Henderson advised not to rock the boat, not to stretch but to retain the balance and to give up early. This Western equilibrium version is different compared to the dynamic Chinese version of three competing horses (Chen 1994, 1995). The metaphor of the needed third horse – i.e, Microsoft and Nokia – in the race was frequently used at mobile word congress MWC 2011.

Sheth and Sisodia (2002) revisited Henderson’s theory. According to their analysis, in a market equilibrium three or four generalists capture 70 % to 80 % of the market. An optimum share is 40 %. Three leading companies form an optimal solution from customer, competition and efficiency point of view. Three-player structure leaves customers a choice, keeps competition moderate and forces to efficiency. The rest 20 % to 30 % of the market is left for product- and/or customer-focused specialists. A generalist market share near 10 % becomes unsustainable. This makes these smaller companies to look for radical innovations and Sheth and Sisodia (2002) curated detailed rules on how behave on the markets of three or four.

The GSMA statistics shown at MWC 2015 Barcelona confirmed that the rule of three applies globally to CSP markets, not regarding exact market shares, but in the sense that local markets are dominated by three players.

Utterback asked (1994:98-99) if this kind of situation is the end of the history, an oligopoly of three main competitors: “Is there a way out of this highly capitalized, highly controlled, and generally uninnovative mode of production?” Fortunately, as Sheth and Sisodia posit, many factors such as regulation, patents, trade barriers, globalization, technological change, management ownership, and vertical-integration can disturb the balance which is not the end of the history.

The first 15 years of deregulation (1986-2000) were a successful era for the Finnish telco industry without dramatic changes in home market shares. The dynamics in the next 15 years

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66 In 1996, 46 different ROCs. The maximum number in the 1930s was more than 800.
was faster and less predictable despite that this era was more “business as usual”, “back to basics” and “same but better” fighting with flat revenues. This time it led to changes in market shares – the pie did not grow but became sliced anew. After 2010, mobile market shares stabilized at Elisa circa 40 %, Sonera 35 % and DNA 25 %.

Figure 5-1 The kite strategy maps and historic trajectories of the then-two players. Different up to 2000 as shown by the kite strategy maps. Left: Telecom Finland/Sonera (1998), right: Finnet (1996)/Elisa (2000). To improve readability, letters L, R, C and P denote leadership, resource, customer and process perspectives, respectively. Modified and updated from the Business Transformation multi-client study (1996).

From mid-1980s to late 1990s the industry was a loose duopoly of two sets of players. Their trajectories are visualized with kite strategy maps in Figure 5-1 with strategic thrusts, moves, eras and turns, i.e., patterns created by aggregating and classifying events. Figure 5-1 is adapted from the kite strategy maps drawn during the Business Transformation multi-client study in 1996 (unpublished customer material). The updates to the 1996 version add the global race (arrow 5 on the left) for Sonera and the national corporate restructuring of Finnet Group and the birth of Elisa in 2000 (arrow 4 on the right). The blue Internet fractal is still non-existent.

The left side of Figure 5-1 shows five patterns of strategic thrusts, moves, eras and turns at Telecom Finland/Sonera: (1) As the anticipation and reaction of industry deregulation, (2) a new business structure was established. (3) Three major technology initiatives: mobile, Intelligent Networks (IN), and broadband (Asynchronous Transfer Mode, ATM). (4) National restructuring to remove the regional organizational level in the early 1990s. (5) The global race, i.e., visionary globalization efforts in the late 1990s by horizontal services and enablers (Zed, Plaza, SmartTrust, Juxto) and simultaneous geographical expansion (Russia, USA, Turkey).

The corresponding diagram for Finnet/HTC/Elisa is on the right side of Figure 5-1. For a long time, it had (1) visioned and lobbied for industry deregulation and – when that happened – it utilized (2) the opening new market opportunities (data, long-distance, international, mobile) by (3) establishing new focused business units for each of them. The most important of these was the mobile company Radiolinja, celebrated by the reportedly world’s first GSM call in July 1, 1991, by the Finnish Prime Minister Harri Holkeri. (4) The national restructuring was delayed to year 2000.

The original 1996 version of Figure 5-1 was made intuitively based on event logs listed on a flipchart, using the event classification forms I had prepared, and applying the technology, business and market knowledge of the telecom executives. Tables 5-1 and 5-2 are
retrospective reconstructions of this process using thematic analysis. Detected and aggregated events (by the executives) are classified as patterns, and summarized and coded in Tables 5-1 and 5-2. The colors red, green and blue refer to business/corporate, network/industry and Internet scope, respectively. Proactivity vis-à-vis reactivity decodes the thrust.67 The direction denotes the orientation of the thrust, move, era or possible turn.

<table>
<thead>
<tr>
<th>Years</th>
<th>Pattern</th>
<th>Scope</th>
<th>Thrust and direction</th>
</tr>
</thead>
<tbody>
<tr>
<td>1985</td>
<td>(1) Countdown to industry deregulation</td>
<td>Green</td>
<td>Proactive, outside-in</td>
</tr>
<tr>
<td>1985</td>
<td>(2) New corporate structure</td>
<td>Red</td>
<td>Proactive, Inside</td>
</tr>
<tr>
<td>Late 1980s</td>
<td>(3) Visionary technology initiatives: mobile, Intelligent Networks, broadband</td>
<td>Green</td>
<td>Proactive, inside-out</td>
</tr>
<tr>
<td>Early 1990s</td>
<td>(4) National corporate restructuring</td>
<td>Red</td>
<td>Reactive, inside</td>
</tr>
<tr>
<td>Late 1990s</td>
<td>(6) Visionary dual race for global: horizontal services/enablers, geographic expansion</td>
<td>Green</td>
<td>Proactive, outside-in</td>
</tr>
</tbody>
</table>

Table 5-1 Sonera predecessor aggregated event log 1985-2000.

<table>
<thead>
<tr>
<th>Years</th>
<th>Pattern</th>
<th>Scope</th>
<th>Thrust and direction</th>
</tr>
</thead>
<tbody>
<tr>
<td>1980s</td>
<td>(1) Vision and lobbying for deregulation</td>
<td>Green</td>
<td>Proactive, outside-in</td>
</tr>
<tr>
<td>1985</td>
<td>(2) Opening new markets</td>
<td>Green</td>
<td>Proactive, outside</td>
</tr>
<tr>
<td>1985-2000</td>
<td>(3) New structure with focused units</td>
<td>Green</td>
<td>Proactive, inside-out</td>
</tr>
<tr>
<td>2000</td>
<td>(4) National corporate restructuring</td>
<td>Red</td>
<td>Reactive, inside</td>
</tr>
</tbody>
</table>

Table 5-2 Elisa predecessor aggregated event log 1985-2000.

The transformation before year 2000 – described in Figure 5-1 – was slow but successful in the sense that telcos did not drift to a crisis but were able to act proactively. Even more; a world-class industry led by Nokia co-evolved. Telcos did not oppose deregulation, they saw it as an opportunity not as a threat, and unavoidable. The relatively slow process left plenty of time to react and act. Things went largely as they were planned or better. The big difference was that for the state-owned Telecom Finland/Sonera the driver was globalization, for the private Finnet (split into Elisa in 2000 and DNA in 2001), it was deregulation.

Around year 2000, Sonera invested 3.7% of its revenue into R&D including startups SmartTrust for secure mobile transactions, Zed mobile portal, Juxto Application Service Provider for B2B, and the Sonera Plaza Internet portal. Nokia collaboration in Wireless Application Protocol (WAP) and Multi-media Messaging Service (MMS) was highlighted (Annual Report 1999:58). In addition to these service-oriented horizontal startups and enablers, network investments had been made in Turkey, USA and Russia.

Sonera’s goal was global growth that leveraged the mobile networks as the platform. Services such as Zed and Plaza and enabling technologies such as SmartTrust were “horizontal tigers” and network investments were the “geographical dragon” in the global race (Jeannet 2000; Bryan et al. 1999). Another reason for the company split was to attract talented people by stock options. Sonera’s vision was huge, and as the future shows, basically correct, it even conceived (what it is now called) Internet of Everything.68 The problems were

67 The original version used Ansoff’s five-level coding which is simplified here and in the following analyses to two levels. Five levels require a “thrustmeter”, i.e., separate graphics on the changing thrust on the time axis.
68 Sonera annual report 2000: “… mobile devices are used mainly for talking to other people, and the most popular value-added service is the basic text messages which people send to one another. The popularity of value-added services is nevertheless increasing by the day, and in the years ahead the bulk of monthly use will
the early timing and the lack of an Internet insight together with an incoherent strategy and structure, i.e., building new strategy on classic industry structure.

The success of the 1980s and 1990s was dependent on deregulation, bold technology initiatives and related business development. Visionary technology initiatives and the deregulatory process formed a virtuous circle. The most important driver was the breakthrough in mobile technology (not yet in services) which in the 1990s started to replace the Plain Old Telephony System (POTS) voice business and later in the 2010s also the wired data business.

5.2.2 Sonera

In five years time from 1995 to 1999, Sonera’s revenue had doubled due to the mobile business which had tripled. Employment had risen from 6500 (1995) to 9500 (1999) to 11000 (2000). Finland was the global lead market in mobile voice penetration at 65% (2000) and 73% (2001). In 1999, Sonera parent company revenue was €1,85 B with a 21% in profit. Revenue grew still to €2,06 B in 2000 with the mobile revenue up to 15%. Sonera’s market value reached €60 B in winter 2000, approximately four times that of Telia (the renamed TeliaSonera) in 2018.

In 2001, things abruptly changed. Sonera’s event log from 2001 to 2013 is in Table 5-3 (this case study was made in 2014). New strategic priorities were continued organic growth, improved profitability and cashflow, restructured balance sheet, maintaining innovation and growth opportunities, and customer focus with One Sonera. Service investments were scaled down, e.g., Sonera sold the directory, its only profitable service. Sonera declared that it “intends to retain its strong brand in Finland, but abroad the focus is shifting from building a consumer brand to services and solutions that are offered to companies”. The same B2B conclusion was made by the mobile industry at MWC (3GSM) 2001, epitomizing the post-bubble management fashion in ICT industries.

The attempted geographical expansion to Germany by a 3G network license became fatal for Sonera. New CEO was appointed in fall 2001. The new reality required to focus on cashflow, cost management and disposal of non-core assets.

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69 Annual report 2001: “Mobile communications breakthrough takes a timeout” and “UMTS license auctions caused many mobile communications operators in Europe to become heavily indebted. The lack of GPRS terminal equipment delayed the appearance of new services on the market. Launches of UMTS services too are being deferred from previous start-up estimates owing to the delay in available technology.”

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2001 Fast five-year growth behind. 3G expected to continue this growth. German 3G license auction. Autumn: New Sonera CEO. Mobile timeout declared. One Sonera. Sonera as the market leader with 60 % of Finnish mobile markets and 3.7 % of revenue invested in R&D.


2004 Cost cutting improves profits when revenue stays flat. Merger synergy targets declared as being met. Centralized scale advantages highlighted. Finnish mobile market share declines to 46 % but broadband tornado reaches 242 k homes. Hypercompetition begins driven by MVNOs: number portability, churn, price erosion. “Tele” as the discount fighter brand.


2007 New CEO with new priorities: Sweden from past fixed monopoly into triple play and IPTV which means striving for leadership in new television, Eurasia, B2B in Sweden and Finland, service excellence measured by customer satisfaction, cost. Customer-centricism and performance management highlighted. The vision of digital home to protect the fixed asset in Sweden. Broadband packages aggressively marketed in Sweden and television seen as the platform for future home services. 60 % of Swedish voice still in fixed network, in Finland only 20 %. Finnish broadband user base grows to 473 k where it sustains and mobile market share declines to 40 %.

2008 Restated six priorities: world-class service company with better customer satisfaction, network quality, best-in-the-industry cost structure, new services for fixed network voice customers, profitable growth in Eurasia and sales organization. Eurasia as the engine of growth. Because there are no developed fixed networks and the mobile penetration is still small, Eurasia is seen as the mobile market both in voice and data. Convergence and ecosystems issues in developed markets. The year of iPhone and mobile data explosion. The economic downturn with smallish impacts.

2009 Priorities: world-class service and customer experience, network quality and costs, and for the first time, leadership in new services arises as a theme. Fixed network priority in home markets. Mobile billing is seen as an issue. R&D has now fallen below 1% of revenue and Finnish mobile market share continues to decline.

2010 Profiled as leader in 4G networks. Internet seen as value-added services. Emerging market growth takes on increased data space in the annual report. Home market seen as mature and highly price-competitive. Smartphones and their services boom. Other than voice services make 22,8 % of the revenue but in Sweden 26,2 %. Risk analysis (the T in SWOT) and Six Sigma highlighted.

2011 Decision to invest SEK 5 B into Swedish fiber and SEK 3 B in fiber elsewhere as well as to upgrade 800 000 Swedish ADSL connections up to 30-60 Mbps. In Eurasia, the goal is leadership in mobile data because of few fixed networks. The next big thing that had been waited for so long finally appears in developed markets and it is the explosion of the smartphones and tablets. Finnish revenue sinks -7 % in Mobile and -9 % in Broadband (mostly due to revalued Swedish currency vis-a-vis Euro). Emerging market growth balances the developed home market dive.

2012 Eurasian growth balances the decline in developed markets. Finnish Mobile and Broadband businesses sink both -8 % (in local currency -4 %) and the mobile market share is now 34 % (another source says 33 %). Refreshed priorities: Best offerings, new pricing model and cost. In offerings, fixed networks highlighted with services such as HBO and Netflix. In pricing the focus to be changed to speed and the amount of data. Mobile data has grown radically but not the revenue and this trend seems to continue. New cost savings and downsizing program launched. R&D sinks to below 0,4 % of revenue.

2013 Goal to “meter and bill” mobile data restated by the new CEO.

Table 5-3 Sonera event log (annual reports, capital market days, other public sources).

It became clear that 3G was a hype which really did not exist yet. Years later it turned out that the mobile industry alone was never able to deliver this technology, Steve Jobs was needed for help – even if the first iPhone did not have 3G. Smartphones and Internet services created by adjacents and startups became the drivers and saviors for the mobile industry. This remark is important when imagining the future Internet Everything where 5G in the late 2010s is in the expected savior role and wait state as 3G was in the early 2000s.
The broadband explosion began. In 2002 Sonera had a 60% market share in mobile with 2.5 M customers. Compared to that, the number of ADSL customers was only 60 k or about 2% of mobile subscribers. Then the ADSL boom started. Instead of immature and expensive mobile services consumers wanted the Internet which set the expectations for mobile services.

Sonera merged with Swedish Telia in Dec. 9, 2002. TeliaSonera CEO announced that unprofitable projects will be discontinued and risk management honored. Three pillars were recognized: customers, personnel, profitability. Not innovation. A change from technology-based to customer-based structure was declared but TeliaSonera was organized into Mobile vis-à-vis Broadband. Nordic and Baltic area was defined as the home market. The other market areas were Eurasia, Russia and Turkey. This was still the geographical expansion route.

The merger was the kick-off for years of cost saving and operational excellence programs, flat or declining Finnish revenue and shrinking market share up to 2010. First focus was synergy, in practice the stack of networks, platforms, processes and procurement. Customer focus was operationalized by customer satisfaction and engaging customers in service development.

In 2003, the ease of use and simplicity became the Vision 2010. This vision was an omen because it was delivered by iPhone four years later. Control and corporate governance got increased attention. The broadband tornado was in full swing. The number of ADSL subscribers had risen to 150 k but still presented only 6% of mobile subscribers where market penetration was now 90%.

2004 was the second flat year of revenues in a row but with improving profits due to cost cuttings. “We see simplicity and service as the most important tools for creating long-term growth and value for our customers and our shareholders.” Merger synergy targets were declared as being met. Cost reductions continued. Another focus was to strengthen market position. Centralized scale advantage and synergies were highlighted with a new structure and headquarter role.

In 2005, the duality in the business and market definition came clearer with renewed cost focus in mature markets and growth in emerging markets. TeliaSonera’s businesses were described by the Boston Consulting Group portfolio matrix. Home markets were the mature Nordic and Baltic areas and growth markets were Eurasia, Russia and Turkey. Home markets required acquisitions for building market strength and cost reduction remained a top priority. New cost saving programs were introduced in Sweden and Finland. Finnish market had shrunken due to hypercompetition driven by Mobile Virtual Network Operators. This required strong marketing and segmentation which included the discount fighter brand Tele using the old name of Sonera from the 1980s.

In 2005, the Internet was defined as the fixed broadband. A second key observation was adjacency. A third one was to combine local strengths with global scale. Combined “IT” and “C” solutions in ICT were offered, mobile office for businesses, SurfPort portal for consumers. The long-lasting theme strategic pricing was introduced. Simplicity was again highlighted.

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70 “New actors from neighboring industries are also present. The nature of competition changes as the borders between different industries become lower and increasingly overlapping.”

71 “The future is in mobile services, broadband for consumers and internet data communications for businesses, which are complemented by Internet-based services, managed services for businesses and content services. This
Year 2006 meant a tailwind with continued cost-cuttings. The number of broadband users had grown to 412 k. E-commerce and music downloading were noted. This year was considered as the breakthrough year for mobile value-added services. In B2B, Cygate, Crescom and DataInfo were acquired. New structure divided business into Mobile, Broadband, Integrated Enterprise Services (IES) and Eurasia but IES was soon restructured to a sales organization.

In 2007, the new CEO set new priorities: Sweden from past fixed monopoly to a triple play of fixed, mobile and television with IPTV striving for leadership in the new television; Eurasia; B2B in Sweden and Finland; service excellence measured by customer satisfaction; and cost. Customer-centricism and performance management were highlighted. The vision of digital home was introduced to protect the Swedish fixed asset which brought one-third of the corporate free cashflow. Broadband packages were aggressively marketed in Sweden and television was seen as the platform for future home services.

Year 2008 restated the strategic priorities: world-class service company with better customer satisfaction; network quality; best-in-the-industry cost structure; new services for fixed network voice customers; profitable growth in Eurasia; and sales organization. The seemingly defensive strategy did not highlight the mobile Internet and Sonera’s share in new old lead market Finland continued its downtrend. Eurasia was seen the engine of growth. Without fixed networks and with low mobile penetration, Eurasia was conceived the mobile-only market for voice and data. In developed markets 2008 was the year of iPhone and mobile data explosion. There was a big difference between Sweden and Finland in 2008: 60 % of Swedish voice still used the fixed network, in Finland only 20 %.

In 2009, the strategic priorities were world-class service and customer experience; network quality and costs; but for the first time, leadership in new services appeared as a theme in the annual report. Fixed network enjoyed priority in Swedish markets. Mobile billing was more and more an issue. R&D fell below 1% of the revenue and Finnish market share continued to decline.

In 2010, TeliaSonera profiled itself as the leader in 4G networks where the Internet was seen as a value-added service. Emerging market growth took an increasing role because home markets were mature and price-competitive. Smartphones and their services boomed. Non-voice services made 22,8 % of the revenue, but in Sweden, 26,2 %. Risk analysis and quality were highlighted.

In 2011, TeliaSonera decided to invest into fiber to upgrade Swedish ADSL. The Eurasian goal was leadership in mobile data because there were few fixed networks. The next big thing that had been waited for so long had finally appeared in developed markets and it was the explosion of the smartphones and tablets. Finnish revenue sank ~7 % in Mobile and ~9 % in Broadband. Emerging market growth balanced the developed market dive.

In 2012, the business stayed flat. Eurasian growth balanced the decline in developed markets. Finnish Mobile and Broadband sank both ~8 %. Refreshed priorities were the best offerings, new pricing model and cost. Fixed networks were highlighted with HBO and Netflix. The pricing focus was changed to the speed and the amount of data which had radically grown but not the revenue. The trend seemed to continue so that in five years the average amount of mobile data was expected rise from 0,5 to 3 gigabytes a month (the Finnish average reached 16 gigabytes in 2016). A new cost saving and downsizing program is by far a less complex world of services than what we have offered in the past. The challenge and opportunity lie in bringing simplicity to our customers and reducing complexity inside TeliaSonera."
was launched. R&D has sunken below 0.4% of revenue – one-tenth of Sonera’s R&D in 2000 – but R&D was at the same level at Elisa and zero at DNA. Operators deleted their R&D during the moment of discontinuity and huge value migration.

In 2013, a new organization was announced. It divided TeliaSonera businesses into three areas – Sweden, Europe and Eurasia – to separate the Swedish legacy from other lead markets.

The series of events are aggregated and coded as business thrusts, moves, eras and possible turns, i.e., patterns, summarized in Table 5-4 and drawn on the kite strategy map in Figure 5-2. The colors red, green and blue refer to business/corporate, network/industry and Internet scope, respectively. Proactivity vis-à-vis reactivity decodes the thrust. The direction denotes the orientation of the thrust, move, era or turn.

<table>
<thead>
<tr>
<th>Years</th>
<th>Pattern</th>
<th>Scope</th>
<th>Thrust and direction</th>
</tr>
</thead>
<tbody>
<tr>
<td>2001-2007</td>
<td>(1) Consolidation and cost cutting due to merger and market</td>
<td>Red</td>
<td>Reactive, inside</td>
</tr>
<tr>
<td>2004-2005</td>
<td>(2) Hypercompetition due to MVNO</td>
<td>Green</td>
<td>Reactive, outside-in</td>
</tr>
<tr>
<td>2003-2006</td>
<td>(3) Broadband tornado due to ADSL and PC Internet, later IPTV</td>
<td>Blue</td>
<td>Reactive, outside-in</td>
</tr>
<tr>
<td>2000s</td>
<td>(4) New competitors and complementors due to Internet</td>
<td>Blue</td>
<td>Reactive, outside</td>
</tr>
<tr>
<td>2007-</td>
<td>(6) Mobile broadband tornado due to 3G and iPhone</td>
<td>Red</td>
<td>Reactive, inside</td>
</tr>
<tr>
<td>2007-, 2011</td>
<td>(7) Mobile and fixed broadband network investments</td>
<td>Blue</td>
<td>Reactive, outside-in</td>
</tr>
</tbody>
</table>

**Table 5-4** Sonera aggregated event log 2001-2013.

**Figure 5-2** Sonera trajectory 2001-2013. Letters L, R, C and P denote leadership, resource, customer and process perspectives, respectively.

Table 5-4 and Figure 5-2 are explained as follows:

(1) 2001-2007: Post-hype mobile voice saturation 2001-2007 with a delayed jump to the next S-curve, and while waiting for 3G, the focus was on post-merger consolidation and cost-cutting programs. This was a permanent corporate issue.
(2) 2004-2005: Hypercompetition caused by low-cost Mobile Virtual Network Operators (MVNO). This was a market-driven issue; according to Porter, a hypercompetition is caused by the lack of innovation.

(3) 2003-2006: At the time of the mobile hypercompetition, the adjacent fixed broadband exploded. Fixed broadband tornado remained stealth in the sense that its significance for mobile was not conceived because it was seen as a different business. This was an externally generated and Internet-driven issue.

(4) 2000s: New powerful competitors and complementors were born and raised. This was the reason my mobile world congress 2006 report as well as Arun Sarin in his 2007 keynote speech concluded that the Internet had won the game. Internet users did not move over to mobile services and business models; instead, Internet services, companies and their business models conquered mobile networks. The new expanded blue strategy and structure space emerged.

(5) 2006: B2B ICT services were developed and deployed in collaboration with leading IT firms and by smallish acquisitions.

(6) 2007-: The 3G boom started as mobile Internet explosion driven by smartphones and tablets. This was an externally generated phenomenon which required network investments.


There were major differences between Sonera and TeliaSonera. In late 1990s, Sonera had been broken into focused businesses in the anticipation of global breakthroughs. In 2001, this vision turned to customer-centricism, process and structural management with one company initiatives.

TeliaSonera as the corporate parent had a dual strategy. The Nordic and Baltic home market area concentrated in cost savings (especially in Sweden and Finland) and the emerging Eurasian market area was responsible for the mobile growth. Sonera navigated through the hypercompetition era with, e.g., a so-called discount fighter brand.

In 2000 Sonera´s businesses were divided into Mobile & Media vis-à-vis Telecom. This was a difference to the post-merger TeliaSonera which divided its businesses into Mobile vis-à-vis Broadband. In 2007, DNA and Elisa chose 3G/4G as spearheads but TeliaSonera´s published corporate priority was to protect its Swedish fixed asset by broadband television as their envisioned platform for digital home. In addition, TeliaSonera pushed “meter and bill” for mobile data, unlike the competition which conformed to time-based flat rates.

TeliaSonera stated time after time that mobile broadband is for emerging markets without legacy fixed networks. This was a key discourse theme also at mobile world congress MWC 2006: fixed-mobile convergence is for developed markets and mobile-only suits to emerging markets. This created a discrepancy because Finland had been a progressive market in mobile voice and was again the lead market in mobile broadband whereas Telia in Sweden wanted to protect its fixed network assets as a separate business from mobile cannibalization. Due to historic basically political reasons, Sonera had only scattered Finnish rural fixed networks and their goal was rather to abandon these unprofitable access lines in favor of mobile connections.
5.2.3 Elisa

The description of Elisa’s transformation is straightforward because all documentation during 2001-2013 is based on the same three objectives and phases: integration into One Elisa (2003-, in practice, relentless operational excellence), strengthening market position in core markets (Finland, Estonia), and the search for new growth markets. These phases appear consistently as three arrows in Elisa’s communication and resemble the trinity of costs and operations, markets and customers, and innovations; in this order and priority. The focus was on the two first phases. Only after 2007 the third phase started to get some attention during the smartphone 3G/4G tailwind and the rhetoric slightly shifted towards leveraging disruptions. Elisa’s event log from 2001 to 2013 is shown in Table 5-5.

<table>
<thead>
<tr>
<th>Year</th>
<th>Event Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>2001</td>
<td>Fast five-year growth behind. 3G expected to continue the growth, last remnants of hype still left in portals, LBS, M2M and M-Commerce. Restructuring and consolidation begin.</td>
</tr>
<tr>
<td>2002</td>
<td>Intent to take market leadership from Sonera that had merged with Telia. Execution, integration and profit mindset. Non-core businesses sold. Market growth stalls from 20% to 3%, expected to return to traditional 7%. Mobile business dives to a temporary loss partly due to the exit of Telia from Elisa’s network. Multi-media messaging (MMS) seen as the key value-added service of 3G and as the continuum to text messaging (SMS).</td>
</tr>
<tr>
<td>2003</td>
<td>Back to profitability by operational, cost and sales focus. No engines of growth. New CEO with one company priority: profitability, customer orientation and simplification (billing &amp; customer operations, product management, network and IT optimization, procurement, selling non-core assets such as the headquarter). Focus on Finland as the leading full range telecom vendor. Germany to be divested as non-core. Very fast fixed broadband growth begins and lasts four years.</td>
</tr>
<tr>
<td>2005</td>
<td>Fixed broadband grows very fast but remains unexplained as the platform for adjacents and startups that take over the mobile services in the future. Mobile handset services bundle presented in preparation for bundled competition from 2006. Fujitsu and Cisco collaboration in B2B.</td>
</tr>
<tr>
<td>2006</td>
<td>Mobile hypercompetition calms down, churn halved. Initially, 3G services still remain unclear, MMS turns out as marginal. Mobile TV pushed. Later the same year 3G had a good start, then understood as mobile Internet driven by smartphones.</td>
</tr>
<tr>
<td>2007</td>
<td>Internet driving new services. Focus on the finally exploding 3G due to smartphones. Acquisitions and new services rise to the agenda.</td>
</tr>
<tr>
<td>2008</td>
<td>Market leadership. 3G temporarily halts the decline of mobile ARPU at €30 but now the decline continues again. B2B packages for fieldwork, office and customer solutions. Mini laptop episode (with dongles) precedes the later breakthrough of tablets.</td>
</tr>
<tr>
<td>2009</td>
<td>Business reporting from access technology (mobile vs. fixed) to customers (consumer vs. business). Experiments with mobile marketing. Targeted acquisitions. Finland regains the global lead market position this time in mobile broadband. Fixed broadband saturates (2007) but is now rejuvenated by IPTV/Video On Demand (VOD) television bundling. Economic downturn. Operational excellence focus continues and now customer self-service had made a breakthrough.</td>
</tr>
<tr>
<td>2010</td>
<td>Productivity and disruptions as dual strategy. Smartphones drive growth. New: Vahti home security service. Videra (videoconferencing) and Appelsiini (data center) acquisitions.</td>
</tr>
<tr>
<td>2012</td>
<td>Smartphones drive growth. Customer service excellence rewarded. Elisa is able to grow even when peers (European telcos) had contracted. Economic downturn. Leveraging connectivity to broader B2B ICT services (customer interaction, visual communications, cloud). New: 4G. Payment services.</td>
</tr>
<tr>
<td>2013</td>
<td>Services (not networks and geographical expansion) declared as the source of international growth (July 2013).</td>
</tr>
</tbody>
</table>

Table 5-5 Elisa event log (annual reports, capital market days, other public sources).

The integration into One Elisa had started some years earlier. In July 2000, Helsinki Telephone Company (HTC) was renamed Elisa. It had acquired Datatie and its Radiolinja (the mobile company) ownership was now over 90% and the final share redemption procedure had started. International operator FINNETcom was acquired, logistics and real estate services outsourced, Direktia directory and Kolumbus Internet businesses incorporated. Elisa resigned from Finnet Association.
Before this, in five years from 1996 to 2000 the revenue had grown 3.3-fold from €374 M (local HTC) to €1244 M (including the nation-wide Elisa with operations in Baltic, Germany, and the global software company Comptel) and the market capitalization had grown to €2,2 B. Profits were up from €19 M to €117 M (1999) and €90 M (2000).

Then the market abruptly changed. There was little or even negative mobile growth after year 2000. Financial management with opex and capex and ARPU as Key Performance Indicators (KPI) became crucial. As conceived in 2002, the industry lacked a growth engine it had used to. In addition, marketing, selling and service capabilities (jointly named Customer Relationship Management, CRM) made a difference first during the hypercompetition era 2004-2005 and then in the smartphone 3G/4G boom after 2007.

In four years starting in 2002, the fixed broadband tornado grew from 81 k to 496 k subscribers. Then it saturated due to competition from mobile. By bundling connectivity with IPTV entertainment it slowly grew again in the early 2010s. This broadband tornado remained stealth in the sense that its significance for mobile was not conceived because it was seen as a different business. It was left largely unnoticed that wireline Internet services had a ten-year lead in consumer services and this bridgehead was later used to conquer the mobile markets.

In five years time from 2005 to 2009, Elisa’s radical growth tripled the customer base in broadband and doubled in mobile. Except that this growth did not appear in revenues. Mobile market leader position was gained in 2008 when Elisa and Sonera were approximately of the same size. Soon after that Finland regained a global lead market position for the third time, now in the mobile broadband penetration driven by fierce 3G competition, rapid increase of its coverage and declining prices. Economic downturns may be invisible or act as accelerators for technology breakthroughs – as in the case of radio in the early 1930s and mobile phones in the early 1990s – but they were to some extent negatively felt at Elisa in 2008 and again in 2012.

The 3G breakthrough in 2007 had delayed from what was expected and when it finally happened it took the form of the mobile Internet with little value capture for telcos. In the beginning, 3G services were unclear for both sellers and buyers. One idea was multi-media messaging (MMS). Another was television. Instead of the mobile Internet, 3G services were called mobile value-added or new services. First time the mobile Internet was mentioned in late 2006 with the insight that mobile users are going to use familiar Internet applications. Before the iPhone era, Nokia’s multi-media computer was the term used instead of the smartphone. Then the 3G boom finally started, driven by smartphones and mobile Internet services. A transient episode of mini laptops with dongles (3G USB modems to provide the Internet connection) preceded the tablet boom.

The series of events are aggregated and coded as business thrusts, moves, eras and possible turns, i.e., patterns, summarized in Table 5-6 and drawn on the kite strategy map in Figure 5-3. The colors red, green and blue refer to corporate, network/industry and Internet scope, respectively. Proacticity vis-à-vis reactivity decodes the thrust. The direction denotes the orientation of the arrow describing the thrust, move, era or turn.
Table 5-6 Elisa aggregated event log 2001-2013.

Table 5-6 and Figure 5-3 are explained as follows:

(1) 2001-2007: Lack of a growth engine because 3G delayed from what was expected. Focus on post-merger operational excellence and technology convergence by one company initiative. This was a corporate issue.

(2) 2004-2005: Hypercompetition caused by low-cost Mobile Virtual Network Operators (MVNO). Customer churn (the leaving customers) rose momentarily up to 47%. Acquisition of Saunalahti MVNO to strengthen market position and calm competition.

(3) 2003-2006: At the time of the mobile hypercompetition, the adjacent fixed broadband exploded. This tornado remained stealth in the sense that its significance for mobile was not conceived because it was seen as a different business. This was an externally generated and Internet-driven issue.

(4) New powerful competitors and complementors were born and raised. This was an externally generated and Internet-driven phenomenon which created the new expanded blue strategy and structure space.
(5) B2B ICT services were developed and deployed in collaboration with leading IT firms and by smallish acquisitions.

(6) 2007-: Mobile Internet explosion.

(7) 2007-: Mobile Internet explosion required network investments.

(8) In the 2010s, Elisa launched additional (to earlier IPTV) but me-too local consumer offerings (e.g., surveillance, e-book).

Mobile world congress (MWC) analysis in Chapter 4 highlights classic elements of strategy: finances and marketing, industry value chain and cluster, portfolio and process management with enterprise architecture, and lack innovations. In the case of Elisa, the focus on finances, marketing and selling gets a rational explanation. Financials were first dominated by cashflow, then shareholder value in the absence of growth. Already Helsinki Telephone Company had excelled in marketing and sales by establishing focused firms for new market opportunities which explained its complex structure. The logic behind portfolio and process management was the post-merger one company initiative. Unlike in the 1990s, innovation was no more high on the agenda, just at the time it happened outside the mobile industry.

Despite the talk about ICT convergence, the traditional telco was well-defined with a clear identity of providing connectivity in the value chain with known industry peers to benchmark. Because of this and the rule of three, market leadership did matter. Operational excellence in processes, procurement, IT and networks together with structural simplification and divestments were permanent themes. Revenue remained flat for years and cutting costs was essential. In general, this was the period of increasingly inward-looking ICT management methods simply because there was a high demand for these. Wind turned behind the tail due to smartphones, tablets and 3G/4G after 2007. In 2009 reporting was changed from mobile versus fixed networks to consumer versus businesses customers but already in 2007 an offering bundled mobile with fixed broadband.

Elisa’s stock reached its maximum value in February 2000 (€41,50), the minimum in August 2002 (€4,90), a new local maximum in January 2007 (€22,05) and a new local minimum in March 2009 (€9,96). It was €32,77 in the end of 2018.

Elisa as an incumbent succeeded first by its relentless drive towards operational excellence through One Elisa initiative and later because of aggressively leveraging the smartphone 3G tailwind. In ten years, mobile ARPU more than halved from over €40 to €16. In addition, the externally generated free – both gratis and permissionless – information-based business models of the mobile Internet were very different from the “meter and bill” imagined for 3G ten years earlier. This was answered by bundled flat price packages based primarily on time instead of the amount or speed of data. Elisa proved that it is possible to make healthy profits in saturated competitive advanced markets unlike some European telcos explained at MWCs during the 2010s. The case also epitomizes the lack of innovation which was as an industry-wide issue and a cause of frequent complaints and envy at MWCs toward Internet firms.

Concerning both Sonera and Elisa, a striking difference between pre-2000 and post-2000 eras – i.e., Figure 5-1 vis-à-vis Figures 5-2 and 5-3 – is that the strategies that had been so different became more similar, “same but better”. But some differences between Elisa and Sonera came from Sonera being a part of TeliaSonera:

- TeliaSonera’s a dual corporate strategy conceived the lead markets as mature with cost focus. This was based on classic portfolio management.
- TeliaSonera corporate management – as the MWC 2006 discourse – saw mobile broadband primarily as an emerging market solution because these markets did not have fixed networks. The delay in conceiving the mobile broadband hit Finland where Sonera initially lost market share to nimble local competitors.

- TeliaSonera structure was based on access technologies. In Sweden, TeliaSonera wanted to protect and leverage its fixed network by the digital home vision. In Finland, Sonera had only scattered rural fixed networks.

5.2.4 DNA

DNA started as a focused mobile operator in 2001. After the loss-making mobile hyper-competition era it was restructured by merging with the fixed network businesses of six Regional Operating Companies (ROC). The new DNA as a full-service telco started in July 2007 with over 2 M customers. DNA’s event log is summarized in Table 5-7.

<table>
<thead>
<tr>
<th>Year</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>2001</td>
<td>DNA launched as a mobile operator just before the 3G timeout.</td>
</tr>
<tr>
<td>2003</td>
<td>0.76 M mobile customers.</td>
</tr>
<tr>
<td>2004</td>
<td>Hypercompetition begins driven by MVNOs: number portability, churn, price erosion, discount brands.</td>
</tr>
<tr>
<td>2005</td>
<td>Insight that DNA needs to be restructured into a full-service telco.</td>
</tr>
<tr>
<td>2006</td>
<td>Hypercompetition ends, churn halved.</td>
</tr>
<tr>
<td>2007</td>
<td>New DNA with over 2 M customers formed with merging six fixed ROC networks. Profiled as an energetic, positive growth company, light and fast. Focus on connecting Finland to the Internet. Punctual outsourcing: Customer services, finances, installations, maintenance, IT support.</td>
</tr>
<tr>
<td>2008</td>
<td>Growth 20 %. Mobile broadband as the big thing. 3G with laptop dongles followed by smartphone boom. Highlighted as the service company driven by culture and values – “fast, bold and straightforward”.</td>
</tr>
<tr>
<td>2009</td>
<td>Flat revenue. Acquired two television licenses. The goal to be the leading television actor. Values highlighted. Reorganization into consumer and B2B businesses. One DNA.</td>
</tr>
<tr>
<td>2010</td>
<td>The growth returns. Still one-third market share of the mobile broadband. The leading cable television operator Welho acquired. Expressed need to accelerate growth and transform from a challenger to the leader. The television business to be based on hybrid that combines linear cable, antenna network and on-demand broadband services. Ecosystems discussed and visualized as devices, mobile broadband, social media and cloud services with mutually reinforcing positive feedback and feedforward connections.</td>
</tr>
<tr>
<td>2011</td>
<td>Growth 5.4 %. Forte Netservices acquired for B2B. Mobile switch to substitute PBXs. Network investments highlighted. DNA to disrupt the copper-based ADSL by 4G. Fixed cable and networks updated up to 200 Mpbs speed for customers. The insighting and strategy process that had started in last year continued.</td>
</tr>
<tr>
<td>2012</td>
<td>The growth was 5.7 % in 2012. DNA market shares 25 % in mobile, 38 % in cable, 19 % in fixed and 13 % in fixed voice. Insourced the customer service of 500 people that was outsourced in 2007. New headquarter. DNA insight published.</td>
</tr>
<tr>
<td>2013</td>
<td>Speculations about IPO and/or selling DNA, offers are rejected in July 2013. New CEO.</td>
</tr>
</tbody>
</table>

Table 5-7 DNA event log (annual reports, capital market days, other public sources).

The new DNA profiled itself as a growth company. Initially, the revenue was €534 M with 1.3 M mobile customers and 22 % mobile market share; and with 0.8 M fixed network customers and 195 k broadband homes. In certain regions DNA was the fixed market leader due to its ROC background. The new DNA was divided into mobile and fixed businesses where the latter was seen important as well.

Internet-connection was declared as a basic human and social need. DNA focused on “connecting Finland to the Internet”, not creating services but delivering and marketing them to consumers. This preceded the mobile industry’s global mission “connecting the world to the Internet” and its relevance as “next to food” in the 2010s. Of course, the question
remains: what means “delivering and marketing Internet services” – where is the value added and monetization?

Back to 2007. It had been understood that customer acquisition costs and loyalty matters. Competitive advantages were defined as being light and fast. Focus was on consumers and small and medium-sized enterprises (SMEs) – DNA wanted to be the most wanted telco, fastest growing, operationally most excellent.

The mobile broadband was highlighted. The generic Finnish term for “dongle” (3G USB modem) became “mokkula” launched by DNA. The authorities did not allow DNA to register this as a trademark but the marketing campaign was awarded by The Best of Marketing Prize of the year. Dongles were a transient technology but the episode profiled DNA as “light and fast” in bringing low-cost mobile broadband to people.

Operational excellence was targeted with punctual outsourcings in customer services, finances, installations, maintenance and IT support. DNA wanted to look fresh and different with an edge in marketing and branding and to show that “light and fast” means to leverage the business dynamics. Leadership was highlighted as a service driven by culture and values; the selfie was “fast, bold and straightforward”. The annual report described both the insights and contents of the business: whys (leadership’s beliefs) and whats (events and goals) in real life, not only in financial or technology jargon.

In 2008 DNA grew 20 % with a 9 % mobile growth. Their declared goal was to be the most important consumer player in Finland in a few years’ time. Mobile broadband was highlighted. Limits to growth were to be solved by internationalization (did not happen in the time period of the case study), ideas and innovations. DNA’s three arrows staircase resembles that of Elisa: growth by efficiency and pricing, by marketing and selling, and by creating a new business platform. One DNA was declared with the shift from technology- to customer-focused. Experiments were made by ad-based subscription and music.

DNA said it is competing by price and customer satisfaction which meant back to very basics. It highlighted competence management and service rewards.

DNA’s belief was that 4G will disrupt the copper-based ADSL business and the company moved aggressively to mobile broadband. Another focus was television with interactive cable and fiber and linear antenna connections. DNA was leading television business with a 38 % market share and they believed that the best content migrates to pay-tv.

In 2009, revenue was flat at €652 M with broadband saturation. DNA acquired two television licenses. DNA had been the second largest cable television operator, now it reinstated the goal to be the leading television player. Again, values were “fast, straightforward and bold”. Reorganization into consumer and B2B businesses was implemented and One DNA highlighted.

The growth returned in 2010 when revenue reached €690,5 M. DNA still had one-third of the mobile broadband. The leading cable television operator Welho was acquired. DNA said it wanted to break the existing Digita antenna television monopoly. It also said it needed to accelerate growth and transform from a challenger to the leader. Especially, leadership was the goal in television based on a hybrid model that combines linear cable and antenna network content and on-demand broadband services.

The 2010 annual report discussed the ecosystems of devices, mobile broadband, social media and cloud services, with mutually reinforcing positive feedback and feedforward connections.
In 2011, DNA grew by 5.4%. Forte Netservice was acquired for B2B and mobile switch was to substitute PBXs. Network investments were highlighted. Fixed cable and fiber networks were updated. The insighting and strategy process continued. Identified megatrends were digitalization of services, convergence and aging. The ecosystem was analyzed in detail.

The growth was 5.7% in 2012. DNA market shares were 25% in mobile, 38% in cable, 19% in fixed and 13% in fixed voice. DNA insourced its 500-people customer service which had been outsourced in 2007. New headquarters was built. DNA stated its insight (from the annual report): “Our industry is moving towards a big transformation. Global technology ecosystems such as Google and Microsoft gain foothold and build excellent service platforms for smaller developers.”

The series of events are aggregated and coded as business thrusts, moves, eras and possible turns, i.e., patterns, summarized in Table 5-8 and drawn on the kite strategy map in Figure 5-4. The colors red, green and blue refer to corporate, network/industry and Internet scope, respectively. Proactivity vis-à-vis reactivity decodes the thrust. The direction denotes the orientation of the arrow describing the thrust, move, era or turn.

<table>
<thead>
<tr>
<th>Years</th>
<th>Pattern</th>
<th>Scope</th>
<th>Thrust and direction</th>
</tr>
</thead>
<tbody>
<tr>
<td>2001-</td>
<td>(1) One DNA</td>
<td>Red</td>
<td>Reactive, inside</td>
</tr>
<tr>
<td>2004-2006</td>
<td>(2) Restructuring</td>
<td>Green</td>
<td>Reactive, outside-in</td>
</tr>
<tr>
<td>2003-2006</td>
<td>(3) Broadband tornado due to ADSL and PC Internet</td>
<td>Blue</td>
<td>Reactive, outside-in</td>
</tr>
<tr>
<td>2000s</td>
<td>(4) New competitors and complements due to Internet</td>
<td>Blue</td>
<td>Reactive, outside</td>
</tr>
<tr>
<td>2011</td>
<td>(5) B2B ICT collaboration and acquisition</td>
<td>Green</td>
<td>Proactive, inside-out</td>
</tr>
<tr>
<td>2007-</td>
<td>(6) Mobile broadband tornado due to 3G and iPhone</td>
<td>Blue</td>
<td>Reactive, outside-in</td>
</tr>
<tr>
<td>2007-</td>
<td>(7) Mobile broadband network investments</td>
<td>Red</td>
<td>Reactive, inside</td>
</tr>
<tr>
<td>2010s</td>
<td>(8) Television business declared as another leg</td>
<td>Green</td>
<td>Proactive, inside-out</td>
</tr>
<tr>
<td>2011</td>
<td>(9) Welho acquisition for the television business</td>
<td>Green</td>
<td>Proactive, inside-out</td>
</tr>
<tr>
<td>2000s-2010s</td>
<td>(10) Cultural differentiation</td>
<td>Green</td>
<td>Proactive, top-down</td>
</tr>
</tbody>
</table>

Table 5-8 DNA aggregated event log 2001-2013.

Figure 5-4 DNA trajectory 2001-2013. Letters L, R, C and P denote leadership, resource, customer and process perspectives, respectively.
Table 5-8 and Figure 5-4 are explained as follows:

(1) 2001-2007: Post-hype mobile voice saturation, hypercompetition with low-cost Mobile Virtual Network Operators (MVNO) and the delayed jump to the next S-curve of 3G. In 2007, DNA restarted as a restructured full-service operator with One DNA initiative. This was a corporate issue. Red, reactive.

(2) 2004-2006: The restructuring process was an industry and a market issue.

(3) 2003-2006: At the time of the mobile hypercompetition, the adjacent fixed broadband exploded.

(4) New powerful competitors and complementors were born and raised. This was an externally generated and Internet-driven phenomenon which created the new expanded blue strategy and structure space.

(5) 2011: B2B ICT services were developed and deployed in collaboration with leading IT firms and by the acquisition of Forte.

(6) 2007-: The 3G boom started as mobile Internet explosion driven by smartphones and tablets.

(7) Mobile Internet explosion required network investments.

(8) Television business created as another leg with ...

(9) ... the acquisition of Welho.

(10) Cultural differentiation “fast, straightforward and bold” in the context of operators but not yet as an Internet company.

Comparing Elisa, Sonera and DNA, their strategies looked much the same. There are not so many strategic levers in back to basics connectivity-oriented telco business which has converged doing “same but better” without own R&D for “hard” tacit core competences. Less than strategy, speed together with culture and values made a difference for DNA.

DNA as the third market player grew all the time during the period from 2007 to 2012, 44% in an essentially flat market. Energized by its apparent success, DNA even once said it wants to shift from a challenger to the leader and be the most wanted consumer and SME service company.

DNA leveraged market dynamics, built on culture that was not only internal but radiated into marketing and branding. DNA showed how the local market T-leg is important vis-à-vis the T-hat in the dynamic Finnish lead market. DNA’s television and fixed strategy is predominantly about the third gig in the strategic trident; to be a player by creating negotiation power and get a bridgehead by restructuring the fragmented and as such an unhealthy and changing business. Mobile had substituted POTS as Plain Old Telephony System, Communication Service Providers and DNA prepared to substitute POTS now as Plain Old Television System.

5.2.5 Summary and discussion

The three CSP companies Elisa, Sonera and DNA have different backgrounds and in the 1990s their predecessors had different strategies and structures. It turns out that in the 2000s they followed reactive “same but better” trajectories focusing on one company initiatives with internal enterprise architectures, and on the B2B market by networking. The strategies and structures of the companies in the 2000s were similar. The progressive consumer services they had visioned in the late 1990s were delivered by Internet startups and adjacents, by ecosystems over platforms.
Wrapping up, the local market dynamics can be aggregated into four partly overlapping phases. (1) Post-hype mobile voice saturation 2001-2007 with a delayed jump to the next S-curve, while waiting for 3G, (2) mobile hypercompetition 2004-2006 with (3) overlapping fixed broadband tornado 2003-2006 driven by the PC Internet, and (4) smartphone- and tablet-driven mobile broadband 3G/4G boom after 2007, driven by mobile Internet strategies and structures very different to what was expected a decade earlier.

Despite seemingly similar strategies and structures the company goals were different and they did what they promised:

- Elisa wanted to become the market leader and this was realized with a flat topline.
- Sonera’s focus was cost leadership in (what the TeliaSonera headquarter considered as) the mature non-growing highly competitive market which was Finland’s role in the corporate portfolio. Sonera slashed costs in successive rounds as should be done on a cow market. At the same time the corporation emphasized Swedish (former monopoly) fixed broadband networks by, e.g., envisioning the digital home based on television, and mobile broadband networks in emerging economies.
- DNA wanted to be the growth company relying on its fast and light culture. This goal was fulfilled as well. In addition, DNA diversified into television business through linear and interactive broadband networks, preparing to restructure and build negotiation power in the fragmented pay-tv industry.

Noteworthy is that Finnish operators rejected the “meter and bill” financial model by offering flat time-based and low prices which exploded the use of mobile data because of zero marginal cost for customers. Finland became a lead market this time in mobile data usage and costs.

The three corporate-level kite strategy maps make it possible to draw the common industry-level alignment matrix of Figure 5-5. (1) The bold consumer industry vision in the 1990s was progressive but anchored to existing corporate and industry structures in the value chain as well as to an imagined billable control point. In the 2000s, the vision was realized by complementary adjacents and startups creating ecosystems over global platforms provided by Internet giants. This meant that CSPs retreated from developing innovative consumer services to (2) internal one company infrastructure (2001-) and (3) B2B networking (2005-) strategies. B2B focus was in line with both Willetts’ recommendations (2012) and the mobile world congress discourse.

Figure 5-5 The strategic realignment matrix for the Finnish market with the global outflanking Internet.
The global mobile industry analysis in Chapter 4 depicted a “holon” (Checkland 1981) that CSPs – closely related to the missing Internet insight – followed classic-biased strategy and structure which was also sketched in Figure 4-4. Checkland used this term for an assumption, idea or a distinction that supports further conversation of possibilities even if it is not yet necessarily agreed on. The Finnish market strategic realignment Figure 5-5 resembles the global CSP industry except that the Finnish market had been more progressive in visioning new services at the turn of the millennium.

Table 2-1 presents a checklist for comparing the extremes in classic and new strategies and structures. Using the classic column of this checklist, Table 5-9 summarizes the indications from the Finnish market.

<table>
<thead>
<tr>
<th>Indication for classic-biased strategy and structure</th>
<th>Observations on the Finnish market</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Primacy of economic and financial managerialism</td>
<td>ARPU as the KPI. Opex and capex relevant, focus shifted from cashflow toward shareholder value in the absence of growth. Push to &quot;meter and bill&quot; financial model by TeliaSonera but flat time-based low rates introduced. No other new business models.</td>
</tr>
<tr>
<td>(2) Supremacy of marketing</td>
<td>Bundling, Marketing, selling and service capabilities (CRM) highly relevant and especially in moments of change.</td>
</tr>
<tr>
<td>(3) Dominance of mobile industry value chain and cluster analyses with known competitors</td>
<td>Blind spot towards the coeval Internet. New devices and services from outside the mobile value chain, from adjacents and startups over the Internet and with information-based business models. Mobile Virtual Network Operators (MVNO) phase led to transient hypercompetition.</td>
</tr>
<tr>
<td>(4) Portfolios and processes more important than actual products, enterprise architecture</td>
<td>Portfolio management at corporate and product levels. TeliaSonera considered emerging economies as stars and developed markets as cows needing cost reduction. Strong focus on one company.</td>
</tr>
<tr>
<td>(5) Trust on simple dynamics and being slow</td>
<td>Reactivity to the Internet but the readiness to leverage the moments of change (2004-2005, 2007-2008) a success factor.</td>
</tr>
<tr>
<td>(6) Lack of world-class expertise in new core</td>
<td>Initially, voice domination. Broadband and mobile Internet driven by services developed by others but enabled by low prices. No major innovations, down-sized R&amp;D from the progressive 1990s to me-too offerings in the 2000s.</td>
</tr>
</tbody>
</table>

Table 5-9 Classic-biased strategy and structure using the checklist for the Finnish market.

5.3 Zoom-out to coeval ICT industry

5.3.1 Strategic realignment as management fashion

Same time elsewhere. Communication Service Providers (CSP) did not live in a vacuum but their reactive strategies followed the prevailing management fashion. The global ICT industry mood changed to back to basics and Business To Business (B2B) after the year 2000. Market situation had changed and managers following the fashion did what their peers were doing. For this turn and era, I gave the name Strategic Realignment as the title of my multi-client study 2001-2002 and anticipating the alignment matrix. During these seemingly quiet years many leading ICT firms returned money to their investors because their management did not see opportunities and buying own shares increases earnings per share. But the next revolution was incubating and the sentiment changed again with the new and biggest-ever S-curve (measured by the number of users) breakthrough in 2007. This was the mobile Internet which surprised CSPs and the mobile industry even if it was so close to them that they should have seen it and been prepared to it.
The industry-level strategy maps (adapted from the Strategic Realignment multi-client report, 2001, unpublished customer material) in Figure 5-6 visualize the changing thrusts:

- Process-driven reengineering in the early 1990s where traditional businesses competed with imitation and same but better.
- Vision-driven leadership in the late 1990s due to the Internet and/or mobile with strategic innovators.
- Customer-driven realignment in 2001 with dominant competitors which had strong positions created in the past.
- One company initiatives during the first decade of the 2000s. A large part of the industry was sleeping and turned inwards.
- Vision-driven leadership in the 2010s due to the mobile Internet and towards the emerging Internet of Everything. Most value was created by focusing on the future consumer but this "blue traffic light" was largely left unnoticed by the incumbent ICT industry with their B2B focus.

There is a lot of evidence of a mindset change after the dotcom crash, mobile timeout and so-called Y2K bubble in the year 2000. The change of an era was well covered in literature and media. These years were difficult even to the most successful Internet companies (e.g., Stone 2013, Thiel & Masters 2014). Collins’ (2001) bestseller book resonated with (then misleadingly considered as) the post-Internet era interpreted and sold as conservatism (2001:159): “Technological change does not play the principal role in the decline of once-great companies or the perpetual mediocrity of others ... When technology is used right – when linked to a simple, clear, and coherent concept rooted in deep understanding – technology is an essential driver in accelerating towards momentum.” This conflicts with the conclusion in the earlier book (Collins & Porras 1994:27) that many of the highly successful visionary companies were started without any idea of product or service: "Luck favors the persistent ... never, never, never give up ... be prepared to kill, revise, or evolve an idea, ... never give up the company.” The earlier guidance resembles the startup scene of the 2010s. Collins & Porras (1994) and similar surveys were discussed by Rosenzweig (2007).
Network economy researcher Hal Varian, later a Google economist, crystallized the new era in The New York Times (Sept. 10, 2001): “Forget portals, push, and personalization. Today’s mantra in information technology is ‘services’.”

McKinsey evaluated that the Y2K boom had artificially increased the computer business by 28% (Cho & Neiman 2002; Blumling, Frick & Meehan 2002).

Jim Champy, the co-author of Michael Hammer in Reengineering (1993), wrote about E-Business and technology push (2002:184-185): "I am struck by the emphasis on technology and the lack of attention to how business really gets done. This over-focus on technology and lack of well-developed business thinking was behind many a dot-com failure.” Further, "...`readiness’ was defined as the extent of a country’s information-technology infrastructure ... systems are designed with too much emphasis on to the e for electronics and not enough attention to the p for process”.

Keith Willetts, the founder and chairman of TeleManagement Forum, wrote about the post-2000 period (2012:91, abbreviated here): “After the mobile saturation in 2000, and competition pressed pricing, the focus moved on cutting costs and getting revenue from existing business. This meant that they largely missed the opportunities of new innovative digital services. One by one, these envisioned new services have appeared, but they are delivered by over-the-top providers denying the cashstream from telcos.”

Microsoft had made the B2B conclusion in 1997 when it set the strategic intent to be the leading enterprise software vendor. Kirkpatrick (May 26, 1997, Fortune): "Forget Internet browsers, forget MSNBC, forget multimedia ... Gates's strategy is to extend Microsoft's hegemony from the desktop into the windowless rooms housing the servers, minicomputers, and mainframes that are still central to business data processing. If he succeeds, Microsoft could dominate information technology well into the next decade.”

The New York Times (Lohr, May 4, 2003) wrote that “... the technology itself will still deliver waves of innovation in the future... (but) the underlying components have become so powerful, reliable and inexpensive that you don’t have to worry so much about the underlying engine, and you can move up to higher-level concerns”. This is the reason big firms develop their offering toward businesses: “IBM ... moved more and more toward becoming a provider not only of technology, but also of business expertise ... the focus is no longer on the technology itself ... but on what people and companies can do with it. As a result ... the balance of power is shifting away from technology suppliers and toward their corporate customers ... the use of lower-cost building blocks of computer hardware and software is spreading, making it easier for companies and individuals to share data and work together using industry standards rather than remain dependent on one or two main suppliers.”

Kirkpatrick (April 28, 2003, Fortune) summarized that “ ... a new kind of growth in Silicon Valley; it benefits customers more than investors ... the underlying tech boom that began the bubble actually has never stopped. It just stopped paying off ... If anything, the rate of innovation in technology has increased in the past couple of years. But that doesn’t necessarily make it a good business. The beneficiaries are the end users.”

Website www.alwayson-network.com (Donato 2003) summarized this by writing that “Most Tech Sectors are Joining the Service Evolution ... in this service orientation, providers charge for the benefits they deliver – not just the delivery of a physical asset. This aligns the interests of providers and customers in a way that rewards both innovation and resource productivity.”
In Business Week (Aug. 25, 2003) HP’s then-CEO Carla Fiorina said that “… in the 1990s, innovation was really focused around killer apps, hot boxes. Technology was seen as stand-alone, silver bullet answer to a lot of problems … (but now) most important is … weave systems and networks together … require system approaches … scope and scale … that the industry will consolidate”.

Before 2001, the belief was that there would be highly focused, dominant market leaders, like tigers or gorillas, and that these new leaders would grow from gazelle startups, being able to replace much of the established economic order (Moschella 2003:34). Moschella also wrote that the overreliance on this mindset was one of the main causes of the Internet bubble (2003:28-29, 40). After the startup boom the venture capital industry refocused on less risky existing businesses and scaling of innovations – a self-justifying act, and innovation reduced to a planned routine as predicted by Schumpeter (1942:132).

5.3.2 New stealth thrust and era

In the seemingly quiet but deceptive years the next revolution incubated and the startup fever returned. The mobile Internet brought back the small, simple and sometimes trivial “things” with entrepreneurial opportunities in the 2010s but – despite a ten-fold number of users – this financing boom still did not match the scale of the previous one (Meeker 2014:21-23).

5.3.3 Summary and discussion

After the year 2000, the global ICT industry adopted a reactive, passive and B2B-oriented strategy. Thus, the observations about Finnish Communication Service Providers (CSP) are by no means unique, CSPs followed the prevailing management fashion. The retracting from consumer services to B2B meant forgetting new strategies and structures, leaving this expanding blue value space for new players.

Figure 5-7 sketches the global ICT industry alignment matrix showing their withdrawal from the early Internet consumer service vision (1990s) to B2B enterprise solutions (2000s) and to networked cloud services and X as a Service (XaaS, 2010s).

Figure 5-7 The strategic realignment in the global ICT industry.
5.4 Nokia from intent to exit

Nokia’s extraordinary rise in the 1990s to the undisputed market and thought leadership was based on the strong pre-Internet intent with the well-executed classic strategy and structure and the early consumerization of products with hardware excellence. In the mobile industry flipflop of 2007, voice degraded to context and the Internet became the new core, devaluing Nokia’s managerial capabilities of customer segmentation, portfolio, complex logistic process and retail shelfspace management, even from "core competences” to "core rigidities” (Leonard 1992).

Here, Nokia is discussed neither as an isolated company nor in the context of the mobile industry alone, instead, its analysis is based the fractal and dynamic context of the broader digitalization. However, the discussion is selective and may suffer from a confirmation bias because – notwithstanding Nokia’s success at the turn of the millennium – I address issues relevant for highlighting the industry-wide missing Internet insight and hypothesized classic-biased and incoherent strategy and structure.

Nokia’s corporate history is dotted with jumps to new long waves and S-curves and exits from old businesses. The series of events described here is not unusual, but the scale of the triage is. Founded in 1865, Nokia surfed and jumped from paper to rubber to electronics, and in the 1980s, to the S-curves of computer and consumer electronics manufacturing and sales, data processing services and telecommunications. Nokia is a different type of company compared to younger technology firms. It has a longer history than, e.g., IBM (est. 1911), HP (1939), Samsung (1938), Apple (1976), or Huawei (1988), even longer than Ericsson (1876). In the boom years of the 1990s Nokia hired managers from industrial companies. Its success, stall and recovery between 1992 and 2015 was not created by founders, nor by digital natives, but by salaried managers.

In the late 1980s Nokia was a broad portfolio of businesses in a financially difficult situation. It had invested in electronics for decades. The hockeystick success came after focusing sharply on global mobile consumer communications in 1992, i.e., three years before the breakthrough of the commercial Internet. Nokia was not an Internet company but despite this it became an unforeseen and unlikely success from an Arctic country on the edge of the inhabited world. This was an example for many who thought that if Nokia did that, yes we can do it.

5.4.1 The events

The event log in Table 5-10 begins from 1992, from the digitization of and the focus to mobile telecommunications. Before that, Mobira (a joint venture of Nokia and Salora, established in 1979) had been a major regional player in the Nordic analog mobile (NMT) lead markets since its first NMT phone was launched in 1982. This means that the formative decisions were from the 1970s, two decades before the commercial breakthrough of the Internet.
A formative event for Nokia’s operational excellence was the logistic crisis (1995). It was caused by the tornado of the mobile phone business and solved fast. CEO Ollila later said that Nokia had a 20 percent cost advantage for its scale.\(^{73}\) In the early 2000s, Nokia implemented what it called the cluster manufacturing strategy, and in 2006, Nokia had the best supply chain in the world, according to AMR Research (Snell 2007): "As a pioneer in value chain

\(^{73}\) The Boston Consulting Group (BCG) experience curve – compared to maturity in Chapter 2.2.2 – states the optimal market share at 40 \% which was Nokia’s goal. BCG models predict that a doubled (cumulative) production creates a cost advantage of circa 20 \%. But in software, there is no production and the marginal cost is near zero, and networking and feedback factors amplify scale advantages.
strategy, Nokia has led in supplier development, sales and operations planning and collaborative product development." Clustering meant getting rid of smallish Finnish subcontractors for Asian scale. Nokia had an industry-level operational dominance. Nokia’s effort to protect its value chain was later chronicled by Hyöty (2011:49, 55, 69). Nokia tried to convince that what had happened in computers – the horizontal business model – wouldn’t happen in mobile: Nokia fought against new strategy and structure, extending its successful manufacturing management to software which was seen more as a component than a platform.

The clamshell and thin form factor crises (2003-2005) were about new dominant designs in hardware. Competitors launched new kinds of boxes and Nokia responded.

Logistic and design crises were intra-S-curve crises, operational issues. Nokia cleared these challenges with its management based on the long industrial history. But the design events were early warnings about getting slow and losing touch with lead markets.

In the early 2000s, when telcos saw Internet as their enemy, this was partly based on Wi-Fi as the competitive free commons-based connectivity. In addition, telcos wanted to develop their own walled garden services and were suspicious towards Nokia’s efforts in Club Nokia which they considered cannibalistic. Unlike the competitor BlackBerry, Nokia adapted to its customers’ expectations after their boycott in 2004 (Lindén 2015, McNish & Silcoff 2015), refocusing Nokia back to hardware.

Nokia had a touchscreen (N7710 in 2004) and a tablet (N770 in 2005) before Apple but did not have the Internet insight and the needed software capabilities back then. Touchscreen and tablet were experimental alternatives, small segments in a big portfolio, toys outside the mainstream. When the tablet (developed since late 1990s) was finally launched, it was not first taken seriously and Nokia even dropped the phone functionality to avoid competition with its mainstream.

The mobile industry was a big advertiser. In 2010 Nokia was number one and Vodafone number two brand in Europe before Louis Vuitton, Mercedes and BMW. Nokia had launched a major customer segmentation effort presented during successive Capital Market Days (Nov. 28, 2006; Dec. 4, 2007; Dec. 4, 2008; also discussed by Hyöty 2011:75, 121-147, 159-164). This global device portfolio was based on box differentiation with a phone for every purse and purpose, to borrow here Sloan’s GM slogan, but due to emerging markets Nokia’s portfolio biased toward the low-end and mid-range. There was no common design factor across the lines of phones but worse than that was the fragmentation of the software platform.

Around year 2000 Nokia together with the mobile industry launched value-added data services based on WAP (Wireless Application Protocol), soon renamed by consumers as Wait And Pay. WAP was a disaster because the PC-based Internet had already made a breakthrough, consumer expectations were based on the adjacent Internet, but WAP was an intent to reverse the flow of the history.

Bill Gates had compared Nokia and Microsoft in the 1990s by saying that Nokia is a hardware company whereas Microsoft is a software company. Later Steve Jobs said he

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74 Club Nokia was launched in 1999 as a customer loyalty program with ringtones and pictures, but evolved into a value-added but non-core service. It was canned in 2004 due to an opposition from teleoperators who had launched their own value-added services.

75 AdAge (2013). In the U.S., AT&T was the biggest and Verizon the second biggest advertiser, T-mobile was number eight.
believes Apple will succeed in mobile phones because it is a software company (which however makes its hardware) and the competitors are hardware companies. In retrospect, this was summarized by CCS analyst Ben Wood (Lee 2013): "They missed the importance of software ... They went through this incredible decade of innovation in hardware, but what Apple saw was that all you needed was a rectangle with a screen, and the rest was all about the software." The WAP case had revealed the weakness of the software capabilities of the mobile industry. As mobile world congresses show, this lesson was cushioned and faded by the fast growth of the basic phone business in emerging markets which blinded the industry from seeing the coming upmarket disruption. In high-end products Nokia adapted the Japanese multi-media rhetoric and produced camera phones renamed as multi-media computers in 2006.

Nokia understood the rise of emerging economies. More than a decade later, Apple and Google were still U.S.-centric with so-called high value jobs centralized in Californian campuses. Nokia was a distributed company even inside Finland and tensions between development centers were an issue. A common theme in the new lean literature is the colocation of development teams.

The software problems resurfaced when Nokia launched the Ovi mobile portal in 2007 as a continuation to Club Nokia. Ovi (door in English) was launched "ugly early" and it took long to make it on hinges. Unlike Apple’s global new deal, Ovi was to be segmented by countries and operators.

The big problem was the fragmented Symbian operating system with its value-added services style user interface and cumbersome menu structure. It reflected the technical properties over customer-perceived aspects mindset of the 1990s. Symbian sported in feature-by-feature comparisons but user and developer experiences could not match iPhone and its fast-follower Android which were based on and made for the Internet as the new core. Internet-optimized lightning-fast touchscreen platforms attracted consumers and developers and portfolio management became based less on internally planned hardware than on external apps. Nokia’s competing product N9 and its new operating system – initially Maemo, then MeeGo in collaboration with Intel – was discontinued in 2011 by the new leadership as too late too little. The developers then founded a new company Jolla to continue the work under the name Sailfish.

In 2004, to simplify and speed up its businesses, Nokia launched a matrix organization with Multi-Media Phones, Enterprise Solutions, Mobile Phones and Net(work) businesses. The matrix had three common so-called horizontals – business infrastructure, technology platform, and Customer and Market Operations. This decision was conceived catastrophic by Doz & Wilson (2018:106-107), the single most harmful ever made by Nokia, directly because it led to fragmentation, slowness, and internal competition, and indirectly because it led to the exit of key executives. Nokia conceived the matrix in its classic form which required time-consuming internal negotiations and reporting but the idea of a horizontal layer is not faraway from the successful platform-based business models which, e.g., Amazon was implementing at the same time. At Nokia, the technology platform was internal or (in the

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76 The lack of Internet and software CVs in Nokia board and management was analyzed by Hyöty (2011:171-173) and Nykänen & Salmi (2014:23-26). Former Nokia CEO and Chairman Ollila pointed to missing world-class software skills after the Microsoft deal. A similar issue at Sony was discussed by Chang (2008) with a conclusion that young software engineers were at the bottom of the pyramid dominated by older hardware engineers. In other words, software was context not core, the expertise was undervalued and the work was fragmented, lacking a direction, respect and commitment. Nokia’s software management problems were discussed by Siilasmaa (2018).
case of Symbian) for the industry, and the business infrastructure was the traditional enterprise architecture. At Amazon, the single unified platform had open well-documented interfaces for external developers, so-called Service-Oriented Architecture for microservices and apps, later conceptualized as boundary resources (Ghazawneh & Henfridsson 2013, Eaton et al. 2015). Open boundaries led internally to “two-pizza teams”, a flat fractal structure with independent small high-performance units and fast delivery, and externally, they attracted third party developers, services and merchants to create an ecosystem. Carving out the platform from and for businesses was not a wrong idea, i.e., the coherent alignment matrix was a must, but at Nokia, this was executed as an internal matrix organization. Doz & Wilson (2018) concluded that Nokia’s strategy followed its unmanaged structure but Nokia was also following the conviction of ecosystems as too simplistic.

Due to hardware segmentation, Symbian came in 57 varieties (Doz & Wilson 2018), to borrow the famous Heinz ketchup slogan. As observed by Doz & Wilson (2018), this fragmentation meant slowness, low quality and high costs. This was the first misfit between Nokia’s strategy and structure before the new Internet competition from Apple (2007) and Google (2008). Internet was discussed during Nokia Capital Market Days (Dec. 4, 2008, nearly two years after the launch of iPhone) but in the corporate context: “Internet services Nokia had chosen to focus on are maps, media, music, games and messaging.” Still no mentioning about ecosystems. Instead, Nokia told that its objective is to capture value from music and media player, still and video camera, and portable GPS device industries. Internet was conceived as services, not as a platform for ecosystems.

Since 1998, Nokia had followed a segmentation strategy which urges to search growth pockets. This McKinsey growth theory – documented by Viguerie et al. (2008; Chapter 3.2.2) – builds on the company-internal scale platform. This theory did not contain ecosystems as accelerated and externalized innovation and segmentation with minimal barriers of entry. Nokia’s segmentation led to extensive box variations which fragmented Symbian due to alignment traps created by hardware tailored for specific customer needs and segments.

Nokia played a dual strategy with Symbian (Gawer 2009). The platform was governed by a Nokia-led but seemingly neutral foundation. Nokia built its products on Symbian which was used by competitors as well. This arrangement succeeded in winning Motorola and blocking Microsoft, but no more in preventing adjacent Apple and startup Google from outflanking the mobile industry from two sides: Apple from devices and Google from cloud and software. Symbian consortium industry members escaped to Android which left Nokia alone and the foundation was ramped down in 2010. iOS and Android attracted a huge number of third party developers. The defense line backed by operators had succeeded against Microsoft’s lukewarm efforts but did not hold against strategic innovators, and the market pressure from Apple and Google turned Nokia and Microsoft to friends. Like Symbian, the new Nokia-Microsoft alliance was a defensive move reportedly (e.g., at MWCs) supported by operators needing a “third horse in the race”. The reality was that operators were drifting without insight and strategy and were not committed. Consumers, developers and Internet giants were the ruling actors, not the operators.

The new structure allowed consumers to mass-customize their phones by ecosystem-created apps – try, accept or reject – doing segmentation and portfolio management as a self-service. To attract developers, the platform was the same without variations whereas a hardware-centric view with cost-optimized BoM (Bill of Materials) led to multiple variations
where software was conceived as a component not the platform. In the new structure, app developers are not subcontractors, software development is not about vendor relationship management as in clustered manufacturing, it is about marketing, selling and supporting the platform for complementary innovators using their own money and time. This mindset and cultural shift from own services to supporting and accelerating developers was observed at MWCs in the 2010s. For Nokia, this led to the second misfit, or better said, incoherence between strategy and structure.

The change to ecosystems over platforms was market-broadening and competence-destroying (Utterback 1994). Less products, lower product development effort and cost, more spins, faster clockspeed, wider basin, stronger coherence. The phone as a small-screen hand-held voice device devalued from core to context and the mobile Internet repositioned from context to core with Internet appliances and bigger screens. The jump to the mobile Internet happened at the time (2007) that was predictable from previous cycles. A similar change had happened twelve years earlier in fixed networks. This meant an escalating crisis for Nokia, in the blue outer zone of the expanding alignment matrix, different from intra-S-curve crises it had solved so easily. Given Nokia’s industrial history of jumping curves, drifting into this situation in a fast-growing market was a surprise especially in the light of the early warnings. The response of Nokia was “execution, execution, execution” but it was riding on a dead horse and kissing a frog. Declining market share and financial stall escalated to a life-threatening situation as market share and finances are lag variables to competences, capabilities and customer experiences.

From an internal and leadership perspective, the drifting has been described by Siilasmaa (2018) and Vuori & Huy (2016). For example, Siilasmaa wrote that in 2010, he was the first Nokia board member ever to visit MWC.

In 2011, the newly appointed CEO Stephen Elop announced a partnership with Microsoft which was drifting into a danger zone by losing its twenty-year operating system leadership. iOS and Android dominated post-PC devices which outsold PCs in 2011. When Elop was recruited, commentators pointed to Microsoft. Wouldn’t it be a surprise if anything else than Microsoft would be chosen as Nokia’s operating system partner? Later media focused on why Nokia decided on Microsoft only. It happens that successful leaders and firms copy themselves (Fonseca 2002:118), innovation reduces to a routine (Schumpeter 1942:132), the behavior institutionalizes to a modus operandi learned during earlier formative events. With one big bet, Nokia was trying replay its history of 1992. Ollila’s and Elop’s careers were based on bold strategic intents, in Elop’s case, at Macromedia, then at Microsoft with the intent ”beat Google” (Nykänen & Salminen 2014). Elop said that Nokia’s main competitor is Google, not Apple, and it is a good strategy to ally with enemy’s enemy. This was classic strategy rhetoric focused on competition. But why to tie hands and lock in, a strategy should be dynamic and lean with real options.

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77 Shareholders’ General Meeting 2010. Company internal communications.

78 Some analysts have written that beating competition was the strategic style of Gates’s and Ballmer’s Microsoft whereas Nadella’s new Microsoft focuses more on customers and collaboration.

79 Elop was pointing at Google as Nokia’s main competitor two months before Nokia’s board decided to go with Microsoft. This episode is not mentioned in the sources I have seen but I heard this when listening Elop’s live Christmas speech at Nokia House, Espoo, Dec. 17, 2010. With Microsoft’s strategic intent to “beat Google” Elop declared a continuation war against the Internet. Nokia’s alternative would have been ”you can’t beat them, join them”.

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The strategy is not a stack (in this case, Microsoft) but a map, and stack and map must match. It soon turned out that the Microsoft stack and the intent of higher-end devices for the U.S. and European markets was incoherent with Ollila’s original (1992) pre-Internet intent and Nokia’s prevailing global consumer focused product-market map. The new stack did not scale down to mass-markets fast enough. Simultaneously with the Microsoft decision, Nokia announced The Next Billion (Internet users) initiative to compete with refreshed legacy feature phones against Androids.

Nokia was playing a catchup game with as good phones as competitors by stressing camera, location-based services and hardware durability. But these features were neither essentially better nor issues for consumer value. There was no place for the third horse which was too similar but still different. Nokia now as the challenger should have been “ten times better than the existing leader” to make a breakthrough.80

After having lost much of its market position Nokia introduced Android phones in 2014. Analysts thought this was to press Microsoft board to accept the negotiated deal to buy Nokia’s phone business – now Nokia had the Android alternative and without Nokia Microsoft would be out of the mobile business.

During the unfolding of these events Nokia lost the business it had dominated since Nokia Communicator in 1996. Sudden value migrations are not rare in digitalization. An early example was Xerox’s failure to move from office automation to office systems with PCs and software. Another case was Digital, one-time iconic leader whose genes migrated to Google (Levy 2011). Few have recovered, IBM and Apple being exceptions.

The stories of television and broadband are relevant to the case in point (RTT 2008). Nokia’s history in analog television included the acquisitions of Swedish Luxor, Finnish Salora, French Oceanic and German Standard Elektrik Lorenz. The analog high-definition (HD) television turned out to be mission impossible during the Barcelona Olympics (1992). Nokia refocused on digital and later (1996-1997) on digital interactive television then called DTVi. This development started after the Internet had already made its commercial breakthrough. The history of the television business has been to bring global maps (content) to local stacks (platforms). Internet works the other way round. A television executive who had been deeply involved in this told in my interview (2013): “Back then, we did not believe in the Internet ... we did not know much about it.” Nokia sold its television manufacturing to Taiwanese Semi-Tech (1996), retained the set-top R&D in the anticipation of the digital interactive television, but discontinued the set-top box business in 2005.

The original rationale for the 50/50 Nokia Siemens Networks (NSN) merger (2007) was to create a full-line top-three vendor with both mobile and fixed networks (Venäläinen 2013, Ovum 2011, Byrne 2012). In November 2011, NSN announced a sharpened strategy with the focus on mobile Internet, services and costs. It started restructuring by divesting fixed networks. With a slogan “Innovating for a world in motion” the company managed a turnaround in finances in 2013. In summer 2013 Nokia bought Siemens out of the joint venture, anticipating the sale of Nokia’s devices and services business to Microsoft. NSN was now Nokia

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80 Thiel & Masters (2014), although this resembles the loyalty hysteresis curve where the rule of thumb is that it costs five times as much to acquire a new customer than to keep the old one. When it comes to platform markets, due to network effects and switching costs, “… entrants generally must offer revolutionary functionality to win substantial market share” (Eisenmann et al. 2011). Risto Siilasmaa, Nokia Chairman, said at Shareholders’ General Meeting 2013 that Nokia now has good phones, better than before, so why shouldn’t they sell when earlier Nokia was able to sell phones which many people said were not so good (not a verbatim quote, from my notes).
Solutions and Networks. In May 2014, then-new CEO Rajeev Suri talked publicly about Internet of Things as the new direction but without any concrete strategy yet. In 2015, Nokia acquired Alcatel-Lucent and returned to a full-line vendor with mobile and fixed networks. The reason was clear in the light of GSMA market data presented at MWC 2015 and 2016 Barcelona: no expected growth in mobile network investments before 2020, instead, in-market consolidations and convergence of mobile and fixed. In addition, mobile was no more a separate business or industry, it was reconceived as a user interface. At MWC 2015 Shanghai in July 16 referred in Chapter 4.4.4, Suri said that connectivity is no moneymaker in Internet of Things and that high value-added applications and services are needed, e.g., in health and traffic – “... we’re working on connectivity platforms for IoT, but ultimately the answer is not there. The spend will be all in the services and applications...”. In many other presentations, mobile industry executives expected that the coming of 5G around or after 2020 would create new opportunities for Internet of Things, especially in B2B. The situation looked similar to the early 2000s when the industry waited for 3G but did not realize that the long-awaited services were first implemented through Wi-Fi, on the Internet and for consumers.

5.4.2 Summary and discussion

The series of events are aggregated and coded of business thrusts, moves, eras and possible turns, i.e., patterns, summarized in Table 5-11 and drawn on the kite strategy map in Figure 5-8. The colors red, green and blue refer to corporate, network/industry and Internet scope, respectively. The direction denotes the orientation of the arrow describing the thrust, move, era and possible turn.

<table>
<thead>
<tr>
<th>Years</th>
<th>Pattern</th>
<th>Scope</th>
<th>Thrust and direction</th>
</tr>
</thead>
<tbody>
<tr>
<td>1992</td>
<td>(1) Pre-Internet era strategic intent</td>
<td>Green</td>
<td>Proactive, top-down</td>
</tr>
<tr>
<td>1992-</td>
<td>(2) Product-market strategy</td>
<td>Green</td>
<td>Proactive, outside-in</td>
</tr>
<tr>
<td>1995</td>
<td>(3) Logistic crisis</td>
<td>Red</td>
<td>Reactive, inside</td>
</tr>
<tr>
<td>2000s</td>
<td>(4) Operational excellence</td>
<td>Red</td>
<td>Reactive, inside</td>
</tr>
<tr>
<td>2003-2005</td>
<td>(5) Competitive new designs</td>
<td>Red</td>
<td>Reactive, outside-in</td>
</tr>
<tr>
<td>2004-2005</td>
<td>(5) Touchscreen and tablet go-to-market strategy</td>
<td>Green</td>
<td>Proactive, inside-out</td>
</tr>
<tr>
<td>2006</td>
<td>(5) Hypersegmentation</td>
<td>Red</td>
<td>Proactive, inside-out</td>
</tr>
<tr>
<td>1990s-2005</td>
<td>(6) Television</td>
<td>Red</td>
<td>Proactive, inside-out</td>
</tr>
<tr>
<td>1999-2004</td>
<td>(7) Club Nokia</td>
<td>Red</td>
<td>Proactive, inside-out</td>
</tr>
<tr>
<td>2000</td>
<td>(8) WAP platform</td>
<td>Green</td>
<td>Proactive, inside-out</td>
</tr>
<tr>
<td>2001-2011</td>
<td>(9) Symbian, later Maemo/MeeGo</td>
<td>Green</td>
<td>Proactive, inside-out</td>
</tr>
<tr>
<td>2007-2011</td>
<td>(10) Ovi platform</td>
<td>Green</td>
<td>Proactive, inside-out</td>
</tr>
<tr>
<td>2007-</td>
<td>(11) New outflanking competition</td>
<td>Blue</td>
<td>Proactive, outside</td>
</tr>
</tbody>
</table>

*Table 5-11: Nokia aggregated event log for the pre-Internet and early mobile Internet eras.*
For better readability, the aggregated business moves in Figure 5-8 are divided into two parts. On the left side is the pre-Internet success era of (1) the strategic intent “focused, global, telecom-oriented and value-added” with (2) a fit product-market strategy and (3) operational excellence. Formative reactive events were (4) the logistics crisis (1995) and (5) industry competitors with clamshell and thin designs (2003-2005). In this pre-Internet context, Nokia developed a fit strategy map of hardware-based product-market portfolio and operational excellence with enterprise architecture. After year 2000, hardware product proliferation started to fragment the software platform and slow down the company, evolving into a misfit between strategy and structure.

In the preparation for the mobile Internet era, broken arrows on the right side illustrate failed moves. I use the number (5) also for touchscreen and tablet (2004-2005) because they – as multiple hardware designs earlier – represented the hypersegmentation (2006) where the touchscreen and the tablet were experimental niches subdued to the product portfolio management. Before this, (6) television (1990s-2005) and (7) Club Nokia (1999-2004) were internal new business initiatives whereas (8) WAP (2000), (9) Symbian and later Maemo/MeeGo (2001-2011) and (10) Ovi (2007-2011) aimed at industry platforms. However, the mobile industry became (11) outflanked by new competition from the expanding blue Internet zone.

The business moves television, WAP, Symbian and Ovi were based on existing industry value chains, incoherent with the structure and dynamics of the Internet economy and the nascent newest cycle of digital transformation. Touchscreen was conceived as a hardware and user-interface issue for value-added services rather than the key software enabler for the mass-adoption of the mobile Internet.

When Apple and Google triggered the mobile Internet tornado (2007-2008), i.e., “crossing the chasm” (Moore 1991), Nokia stuck to its hardware-based hypersegmentation, unable to commercialize its new software platform in time, drifting to an incoherence between strategy and structure. The late effort to fix this with the Microsoft stack (2011) was incoherent with the prevailing broad global consumer-oriented strategy map and the developer community, resulting in a self-declared two-front (high-end and low-end, i.e., Microsoft and The Next...
Billion initiative) war against Google as the icon of the Internet and finally to an exit from the device and service business (2013/2014). Here (Nokia’s location-based service business) as the remnant of the device and service business was sold to a consortium of German auto-makers (2015). This series of events was lucky for Nokia’s shareholders because Microsoft had to downside and write off the device business (2015). In the end game Nokia became a B2B company proving network solutions to CSPs.

In its utter simplicity the kite strategy map in Figure 5-8 resembles a Gantt chart. Without a clear vision and a commitment such as that during the pre-Internet era, but now regarding the Internet, the industry-level operational hardware dominance had little relevance.

The alignment matrices in Figure 5-9 are constructed from the strategy maps in Figure 5-8 by rising the level of abstraction but using the same numbering. They show the expanding strategy and structure. On the the left, before 2007, the Internet was the known unknown, in other words, known by name but not by the framework, thus the white territory. Through moves (1-5), Nokia became the global market leader in 1998. (7) Club Nokia loyalty program (1999-2004) was Nokia’s corporate value-added offering for its consumers but due to a conflict with operators it was discontinued. In the beginning of the 2000s, the mobile industry tried to offer own regional planned value-added services based on their imagined billable control point in the value chain. This was supposed to be the industry (8) WAP platform (2000). (9) Symbian was followed by Maemo and MeeGo initiatives (2001-2011) and (10) Ovi (2007-2011) aimed at industry-level software platforms. At the same time, (5) the hardware portfolio of multi-media, enterprise and mobile phones kept on its fragmentation, leading to a misfit between hardware variety and software unity. (11) Ecosystems as coherent interplays of new strategies and structures were an unknown framework territory for the whole mobile industry. Internet was understated as a basket of services, not yet as the competing and ultimately winning platform. The new networked B2B Nokia is also drawn in the matrix.

![Figure 5-9 The alignment matrices at Nokia (device business): drifting in the pre-Internet era and outflanked by the mobile Internet.](image-url)

Nokia’s enterprise and extended enterprise architecture was awarded as world-leading in hardware manufacturing. As an inheritance of the formative logistic crisis of 1995, it enabled rich hardware scale and variety. On the other hand, the Symbian software platform had fragmented due to this hardware variety already before the mobile Internet era. The mobile
Internet made data the new core, no more value-added, and Symbian was perceived cumbersome by users and developers because of high barriers of entry. Neither was the substitute Microsoft stack able to create a strategic attractor with necessary spins, clockspeed, basin and coherence.

From the shadow of the market leader Nokia, iPhone (iOS 2007) with App Store (2008) created a new structure, fast-followed by Android (2008). Apple had been known as a tightly managed and hierarchical one company, now the needed looseness was outsourced to ecosystems and markets. The new structure allowed to focus on consumer experiences, behaviors, intents and services, attracting developers with low barriers of entry and a single global financial model. Instead of planned and managed corporate services, or industry collaboration, alliances, competition and schisms, innovation was centrifugalized to the outer blue Internet space with a swarm of millions of parallel shortcut paths from insight into execution and back.

Table 5-12 features the alignment matrix with the strategic slideruler, trident and attractor. Nokia as a hardware manufacturer added services over its broad portfolio of boxes, aimed at building industry platforms in collaboration, but the industry was outflanked by adjacents and startups which leveraged Internet spins, clockspeed, basin and coherence.

<table>
<thead>
<tr>
<th>Tool/indication for the alignment matrix</th>
<th>Observations on Nokia</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Strategic slideruler from classic to new with routes</td>
<td>Value-added data services for hardware-based voice-focused phone portfolio outflanked. It was not possible to create a new strategy over the classic industry value-chain structure.</td>
</tr>
<tr>
<td>(2) Strategic trident with multiple strategies and structures</td>
<td>Focus on existing connectivity (&quot;C&quot; in ICT) for Connecting People. Failed attempts to create new businesses. No major restructurings (M&amp;As) in the device business.</td>
</tr>
<tr>
<td>(3) Strategic attractor as the external source of dynamics</td>
<td>Confessed slowness and lack of dynamics. Not able to create or leverage external spins, higher clockspeed, global basin and strong coherence.</td>
</tr>
</tbody>
</table>

**Table 5-12** Classic-biased strategy and structure using the strategic slideruler, trident and attractor.

Indications of classic-biased strategy and structure at Nokia as the market and thought leader are listed in Table 5-13.
<table>
<thead>
<tr>
<th>Indication for classic-biased strategy and structure</th>
<th>Observations on Nokia</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Primacy of economic and financial managerialism</td>
<td>Board of directors and executives with financial or general business backgrounds. A massive even if not unusual €18.6 B share buyback scheme. Fact-based management with ARPU simulations instead of discovering new business models.</td>
</tr>
<tr>
<td>(2) Supremacy of marketing</td>
<td>The brand value encouraged Nokia to think it can sell 150 M Symbians after it was declared dead. Pockets of growth theory with hardware segmentation led to fragmentation. Leveraging brand in emerging markets to the detriment of lead markets led to low-end and mid-range biases with large unit numbers.</td>
</tr>
<tr>
<td>(4) Portfolios and processes more important than actual products, enterprise architecture</td>
<td>A broad hardware portfolio with low-end and mid-range biases on the fragmented and aging software platform. Business infrastructure and cluster strategy with hardware demand-supply network prowess led to an incoherence. Microsoft stack incompatible with the 1992 intent and prevailing product-market map which led to a two-front (low-end, high-end) war against Google and the Internet.</td>
</tr>
<tr>
<td>(5) Trust on simple dynamics and being slow</td>
<td>After four years, still no response to iPhone. Vendor management and contracting favored to creating and marketing a future-proof platform with a low barrier of entry for developers: few spins, slow clockspeed, small basin, little coherence.</td>
</tr>
<tr>
<td>(6) Lack of world-class expertise in new core</td>
<td>Hardware cluster management principles extended to software. WAP, early touchscreen and tablet, Symbian, the delayed new Maemo/MeeGo operating system, and Ovi indications of software weakness. Datafication as the new financial model conceived as otherness.</td>
</tr>
</tbody>
</table>

Table 5-13 Classic-biased strategy and structure using the checklist for Nokia.

5.5 Summary

Figure 5-10 triangulates the fractal case study of Chapter 5 with the transformation cycle, the alignment matrix and the kite strategy map.

The transformation cycle visualizes how the scale, scope and speed of consumer innovations in the blue expanding space outflanked corporate and industry initiatives. This centrifugation led to an enormous rise of entrepreneurial activity and value migration, due to startups and adjacents, making 3G and 4G networks alive, as commended at MWC 2013 by Manoj Kohli, CEO of Indian Bharti Airtel.

In the alignment matrix, the same phenomenon is seen in the blue expanding space with the dominance of new structures and strategies. After the dotcom crash and mobile timeout in 2000, Communication Service Provider (CSP) and ICT (Information and Communication Technologies) industries retracted to enterprise architectures and networked collaborative services, i.e., to one company initiatives and to B2B. Internet platforms also added B2B services to their portfolio.

The innovation trajectories in the kite strategy map centrifugalized to the blue expanding space.

The patterns in Figure 5-10 epitomize the surrender of corporate and industry strategies and structures to ecosystems, predicted by multiple writers in the mid-1990s. But all three frameworks consist of portfolios. There are still internal activities and developments, planned and managed networking (thin dotted lines), and ecosystems (thick solid lines), but in the mobile case most of the value migrated to the outer blue space.
As to the research design, the global industry analysis summarized in Table 4-3 left gaps to the transformation cycle which are now addressed and filled in Table 5-14.

<table>
<thead>
<tr>
<th>Tool/indication for the transformation cycle</th>
<th>Observations summarized</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Generations of insighting</td>
<td>Up to 2007, European mobile industry looked at the Japanese multi-media as the lead market instead of the U.S. and the Internet. The emerging markets blinded the industry. The power-shift and value migration to the U.S. Internet was highlighted in 2011.</td>
</tr>
<tr>
<td>(2) Puzzle of knowns and unknowns</td>
<td>Internet as a known unknown up to 2007 with its frameworks as an uncharted white space. Neglect of adjacencies and startups and their business models seen as otherness. Disaggregated lead markets understated to the detriment of aggregated emerging markets.</td>
</tr>
<tr>
<td>(3) Superstacks with megatrend collisions</td>
<td>Visions based on connectivity except, e.g., Docomo’s Shaping a Smart Life. In the 2010s, intent to cover all five levels of PESTE and Maslow superstacks with B2B approach to support corporate innovation.</td>
</tr>
<tr>
<td>(4) Map of business dynamics</td>
<td>Many dynamic phenomena observed as listed in Table 4-5. The lack of acceleration and speed confessed by the industry. Late timing of the commercial breakthrough of the Internet.</td>
</tr>
<tr>
<td>(5) Kite strategy map</td>
<td>Maps drawn for the Finnish market, the global ICT industry and Nokia.</td>
</tr>
<tr>
<td>(6) Stack</td>
<td>From internal and extended enterprise architectures to external new architectures with low barriers of entry for complementors.</td>
</tr>
<tr>
<td>(7) Fit/coherence between expanding map and stack</td>
<td>The initially fit corporate and industry drifted to a misfit while offering baskets of internally-developed value-added services over fragmented corporate and industry structures. After 2007, a fast emerging incoherence due to the outflanking mobile Internet with ecosystems.</td>
</tr>
<tr>
<td>(8) Globalization</td>
<td>Global Internet dwarfed local service delivery platforms in the fragmented industry.</td>
</tr>
<tr>
<td>(9) Talent Supply Chain Management</td>
<td>Mobile industry used corporate, industry and networked processes to create services for their legacy business model. This meant TSCM resourcing.</td>
</tr>
<tr>
<td>(10) Lean discovery</td>
<td>Information-based (free) financial models seen as otherness, as threats for the industry and consumers, instead of opportunities to be discovered in the outer Internet space.</td>
</tr>
</tbody>
</table>

Table 5-14 Operationalization of the transformation cycle – version 2.
6 Results

Chapter 6 presents the research results by summarizing the theoretical foundation, research question, objectives, operationalization and the case study. This is followed by the evaluation of the frameworks, the case and the theoretical foundation. Case validity analysis includes the dependence on idiosyncrasies which impact generalizability and extrapolation. The theoretical foundation is challenged by reframing strategy, structure and systems as the three “hard” Ss of the 7S framework from the early 1980s. The scientific contribution is the answer to the research question as a synthesis of existing knowledge with operationalization, i.e., boundary spanning (Klein & Rowe 2008), representing the Sigma process of scientific evolution (Warfield 1976). In addition, building blocks for a mid-range theory between “grand” frameworks and empirical research are abstracted from the case study. Finally, managerial implications are discussed. Scientific contributions, mid-range theory building blocks and managerial implications match and overlap because they describe the same from different perspectives.

6.1 Summary

6.1.1 The theoretical foundation and the research question

Since the commercial breakthrough of the Internet in the mid-1990s, but especially during the 2010s, new strategies and structures with insighting, strategizing, managing and executing processes have been extensively discussed, conceptualized, theorized and modelled. In mainstream academic literature, key concepts include architectures and platforms, and tensional competing complementors (Wareham et al. 2014) which create ecosystems over platforms, with control points and boundary resources such as Software Development Kits (SDK), Application Programming Interfaces (APIs) and app stores between complementors and platforms (Ghazawneh & Henfridsson 2013; Eaton et al. 2015). Architectures are layered and modular, i.e., doubly distributed, firstly because of technology layers and their boundaries, and secondly because of the distributed social control and product knowledge (Yoo et al. 2010). Platforms are generative in that they enable external distributed and combinatorial innovation (Zittrain 2006; Yoo et al. 2012). This had led to new paradoxical challenges (Benner & Tushman 2015) for organizations to combine “loose and tight” – this expression borrowed from Peters & Waterman (1982) –, i.e., generativity and control (Eaton et al. 2015). Organizations need to create customer fit by orchestrating the ecosystem, or as participating complementors, but also through fast iterative internal development while at the same they need careful long-term planning and tight management for architectures and platforms.

The theoretical part of my research zooms out and back from the recent constructs and conceives ecosystems, complementors and platforms as the latest phases in expanding strategies and structures, linking the novelty to the history and epistemology of corporate, industry and networked strategies and structures. This expansion of strategies and structures has not been a one-way street. After year 2000, CSP (Communication Service Provider) and broader ICT (Information and Communication Technologies) industries retracted to enterprise architectures and networked collaborative services. Digital giants and startups
have gone forward with ecosystems and markets over platforms but may also backtrack to pipes and multi-channel business portfolios, including connected products and systems hyped at mobile world congress 2001 (3GSM 2001).

My thesis assumes that digitalization compares to industrialization as a technology-driven transformation with expanding strategies and structures. The theoretical foundation is formulated as first principles: (1) The history of industrialization and corporation as the interplay of strategy and structure with the transformative role of new technology, as chronicled by Chandler, and as a corollary, (2) the expansion of strategies and structures with new options, and (3) the fractal system theory as the operationalization of Schumpeter's views on dynamics, leadership and nested levels, such as traditionally industry, market and corporation.

This theoretical foundation of strategies, structures and systems links the research of digitalization and its vocabulary to the rich industrial era epistemology. The initial research question is: How does digitalization change strategy and structure – not only in theoretical and general terms, but the practical core concepts and methods? In this research question, change means conceiving new strategies and structures as expansions to classic ones and linking them together. Practical calls for operationalization by frameworks.

6.1.2 The objectives and the operationalization

To scope the broad research question, the thesis has three concrete objectives: (1) Starting from the theoretical foundation, to construct a set of tentative frameworks for leading the digital transformation; (2) to apply and test this set of frameworks for the transformation of the mobile communications industry into the mobile Internet ecosystem, by describing dynamic strategies, structures and systems at industry, market and corporate levels, through a retrospective fractal case study; and using the case study as an experiment; (3) to evaluate the case, and the frameworks, and to reframe the theoretical foundation, as well as to synthesize the scientific contribution and to abstract building blocks for a mid-range theory on digital transformation from the case with managerial implications.

The theoretical foundation is operationalized by visual frameworks as the synthesis of lived experience during multiple learning cycles which extend from 1980s to 2010s, i.e., covering the transitional era from classic to new strategies and structures, back then working on a no man's land between theory and practice, and now using the logic of abductive reasoning. (1) The transformation cycle (circle) describes or prescribes short experimental and long planned and managed paths for getting things done. (2) The strategy: structure alignment matrix (square) is a portfolio of dynamic strategies and structures with additive and outflanking routes. New strategies and structures expand this matrix by adding an emerging “blue traffic light” zone to the north-east, so far largely conquered by digital adjacents and startups with loose ecosystem strategies over tight platforms. (3) The kite strategy map or business model allows to describe relevant issues and movements fractally and holistically, with trajectories describing multiple and varying causalities. Alternative and eventually conflicting paths, routes, trajectories – these are called patterns in my research – and looseness vis-à-vis tightness have been discussed in literature as paradoxes.

The frameworks are further operationalized for the mobile case study by a variety of indicators and proxies, conventionally called tools. These are used for comparative and
thematic analysis which in this strategic context mean the search for what makes the difference and matters.

The transformation cycle as a circle, the strategy : structure alignment matrix as a square and the systemic kite strategy map share the fractal structure of internal business or corporate (red), network or industry (yellow/green), and outer ecosystem (blue) layers. Shown by the circle, the centrifugalization accelerates and disperses insight into execution processes. Shown by the square, new strategic and structural options emerge as opportunities and threats. Outflanking adjacents and startups are fueled with external financing even without the need for a portfolio cashcow and with the attractor dynamics of spins, clockspeeds, basins and coherence. Shown by the kite, thrusts, moves, eras and possible turns are visualized as trajectories inside the corporation, within the network and industry, and expanding to the outer Internet space.

6.1.3 The case study

The mobile case study is an experiment and empirical test for the constructed frameworks. At industry level, the primary and firsthand information sources were 12 mobile world congresses (MWC) between 2001 and 2015. Given the heterogeneity of over 500 self-documented presentations, I constructed the key themes by combining discourses inside and outside these congresses. The missing Internet insight of the global mobile industry was detected directly but the classic-biased strategy and structure was tested indirectly through a “holon” (Checkland 1981) and assuming fractality between macrocosm and microcosm. The industry-level observations were complemented by zooming in to the Finnish local manifold lead market represented by three leading service providers, shortly out to the global ICT (Information and Communication Technologies) industry, and to the then-leading company Nokia. In corporate-level analyses, secondhand information with simple event logging was used. The events were aggregated, coded and forced to the strategy : structure matrix (square) and systemic kite diagrams.

My impetus from lived experience was that Nokia seemed to miss the Internet insight but the case study showed that the Internet was a blind spot to the whole global mobile industry, including Nokia’s customers, competitors and peers. The analysis reveals the Internet as a known unknown – i.e., known to exist but in an unknown framework – and gives evidence for persevering in classic-biased strategy and structure, and for late timing. The mobile industry had been boosted by its early consumer service vision but its intent was to create and deliver billable services on internal company or networked industry structures. From this vision, the industry retreated to streamline internal structures by one-company initiatives and to enable networked B2B services for full PESTE(L) and Maslow superstacks in the 2010s. The industry was not able to compete against the external global Internet structure and the data-based financial models.
<table>
<thead>
<tr>
<th>Case fractal</th>
<th>Key observations from the data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Global mobile industry</td>
<td>Internet as the known unknown up to 2007 – looking at wrong direction, i.e., blinded by the emerging market growth and Japan with iMode as the lead market. Attempts to offer new but me-too services (which already existed in the Internet) on internal corporate and networked industry structures and by the legacy “meter and bill” financial model. Lack of speed and dynamics. Information-based business/financial models and their discovery conceived as otherness. Toward a networked B2B approach for full PESTE(L) and Maslow superstacks in the 2010s to support corporate innovation.</td>
</tr>
<tr>
<td>Local Finnish lead market</td>
<td>Retreating from the early bold consumer vision of the 1990s to corporate-level reactive strategy with downsized R&amp;D. Stacks as internal one company enterprise and extended architectures for B2B networking. Flat time-based financial models exploded volumes creating the lead market for mobile data. Post-2000 strategy and structure explained also by contemporary global management fashion.</td>
</tr>
<tr>
<td>Global ICT industry</td>
<td>Reactive post-2000 (dotcom crash and mobile timeout) B2B management fashion with enterprise solutions and B2B networking towards clouds and X as a Service (XaaS)</td>
</tr>
<tr>
<td>Corporation (Nokia)</td>
<td>Drifting from pre-Internet era hardware portfolio fit and industry-level operational dominance through an early misfit (2004-) to incoherence with the mobile Internet era (2007-). Nokia ends up as a B2B networking company serving CSPs (Communication Service Providers).</td>
</tr>
</tbody>
</table>

Table 6-1 The fractal case study observations.

The case observations are summarized in Table 6-1. Meanwhile, since 1995 and especially 2007, Internet companies created radical consumer value abbreviated as two times free (2xfree), i.e., free services (price-based markets) and more opportunities (data-based markets) by expanding strategies and structures.

6.2 Evaluations

6.2.1 Using the requirements checklist for the triangulated frameworks

A literature review in Chapter 1.3.3 – based on Porter (1994), Hamel & Heene (1994), Schön (1994) and Kay (1995, 1996) – curated a 14-point requirements checklist for a strategic framework. In Table 6-2, this checklist is used for the triangulated frameworks developed and applied in this research. The qualitative frameworks are short of quantifications (issues #8 and #12).
<table>
<thead>
<tr>
<th>Framework issue</th>
<th>As the issue appears in the triangulated frameworks tested in the case study</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Framework vs. model</td>
<td>The key constructs – the transformation cycle, the alignment matrix, the kite strategy map – as frameworks.</td>
</tr>
<tr>
<td>(2) Causal chains and boundaries</td>
<td>Fractal test plan with global industry, local market, adjacent ICT industry and Nokia. There is only one local market and one company in the case study even if both were leading microcosms.</td>
</tr>
<tr>
<td>(3) Time horizon</td>
<td>Frameworks created in iterations since late 1980s. Case study based on the mobile world congress (MWC) discourse themes between 2001 and 2015 and corporate event logging up to 2013. References to the electronic 20th century, the rise of the Internet and the evolution of strategy.</td>
</tr>
<tr>
<td>(4) Testable</td>
<td>The fractal plan tests retrospectively the frameworks using thematic analysis. Observableness answered by indicators and proxies.</td>
</tr>
<tr>
<td>(5) Administrative, contingent, operational</td>
<td>Frameworks operationalized by indicators and proxies for the specific case study purpose.</td>
</tr>
<tr>
<td>(6) Dynamics</td>
<td>Dynamics as patterns in all three frameworks: the transformation cycle, the alignment matrix and the kite strategy map.</td>
</tr>
<tr>
<td>(7) Conflicting objectives</td>
<td>The transformation cycle with multiple paths, the alignment matrix with multiple routes, the kite strategy map with multiple trajectories across dimensions and fractals.</td>
</tr>
<tr>
<td>(8) Learning and rich dynamics</td>
<td>The transformation cycle with short and long paths, the alignment matrix with additive and outflanking routes with the strategic attractor, the kite strategy map with trajectories, the map of business dynamics for insight, but no speedometer for learning.</td>
</tr>
<tr>
<td>(9) Integrative and architectural</td>
<td>The transformation cycle, the alignment matrix and the kite strategy map form together an integrated and triangulated strategy and structure framework.</td>
</tr>
<tr>
<td>(10) Relative truthiness</td>
<td>Transparent retrospective insights and strategizing as the latest phases in the evolution of strategy and structure with the explicit outscoping of planning and managing. Archived on-site self-made documentation of the firsthand MWC data.</td>
</tr>
<tr>
<td>(11) Practical usefulness</td>
<td>The frameworks as simple, parsimonious and memorable descriptions and explanations to complex phenomena. The law of Requisite Variety as an argument for multiple indicators and proxies.</td>
</tr>
<tr>
<td>(12) Managerial appeal</td>
<td>Vocabulary, visualizations, one-pagers and checklists have had a formative impact on strategy and its managerial acceptance – but quantifications are missing from the study.</td>
</tr>
<tr>
<td>(13) Minimalism</td>
<td>Starting from the first principles, i.e., Chandler and Schumpeter, using triangulated circle matrix and kite. Balancing between minimalism and oversimplification as tightrope walking.</td>
</tr>
<tr>
<td>(14) Etymology, continuity</td>
<td>Expanding frameworks linking digital transformation to rich industrial era epistemology of strategies, structures and systems.</td>
</tr>
</tbody>
</table>

Table 6-2 The 14-point requirements checklist for a strategic framework as it appears in the triangulated frameworks tested in the case study.

6.2.2 Validity, contextualization and limitations of the case study

The case study is retrospective, top-down and limited to the incumbent mobile industry which retreated from its early consumer service vision to B2B, or back to basics and Business to Business. This is just one industry even if the transformation was a remarkable shift of value and geopolitical and regional power because of ecosystems over general purpose platforms. Generalizations to other industries, markets and corporations and extrapolations to the future require to discuss the validity, context and the limitations of the case study. For this purpose, I apply the credibility, transferability, dependability and confirmability requirements from Lincoln & Guba (1985) and Guba & Lincoln (1994).

**Criterion #1: Credibility.** Most data sources at mobile world congresses (MWC) were global top leaders and companies, their strategic talk based on business backing, personally documented in writing in real-time during 15 years. This was firsthand information, and even if there were multiple parallel streams at MWCs, I followed keynotes which by definition were supposed to be the most important presentations. The limitations and potential fallacies of this kind of data and its analysis are discussed in Chapters 4.1 and 5.1. The corporate-level event logging uses secondhand information communicated, e.g., in annual reports (history...
statements) and during capital market days (future statements). Also this data is supposed to be carefully curated with business backing.

Concerning MWC attendance, it was important not only what was said and who were present but also what was not said and who were not present. Internet was this known unknown “thing” outside the MWC halls. This made it necessary to out sight and contextualize the industry analysis. In addition, the case study outscopes the planning and management issue except keeping this as a placeholder for future studies.

Lincoln & Guba (1985) viewed the credibility or believability of a qualitative research from the perspective of the participants in the research. Due to the long-time span of the research, and the large number and global spread of the people used as firsthand sources, this was not checked.

**Criterion #2: Transferability.** Is it possible to transfer the research to other contexts? I have described the characteristics of the global industry, the local market and the lead company. Therefore, the researcher who aims to apply the frameworks should evaluate to what extent his or her research context resembles or differs from my empirical research context, before transferring the results to other research.

Given the time span needed to spot the patterns of paths, routes and trajectories, and the fractal approach that consists of the global industry, the local lead market and the lead company, the availability of data becomes an obvious problem when trying to apply the research for other industries. Any research that resembles mine requires a long time. With the above reservations, and the availability of adequate data, and the operationalization by the triangulated frameworks through relevant indicators and proxies, it is possible to generalize the research but this needs an analysis of the context.

“It won’t happen to us?” The case study is retrospective and things happened in a specific context during the digitalization cycles. Past idiosyncrasies must be clarified before generalizations or extrapolations. Company investment analyses may contain multi-page lists of risk warnings and disclaimers because “past performance is not necessarily indicative of future results”. The following list of issues is not a risk radar but an enumeration of possibly relevant contextual issues from customer, resource, process and leadership perspectives, picked from the frameworks and case.

The mobile Internet was initially driven by communications and media, expanding next to retail and finances. Now it is trickling down from “digital that’s fun to digital that matters” (Frank et al. 2017), i.e., to housing and hospitality, traffic, energy, urbanization, health and work. Isaacson’s (2014) history of digitalization depicted the PC, the Internet and the mobile Internet as primarily consumer-driven revolutions. Anderson (2009) and Isaacson (2014) highlighted radical customer value expressed by lower prices and more opportunities, here abbreviated two times free (2xfree). The past “killer apps” were based on scalable pure software, ungebunden to places, people and equipment, they were neither Online to Offline (O2O) – also called Cyber-Physical Systems (CPS) – nor operations heavy. Instead, the breakthrough of gebunden Machine To Machine (M2M) solutions was delayed from the early vision at mobile world congress 2001 (3GSM 2001). Is it possible that the future innovation decelerates because of its gebunden hardware, analog and people elements, i.e., connected products and systems?

81 Concerning PCs, Isaacson’s analysis can be contested because the first personal computers I used – those from Olivetti, Wang and HP – were still expensive and utilitarian business tools.
The timely and early availability of software skills and platforms was a key resource for the rise of the complementary Internet services. But technology risks have been realized in the history, exemplified by the artificial intelligence (AI) winter in the 1990s. Kai-Fu Lee (2018) identified four phases in AI: Internet AI, business AI, perception AI, and autonomous AI. The successful data-based and algorithmic business models have been based on Internet AI and business AI goes on with narrow applications. Are perception and autonomous AI difficult to scale, compromising another AI winter?

Innovation was accelerated by the lavish availability of external capital for institutionalized go-to-market processes from research to innovation proper to diffusion and scaling by Initial Public Offerings (IPO) and acquisitions (Kogut 2003). This provided huge incentives for individuals and teams to develop relatively easy complementary offerings over existing platforms. How about the more complex and integrated solutions?

Entrepreneurial mindset instituted itself in committed developers, investors and managers aiming at domination by speed. Schumpeter (1942/2008:132) predicted that due to rising barriers and complexity, entrepreneurial innovation gives way to corporate planning (Sauberschwarz & Weiss 2018).

The privacy culture varies so that the Chinese are most willing to share personal data for benefits (not only for Internet giants Baidu, Alibaba and Tencent but also for the governmental social credit system), the U.S. is in the global middle cohort, whereas the Germans and the Japanese are most protective for their privacy (Meeker 2018:205-2011, 223). An example is face recognition. Kai-Fu Lee (2018) argued that such differences will split the global Internet and boost the Chinese consumer AI.

The rise of the Internet happened in an era of non-existing regulation in the U.S. *laissez-faire* or “let go” environment of communications and media, enabled by the common law (Levy 2011). Regulation was discussed by, e.g., Zittrain (2006), Benkler (2006) and Mayer & Schönberger (2017) and it became a topic in mainstream political discourse in 2018, enforced by European General Data Protection Regulation (GDPR) and copyright directive. The envisioned future domains of digitalization have been traditionally intensively regulated. To what extent consumer or business freedoms have to surrender to hierarchies and surveillance?

Internet profited from and worked for globalization with the only major divide between the U.S. and Chinese versions. Local regulations may risk the further splitting of the Internet to what is called “Splinternet”.82

As a summary of the contextuality, the above list outlines issues which may slow down and redirect the future instead of extrapolating the past. What is called context here was also a topic in classic strategy, contingency theories and open system thinking as the fit between an organization and its business, technology or regulatory environments (e.g., Burns & Stalker 1961/1994, Emery & Trist 1965, Katz & Kahn 1966/1978, Lawrence & Lorsch 1967, Ansoff 1978, Leinwand & Cesare 2010). A context has been often defined as the opposite to core or as non-core but here the context is elevated to a factor in strategic era analysis. It is possible that a context becomes the new core as in the mobile industry analysis where data as a context became the core.

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82 Internet was started as a political war-proof infrastructure initiative. The historic fragmentation and emergence of the Finnish telecommunication service industry was also a result of political reasoning and action during the 19th century to keep the Imperial Russian government out.
Another transferability issue is that the case study indicators and proxies are crafted for the particular qualitative analysis of what makes the difference and what matters in the cohort, instead of representing any general commensurability. Depending on other cases, and the data available, new checklists, metrics and other tools need to be discovered and tested case by case in other, both large sample and in-depth studies. In large cross-industry surveys, real-time and forward-looking windshield benchmarking measures for digital competitiveness are needed. This is a never-ending versioning process and challenge.

**Criterion #3: Dependability.** Dependability as a Lincoln & Guba (1985) validity criterion deals with the changes in the research setting. What are the changes that have occurred in the research setting and how these changes have affected the way the researcher approached the study?

The Internet (from 1995-) and mobile Internet (from 2007-) cycles were reminiscent. To my eyes and ears, the inflection point from mobile telecommunications to mobile Internet between 2006 and 2007 was lucid and encapsulated in the mobile world congress (MWC) keynote speech of Arun Sarin, then-CEO of world’s largest Communication Service Provider (CSP) in 2007. The only essential detectable changes at MWCs between 2001 and 2015 were the phenomenal growth and the Triadian (European, American, Asian) geopolitics and powershifts, especially the rise of first emerging markets and then the U.S. and China as lead markets. Besides visiting politicians (mostly from the emerging markets), politics in PESTE(L) did not play a visible role unlike what is possible in the next cycle assumed in the research as Internet of Everything during The Roaring Twenties.

As a summary, nothing prevented, skewed or distorted the access to firsthand data between years 2001 and 2015. In addition, due to the Internet, the business and research literature as the secondhand data and the marketplace of ideas and frameworks was completely open and easily accessible. In this sense there were no essential changes in the research setting.

**Criterion #4: Confirmability.** Is it possible to confirm the results or is there anything that contradicts them? Qualitative research assumes that each researcher brings a unique perspective to the study (Creswell 1994:5) and confirmability refers to the degree to which the results could be confirmed or corroborated by others.

The event logs in Chapter 5 are compiled from publicly available quality data and as such they are easy to confirm. The MWC part of the case study is unique in the sense of a flowing river but the archived on-site MWC firsthand reports makes it transparent so that the observations since 2001 can be confirmed independently of the researcher. But only to a limited extent, because these reports have been written by myself as the researcher. There was no double coding or interrater reliability where two or more people observe the same raw data or events (Boyatzis 1998:150). The competence requirements for coding – “the ability to see” (Boyatzis 1998:7) – are pattern matching, system thinking and tacit knowledge, i.e., theoretical sensitivity, as well the cognitive complexity to conceptualize the system of multiple causalities. Boyatzis (1998:65-66) also discussed the “left out” problem: what aspects of phenomena might not be noted? This issue of latent and external out-of-the-box information played a crucial role in my research and is the core idea in the framework of expanding strategies, structures and systems. In addition, the goal of system thinking is to reveal gaps and holes in empirical research, and even in mid-range theories, “things” that exist but have been omitted, unknown knowns that theoretically (as knowns) exist but have not been detected yet (as unknowns).
The main limitation of the research is the explicit outscoping of planning and management issues. In addition, behavioral theories are skipped. Albeit fractal, the top-down "galactic" case study does not zoom insighting into micro-level cognitive, sensitizing and decision processes and to the beliefs and behaviors of responsible individual people and teams, even if some of those are mentioned. There is a huge stream of behavioral research on organizations and their transformation, both descriptive and prescriptive, starting with Cyert & March (1963), with Henfridsson & Yoo (2014) and Dattée et al. (2018) as recent examples from research, and Schrader (2017) and Sauberschwarz & Weiss (2018) from consultancy.

In behavioral research, the focus is on individuals and teams, their perceptions on organizational and industrial change and their behavior during the change. Business histories tend to zoom in to key people and their beliefs, competences and behaviors in moments of change, both to those who make decisions and those who are impacted as employees, customers and sometimes competitors. My thesis – even if it shows that the mobile industry and the leading firm did not get the change – does not aim to contribute to behavioral mid-range theories but stays in the domain of strategies, structures and systems.

A conscious but less explicit limitation is that the strategy : structure framework now consists of only one matrix whereas the precursor service : channel framework (Mäkelin & Vepsäläinen 1989) as a whole added two more matrices, one for the service, the other for the channel. So there were three matrices altogether. The service matrix axes were complexity and contingency : customer relationship which classified services on a continuum between relationship- vis-à-vis efficiency-based contracts (Williamson 1985:24). The channel matrix was defined as social organization : technology. It conceptualized the organization as a socio-technical system and classified channels on a continuum between high touch and high tech. The reason for this simplification is that those two add-on matrices were infrequently used because there seemed to be an obvious built-in fit in them, analogously to the doubly distributed technological and social structure in Yoo et al. (2010).

6.3 Scientific contributions

Scientific contributions are divided into two parts. The first part answers the initial research question with its focus on “change” and “practical”, i.e., boundary spanning. Based on the case, the second part abstracts building blocks for a mid-range theory from the case. The case context – i.e., the strategic era – forms the specific environment to be taken into account instead of straightforward generalizations and extrapolations. Kindred approaches have been called open system and contingency theories.

6.3.1 Scientific contributions part one: the research question answered by boundary spanning

The initial research question is not new or rare. In many formulations, it has been – and will be – discussed and answered in thousands of interviews, articles and books, in different ways, by executives and entrepreneurs, consultants and researchers. New strategies and structures with related insighting, strategizing, managing and executing processes have been extensively discussed, conceptualized, theorized and modeled.

What is a novelty in this research is conceiving digitalization as an extension to industrialization using the Chandlerian and Schumpeterian theoretical foundation formulated as the first principles and operationalized by the constructed triangulated
frameworks. This longitudinal and structural synthesis – with conflicting paradoxes, portfolios and multiple changing causalities in strategies, structures and systems as paths, routes and trajectories, i.e., dynamic patterns – has not been presented elsewhere. Linking classic and new makes also possible to reverse, as happened in CSP (Communication Service Provider) and ICT (Information and Communication Technologies) industries after the dotcom crash and mobile timeout in the year 2000, and what is possible with vertically connected gebunden products and systems.

Emphasizing the words change and practical in the initial research question, it entails a boundary spanning agenda (Klein & Rowe 2008) to address gaps (1) in theoretical knowledge by bridging classic and new strategies and structures through the strategy : structure alignment matrix, but also (2) by linking digitalization and (especially ICT) management especially through the transformation cycle. Using the kite, the research (3) rehabilitates the use of system theory for social system analysis. The triangulation is used to (4) brutally operationalize the theoretical foundation. Finally, (5) the case study with the frameworks gives a novel explanation to the Nokia case.

Figure 6-1 summarizes the contributions one to four over the triangulated frameworks using the case study Figure 5-10. The novel explanation to the Nokia case is the fifth contribution. These contributions explain the frameworks and how they were used in the Nokia case, but do not yet contemplate how the case study enhanced and enriched the frameworks with possible generalizations to other contexts and what were the opportunities and hypotheses for future research revealed in the case.

Against this background, it is somewhat artificial to discuss the contribution and implications in terms of the distinction between scientific and managerial because the boundary spanning aims at bridging these perspectives and communities of practice and at fading out this distinction.
Contribution #1: Bridging classic and new strategies and structures through the expanding strategy: structure alignment matrix. Some scholars who have followed strategy for decades have argued that it looks like strategy both as a discipline and as a service has been in a standstill since the 1990s (Kiechel 2010, Spender 2014). During this era of claimed stagnation, irrefutable numbers show that, in the 2010s, strategy as a practice neither obstructed the multi-trillion value migration to startups and adjacents, nor revenue and powershifts across industries, nor towards customers, nor across global and regional geographies. In some cases, star companies assumed as professionally managed disappeared in black holes, including Nokia’s device business. Before that, the dotcom crash as the result of missing strategies and business model failures in the late 1990s was highlighted by DaSilva & Trkman (2014). These two anomalies violate the expectations of classic and new paradigms (Kuhn 1962/1970:52-53) and are rationales for the initial research question to link classic and new strategies and structures. The expanding frameworks go back to the first principles to link to the past, are designed to integrate what is new and to be open for future developments.

In a panel discussion on this topic, especially concerning Nokia’s problems (Tivit, Espoo, September 27, 2012), Dr. Matti Lehti – the former President and CEO of TietoEnator Oyj (1989-2005) and the Chancellor of Helsinki School of Business (2005-2009) – called for reforms in Finnish management education and research. But he did not mention that this was a global challenge as well – Finns had followed the global industry and the advice of strategy dignitaries who understated new strategies and structures.

Since that, during the 2010s, new strategies and structures have been addressed in mainstream strategic management, information systems, and economics research, often
separately (Constantinides et al. 2018). As a result of this, there is a rich literature on new strategies and structures with related insigthing, strategizing, managing and executing processes, e.g., in papers published in Information Systems Research, Organization Science, and MIS Quarterly journals. Key concepts include architectures and platforms, and tensional competing and complementing players (Wareham et al. 2014) over platforms, with technological and social boundary resources such as Software Development Kits (SDK), Application Programming Interfaces (APIs), app stores, incentives, intellectual property rights, and control points between complementors and platforms (Ghazawneh & Henfridsson 2013; Eaton et al. 2015; Karhu, Gustafsson & Lyttinen 2018). These resources are to “unlock ecosystem advantage” (Williamson & Meyer 2012). Architectures are layered and modular, i.e., doubly distributed, firstly because of technology layers and their boundaries, and secondly because of the distributed social control and product knowledge (Yoo et al. 2010). Platforms are generative in that they enable external distributed and combinatorial innovation (Zittrain 2006; Yoo et al. 2012). This had led to new paradoxical challenges (Benner & Tushman 2015) for organizations to combine “loose and tight” – using the expression from Peters & Waterman (1982) –, i.e., generativity and control (Eaton et al. 2015). Organizations need to create customer fit by orchestrating the ecosystem, or acting as complementors, but also through fast iterative internal development while at the same time they need long-term planning and tight management for architectures and platforms.

The theoretical part of my research zooms out and back from the recent constructs and conceives ecosystems, complementors and platforms as the latest phases in expanding strategies and structures, linking what is new to the history and epistemology of corporate, industry and networked strategies and structures.

The early strategy research suffered from the lack of operationalization – i.e., “administratively sophisticated, contingency-sensitive and operationally subtle theory” (Hamel & Heene 1994:2) – which delayed its breakthrough (Rumelt et al. 1994, Kiechel 2010, Spender 2014, Kotter 2014). Similar criticism has been presented on social system theory (Merton 1949/1968) and complexity theory (Stacey 2012). This criticism serves as a rationale for the operationalization focus.

The expanding and operationalized frameworks with the case study confirm that classic corporate and industry strategies and structures with related logics have been inadequate in digitally rich environments and the firms needs to expand their strategic focus to external environment and relationships and their governance. Strategies and structures are fractals that operate simultaneously at global, local and firm levels in ways where traditional industry and firm boundaries do not hold.

**Contribution #2: Linking digitalization and (especially ICT) management through the transformation cycle.** Discussed in Chapters 3.3 and 3.4, an extensive and emerging literature addresses the gap between digitalization and ICT management with iterative design (why), lean (what) and agile (how) methodologies different to classic linear planning and managing (e.g., March & Smith 1995, Ries 2011, Sein et al. 2011, Osterwalder et al. 2014, Henfridsson & Yoo 2014, Schrader 2017, Gloger 2017, Dattée et al. 2018).

The paradoxes of change have been discussed in information systems research as the opposing but simultaneous logics of stability and flexibility (i.e., planning and emergence, Tilson et al. 2010) so that boundary resources (Ghazawneh & Henfridsson 2013, Eaton et al. 2015) are the solution for the control and generativity of platforms. This discourse is embedded in the fractal transformation cycle and its Gearshift Knob diagram with multiple
and co-existent paths, typically long and slow planning paths for structures, short and fast learning paths of discovery and customer fit for strategies. This tells that the dynamics of the insight into execution paths are different. Based on the case, one also needs sensemaking frames to sensitize fast such as those proposed in the research.

Another link between digitalization and (ICT) management is the system-theoretical kite where strategic patterns are associated with Gantt diagrams which are standard tools in managing programs and projects. In addition, datafication improves systemic observability with new measures.

**Contribution #3: Rehabilitating system theory for social system analysis through the kite.** In addition to strategy and structure, system theory as the third key industrial era construct is used to conceive dynamics, fractality and purposefulness. System theory has been proposed or applied also for digitalization (Bauer 2014; Schultze & Whitt 2016; Benner & Tushman 2015; Dattée, Alexy & Autio 2018; Hvistendahl 2018; Wang & Li 2018).

The fractal kite is the system-theoretical operationalization of Schumpeter’s views on dynamics, creative leadership and fractality, integrating functional, general and ecosystems (Parsons 1951, von Bertalanffy 1968, Moore 1996), and inheriting as the “child object” the properties and behaviors of the system “parent object” with rich epistemology. As applied in the research, the kite as a system brings together four schools of management and strategy as dimensions – resources, processes, customers, and leadership –, bridges classic and new strategies conceived as patterns, and fills gaps between theory and practice by dots as measures (e.g., Key Performance Indicators and datafication) and dynamic patterns as Gantt diagrams. Dynamic strategies as thrusts, moves, eras and possible turns are visualized as trajectories inside the business and corporation, within the industry and network, and expanding to the outer Internet space.

Ostensibly, the kite differs from the complexity or Complex Adaptive Systems (CAS) theory which has been perceived as missing operationalization (Stacey 2012). However, the first principles of CAS (Benbya & McKelvey 2008) – adaptive tension, internal complexity, internal change rate, modular design, positive feedback, multiple causes, and rhythmic alternation of causal dominance – can be operationalized by the kite as a dynamic and fractal system. The explicit leadership dimension in the kite together with the separate insight into execution framework makes another difference to adaptive and passive system frameworks derived from biological metaphors (e.g., Parsons 1951, Ashby 1956) as discussed in Chapter 2.4.1.

In the case study, the kite is applied to describe the strategy maps but it can also present the more operational business models (Mäkelin 1998).

**Contribution #4: Brutally operationalizing of the theoretical foundation.** The theory-practice gap was discussed by Klein & Rowe (2008) as the relevancy problem and used as an argument against system theory by Merton (1949/1968). To contribute to the bridging of this gap, my research proposes and tests simple, visual and integrative triangulated constructs. These are further operationalized by case-specific indicators and proxies for thematic analysis. Auxiliary constructs – the slideruler, the trident and the attractor – are introduced to support the discourse on value-adding vis-à-vis outflanking routes, multiple strategies and structures in the portfolio, and new dynamics with spins, clockspeeds, basin and coherence. Because of operationalization, the triangulated frameworks partly answer to the requirements for a mid-range theory although they can also
be conceived as “all-inclusive systemic efforts to develop a unified theory” (Merton 1949). Instead of such a “grand theory”, the frameworks should be seen as the synthetic Sigma trend in the scientific evolution (Warfield 1976).

**Contribution #5: A novel explanation to the Nokia case.** Many books – referred in this research – have been written on Nokia’s rise, fall and/or recovery as a different company. They typically focus on the star (Nokia), maybe to some extent on its planets (Nokia’s network, Lindén 2015), but not on the big picture of the galactic collision, aliens and black holes in the expanding space, i.e., they stay inside the classic box of the expanding strategy: structure matrix. Similar box-thinking shows up in McNish & Silcoff (2015) history of BlackBerry, a key competitor to Nokia. The fractal outside-in approach of this research makes a difference to existing corporate-focused approaches.

The analysis of Nokia made by Doz & Wilson (INSEAD, 2018) is based on lived experience, voluminous multi-disciplinary scientific references and explicit methodology. It is useful to compare my research to this in order to highlight the difference and the contribution. Doz & Wilson (2018) identified largely the same Nokia events but gave a somewhat different explanation because of their corporate focus. They referred to classic strategy and structure literature in interpreting the Nokia event log, with three a priori research questions as initial hypotheses and explanations (Doz & Wilson 2018:2):

- Was the fate of Nokia unavoidable, a Schumpeterian creative destruction? Population ecologists predict that management matters less than macrosocial processes, the success or failure comes from environmental fit and selection (Hannan & Freeman 1977, 1984; also Christensen 1997 and Porter 1990).
- Was the fall about organizational evolution and adaption gone astray in the time of disruption and business model change, with creeping behavioral and heuristic commitments (Nelson & Winter 1982, Cyert & March 1963).
- Was this case simply about failure of management volition, according to environment-strategy-structure paradigm (Chandler 1962).

Doz & Wilson argued that these explanations should be combined and that there was no single, simple answer (2018:3). The early success was an opportunistic evolution and adaptation with macrosocial processes during a “planetary alignment” (2018:26). Doz & Wilson identified three phases in the fall: up to 2006 with isolated bad decisions (managerial volition); 2006-2010 as stunted evolution (drifting adaptation), and after 2010 as external selection (ecology).

As to managerial volition, Doz & Wilson found small mistakes, not a single big one, but multiple interdependent decisions. These included the overshooted hardware segmentation, the long creeping commitment to the aging and fragmenting Symbian without a sense of urgency and especially the matrix organization of 2004 which led to top management turmoil and further to “strategic vacuum”.

My research points to a few big issues. The missing Internet insight was an industry-wide phenomenon and the corporate-level analyses showed evidence for classic-biased and incoherent strategy and structure. For instance, I noted that Internet was conceived as services and not as a platform at Nokia Capital Market Day, Dec. 4, 2008. Doz & Wilson seemed to be unsure about the insight. They invoked the early Internet understanding in top leaders’ talk in 1999-2000 – such as “the twin drivers of the Internet and mobility” (Steinbock 2003:432) – to conclude that “any leadership and managerial failure was not one of cognition” (Doz & Wilson 2018:3). Instead, they explained that the existing top
management cognition did not trickle to the middle management (2018:81). They scheduled the lack of insight and technological competence in the Nokia’s top team to the post-2004 era with interviewee comments like “Internet quasi knowledge” and “right words to mask the lack of right skills” (2018:116).

Siilasmaa’s book (2018) can be interpreted so that Nokia’s board and management did not have the Internet insight. Siilasmaa wrote that the Nokia board made – as in classic strategy – a clear difference between what is strategic vis-à-vis operational. Even the operating system software was a hands-off topic for top management, i.e., delegated to middle management as an operational issue.

Doz & Wilson argued that especially harmful was Nokia’s matrix organization introduced in 2004. Zooming out, at the same time, e.g., Amazon was horizontalizing its structure to a platform with open interfaces so that the social and business structure followed the enabling technology structure (Tilson et al. 2010). Carving out a single platform for internal and external businesses was not a wrong idea but at Nokia it was executed with the primacy of the social organization and internal processes, the classic matrix organization instead of the Internet as a platform for a co-evolving ecosystem for complementors. It created rather than eliminated managerialism and hierarchy instead of accelerating markets and ecosystems. Nokia’s matrix was not a coherent alignment matrix, it focused on internal social organization to the detriment of external open technology structure and boundary resources (Ghazawneh & Henfridsson 2013, Eaton et al. 2015). Nokia insourced the messiness of markets and ecosystems inside the company instead of outsourcing it.

There are similarities between my research and the research conducted at INSEAD. Doz & Wilson noted that Nokia was in problems (2004-) before Apple and Google entered the markets (2007-) due to the product-market strategy (McKinsey’s pockets of growth theory in Chapter 3.2.2) and fragmented structure. Doz & Wilson indirectly and tacitly revealed that Nokia built on pre-Internet assumptions. The management followed textbook approaches and did bona fide what mainstream classic strategy consultants and researchers had said, e.g., focus on your core, Internet is not important, forget so-called business models and ecosystems, prevent value migration.

Doz & Wilson presented a hypothesis of a co-evolution lock-in with European operators around the delayed 3G. This found support in my research as the missing industry-wide Internet insight and the schism over value-added services, e.g., the Club Nokia episode followed by a refocus on hardware. The mobile industry was never able to commercialize 3G and 4G, external innovators were needed (Kogut 2003, Willetts 2012, Kohli 2013). Nokia was the last man standing among the phone makers (Doz & Wilson 2018:144), but the late market entry of Apple with a combined vertical-horizontal structure – i.e., tightly integrated hardware and operating system with app store and other boundary resources – demonstrated managerial volition, falsifying the unavoidability of the Schumpeterian destruction hypothesis.

Doz & Hamel (1998) had denied ecosystems as a simplistic answer to complex business problems. Compared to Doz & Wilson (2018), my tentative frameworks give a different but simple interpretation for the Nokia case, highlighting the (missing) industry-wide Internet insight and the (lack of) coherent technology-based open external structure and strategy at the corporate level. These are my clear core arguments. While my research epitomizes the surrender of a corporate and an industry strategy and structure to ecosystems, predicted by multiple writers since the mid-1990s (Chapter 2.3.2), and studied extensively during the
2010s, the case study concerns just one industry, a small lead market and the global lead company, and extrapolations and generalizations require more cases.

To summarize this part one of the scientific contributions, starting from the theoretical foundation as first principles, the research sees digital transformation as an expansion of strategy and structure, linking digitalization and (especially ICT) management, with rehabilitated system theory, together with brutally operationalized triangulated frameworks and with a novel explanation to the case Nokia. Notwithstanding this, the frameworks of strategy, structure and systems are not intended to constitute a “grand theory” but to represent the synthetic Sigma trend in the scientific evolution.

6.3.2 Scientific contributions part two: toward a mid-range theory on digital transformation

Mid-range theories are halfway between “grand” system theories and empiricism (Merton 1949/1968), resulting from top-down disintegration (Pi trend) and bottom-up integration (Sigma trend) (Warfield 1976). In science, a theory denotes a rational and abstract generalization so that the specifics of the cases can in principle be generalized into other contexts whereas in colloquial language a theory may mean the opposite to practice. In this Chapter, a mid-range theory means the enhancement and enrichment of the strategy, structure and system frameworks based on the experiences from the case study, together with some contemplated and hypothesized needs and opportunities for future research. A mid-range theory focuses on some part or feature of the triangulated frameworks, using the case to explain why a process unfolded in a particular way and are there some generalizable explanations of processes which might emerge and which could be narrated based on the logics of the frameworks being used. Like the initial research question, the mid-range theory building blocks proposed here are more about epistemology than ontology, about methods rather than predictions. These building blocks are enumerated as a continuation to the above list of scientific contributions.

The frameworks describe moves by empirically detected patterns. Figure 6-2 lists potential mid-range theory building blocks over the triangulation Figure 5-10 by abstracting findings from the case that might be generalizable from the lead market of communications and media to other context, i.e., relevant for the Internet of Everything during The Roaring Twenties. The numbering starts at six continuing the former list of contributions. Numbers six to eight are dynamic patterns and number nine describes the coherence between these patterns and the environment.
It is not that some specific pattern – path, route or trajectory – is separately right or wrong by some indicator but that patterns are coherent with other patterns and the environment. The patterns came true under specific conditions including the opportunity for ungebunden pure software services, timely and early availability of software skills and platforms, lavish external capital, huge incentives with low barriers of entry, “let go” regulation with a permissive privacy culture, and born-global scale and basin.

**Contribution #6: The shaping dynamics and patterns of fractal strategies and structures sensitive to environment.** This answers the question hidden in Table 2-1, i.e., what can happen between classic and new strategies and structures now with the focus on dynamics which was understated in classic strategy and early functional system theories. A company can aim at the platform orchestrator (leaping along the y-axis) or be content as a participant in the ecosystem (along the x-axis). It can play different simultaneous roles on different platforms and in different ecosystems (Venkatraman 2017). Otherwise the literature on how to move from classic to new strategies and structures – the slideruler issue – is controversial. The views differ on outside-in (learning from customers and digital giants) vis-à-vis inside-out (staying close to core and focus on incremental revenue) approaches.

The case shows both fast and slow patterns of routes and movements both forward and backward. In the case, outflanking moves faraway along the axes of the strategy : structure alignment matrix were faster and more value-creating than short additive close-to-core diagonal moves, planned industry collaboration included (e.g., in rich media). In 2018, the valuation of the largest platforms was in the range of $1 T (the north-west corner of the matrix) and successful complementary startups – “unicorns” – were by their definition
valued above $1 B (the south-east corner). At the same time, incumbent ICT companies for enterprise and networked B2B services located in the south-west corner and in the middle of the matrix, with leading IT companies valued in low-three digit range (of billions), and incumbent Communication Service Providers (CSP) and Communication Technology (CT, such as Nokia and its peers) companies in the double-digit range (Figure 1-1). In the case study, CSPs moved backwards to one company initiatives with in-market consolidations as well as to provide B2B services. At the same time, Internet giants moved toward providing expansive B2B services.

What happened in the case was “the fastest technology change ever”, it “happened in only two years”. Proactive lean paths, outflanking routes and customer-driven moves created value by the four criteria (market capitalizations, revenue growths, customers, geopolitics and regions) discussed in Chapter 1.2. A counterexample was the slow customer adoption of Internet of Things (IoT) compared to predictions in 2001.

The velocity and apparent ease of the outflanking was detected and modeled by Bryan et al. (1999). They predicted that this situation is transient and called the coming end-game shaping (as in Docomo’s vision Shaping a Smart Life) where fast asset-light Internet companies and slow asset-heavy traditional firms in some hybrid way co-exist or merge. Back then, and in the case study later, the speed was possible because of pure ungebunden software solutions and non-existent “let go” regulation with a permissive privacy culture. As a conclusion, the expansion of strategies and structures is likely sensitive to the environment so that the velocity slows down in complex gebunden hybrids and due to regulation. On the other hand, regulation may act as an accelerator, and here the example is also IoT with mandatory metering and tracking.

As a summary, it was shown that classic corporate and industry strategies and structures are inadequate in digitally rich environments and the firms needs to expand their strategic focus to external environment and relationships and their governance. Strategies and structures are fractals that operate simultaneously at global, local and firm levels in ways where traditional industry and firm boundaries do not hold. But this shaping dynamics and the patterns of fractal strategies and structures are sensitive to the environment. The routes of movements and the diffusion of innovations slow down when the solutions become more complex gebunden hybrids. This leads to intricate competing and complementary shaping patterns and portfolios, such as those in Figure 6-2 (the alignment matrix in the south-west corner of the triangle as the description of the case) and give incumbents more time to adapt. Regulation can act as a decelerator or an accelerator. The strategy : structure alignment matrix is a framework for shaping scenarios schematically resembling those in the service : channel matrix (Mäkelin & Vepsäläinen 1989).

**Contribution #7: Getting things done by mapping, casting and integrating 360-degree insight into execution paths.** The transformation cycle is about getting things done from insight into execution. The case study detected fast and slow, and centralized and distributed patterns of paths.

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83 According to International Unicorn Club, there were 325 such companies in March 2019 with a combined valuation of $1.1 T. https://www.cbinsights.com/research/unicorn-startup-market-map

84 Before the dotcom crash and mobile timeout, Bryan et al. (McKinsey, 1999:121-128) noted that Internet “specialists” – i.e., outflanking pure play strategies – create much faster and more value than traditional “geographical integrators” – i.e., additive strategies. Bryan et al. used isoquants and moves in the (company performance) : (company size as its book value) coordinate system — “the strategic control map” – to demonstrate their findings.
Kogut (2003) identified overplanning together with the legacy “meter and bill” financial model as the two key reasons for the European laggardness in The Global Internet Economy. Since that, literature has discussed the paradox of planning vis-à-vis emergence – which was a topic already in the 1950s –, and that of planned platforms vis-à-vis emergent distributed, collaborative or in-house strategies, also with concrete how-to guides.

The case study has many observations on speed which call for modeling and measuring the dynamics of the paths. This can be marked by Greek letter Tau which is the symbol for “time constant” in system dynamics. Tau measures the delay needed to act or respond. There are swarms of Taus with nested loops and preset clockspeeds, the rhythm, from intra-day practices to weekly and monthly plans and releases. At the uppermost level, Tau is the sum of the times needed for insighting, strategizing, planning and managing, and executing. Tau can be divided to activities at multiple resolutions, such as Boyd’s classic Orient-Observe-Decide-Act (OODA, Richards 2004) loop or the process models of Henfridsson & Yoo (2014:946) and Dattée et al. (2018). According to Boyd, a fighter pilot, the goal is to get inside the enemy’s loop to win. Ansoff’s (1978) conclusion was that the company speed must be higher than that of its environment but not too much higher. In the case study (MWC 2012), Boyd’s and Ansoff’s conclusions were tacitly referred by John Chambers, CEO of Cisco. In the late 2010s, business literature has adopted the expression “China speed”.

The case study showed a failure in industry-wide insighting. Insighting is the latest phase in the century-long sequence of executing to planning and managing to strategizing to insighting or 4-3-2-1 in the quadrants of the transformation cycle circle, these phases timed roughly to 1910-1950-1970-2000. Complex dynamics, blurring digital boundaries, combinatorial innovation and external financing without existing portfolio cashcows have built up the role of insighting with increased and accelerated opportunities and threats. Despite a rich literature on insighting, the results shown by the case and the methodological youth designate incompleteness and immaturity (Jaruzelski et al. 2013). Insighting is not only about the process or data but also the framework used to interpret the data as modeled by the 2x2 matrix of knowns and unknowns (Figure 3-1). The insighting problem in the case was less in available data than in the missing framework, i.e., the Internet was the known unknown. A broader historical review shows that new strategic frameworks introduced since the mid-1990s were long undervalued, misunderstood or resisted by strategy dignitaries. In addition, global aggregated market data – i.e., emerging market growth with a low-end bias – was used for extrapolation instead of disaggregated lead market data which would have had predictive value in showing the true dynamics of the market.

In light of the retrospective case study, environmental complexity with varying speeds, and future challenges of shaping strategies and structures, the role of insighting calls for a holistic, formalized and prescriptive 360-degree process view of the layered transformation cycle to substitute “box thinking”, “gut feelings”, “management fashion” and “fighting previous wars”. This process needs tools for all quadrants and layers of the circle. Fortunately, there is a rich literature on processes and tools but also the framework is needed.

As a summary, a swarm of Taus describes the rhythm of renewal. There are fast and slow paths conditioned to environment and to be mapped, casted and integrated into a 360-degree pattern of “who does what, when” (Lorange & Vancil 1976). Insighting needs to challenge existing frameworks and look for nascent ones as well as for disaggregated data to detect the true dynamics.
Contribution #8: Inheritance of system properties, i.e., incumbents and invaders are not only phenomena but should be reimagined as systems, bringing “system back to ecosystem”.

System theory is the most powerful and established of the three frameworks and the kite as the “child object” inherits the properties and behaviors of the system “parent object” with rich epistemology. From this perspective, the case revealed “same but better”, i.e., incremental, additive and reactive strategies where the tacit system-in-use resembled Parsonian functionalism or Ashby’s reactivity instead of the views of, e.g., Schumpeter (dynamics, leadership, nestedness; 1942), von Bertalanffy (general system, 1968) and Moore (ecosystem, 1996). Thus, system thinking helps to reveal gaps and holes in practice, “things” that exist but have been omitted, unknown knowns that theoretically exist but have not been detected yet. In natural sciences, experiments are used to search for, or verify or falsify theoretical assumptions. In social systems, as discussed in Chapter 3.3, incremental lean answers to “what”, agile to “how”, and strategic experimentation – such as outflanking competition and creating radical customer value – to “why” questions.

The rationale for system thinking includes observability as a requirement to controllability. Critical Success Factors (CSF), Critical Business Issues (CBI) and Key Performance Indicators (KPI) as dots in the kite strategy map are simple past measures. Measures with predictive power instead of “vanity metrics” have been the challenge answered by, e.g., One Measure That Matters (OMTM, Croll & Yoskovitz 2013) or velocity (Constantinides et al. 2018) although simple industry-level performance measures were proposed already in classic management and strategy. Digitalization has also been measured and benchmarked by complex indices and tracked by corporate scorecards (Schönblom & Egle 2017).

The availability of data – “more, messy, good enough”, i.e., “Big Data” (Mayer-Schönberger & Cukier 2013) – boosts the formulation of detailed but temporary “low-range” theories and measures as interpretations of that data – “the minor but necessary working hypotheses that evolve in abundance during day-to-day research” (Merton 1949) –, not necessary strongly causal but at least correlative. Data and algorithms are expected to play a transformational role in enabling new structures and strategies even if possibly advancing centralization and monopolization (Mayer-Schönberger & Ramge 2017). According to the Chinese view (Wang & Li 2018:711), micro-level datafication, classification and analysis of human behavior and action systems lead to truly scientific management of social systems and to a better society. Chinese Internet giants Baidu, Alibaba and Tencent (BAT) already have unparalleled broad and deep integrated data from their customers.

Beyond communications and media, streams of data come from connected products and systems. E.g., a McKinsey (2015) study classified Internet of Things into nine settings – human, home, retail environment, office, factory, worksite, vehicles, city and outside. These data sources are gebunden to places, people or other physical contexts. Always-on ubiquitous connectivity creates two-way data pipes which may transform products to predictive services with better understanding of and value for the customer. Datafication and learning algorithms as strategic drivers inside corporations may be classified seccreties (Mayer-Schönberger & Ramge 2017).

The Internet was the known unknown in the case study, i.e., there was some macro-level data on it but no “grand” framework to interpret and understand it. This thesis has synthesized and tested a triangulated framework for the Internet, tools included. The agenda
then becomes to use the known framework to continuously search for data and to formulate micro-level “what” and more strategic “why” hypotheses for learning experiments.

Another and holistic aspect in system thinking are the alternating causal trajectories as thrusts, moves, eras and possible turns. In the kite shown in Figure 6-2 (the south-east corner of the triangulation), these are described by arrows which can be deepened into Gantt charts so that the strategy map tells if a program or project in question is strategy-driven, whether the strategy is fully operationalized as actions, or whether there are systemic gaps and holes, i.e., unknown knowns. In the case study, such outflanking and disintermediating patterns were driven by radical consumer value as the new type of innovation (Baldwin & von Hippel 2011).

The systemic big picture also serves the ultimate goal and direction setting. Sometimes management guides implicitly follow Chandler’s observation that emergent technology companies create new strategies and structures which are followed and imitated by others with a delay, e.g., James’ (1996) paragon was “the electronic elite” and Venkatraman’s (2017) exemplars were “the digital giants”. System-theoretically, this is about equifinality, i.e., that the same final state is reached from different initial conditions and in different ways (von Bertalanffy 1969:40). But role models may be spotted neither by studying incumbents nor rising stars, instead, they may require to find and watch the still unknown and nascent periphery outside the known boundaries. In addition, as Rosenzweig (2007) described, idol companies can be short-lived fashions thriving in a specific temporary context.

The case classified thrusts into proactive vis-à-vis reactive. The kite strategy map developed and used in the Business Transformation multi-client study (1996) used Ansoff’s five-level thrust categories stable, reactive, anticipative, explorative and creative. This required a separate “thrustmeter” with the time on the x-axis and the levels of thrust on the y-axis. Industries, corporations and businesses are exposed to varying environmental thrusts. A thrustmeter can detect and compare passivity and activity levels between peers. The case showed a decrease in the level of thrust from the 1990s to the 2000s. Examples of creativity are “moonshot” and “zero to one” projects. The thrust and commitment of Amazon in order to create dominance was described in Bezos’ interview (Business 2.0, April 1999:68) referred in Chapter 3.4 when he told in advance what is going to happen in the next 20 years.

As a summary, the system concept has a lot to offer for a mid-range theory on digital transformation. The inheritance property reveals patterns of unknown knowns, such as outflanking competition or radical customer value as the new sources of innovation, i.e., they exist even if they have not been detected yet. Concerning generalization and extrapolation, a system view evades complacency and leaving out powerful patterns. Observability by datafication first in media and communications was the basis for new and winning business models. IoT as a new source of data expands metering to new domains and beyond a few dots such as KPIs to a bigger amount of detailed datapoints which allow “low-range” hypotheses. Equifinality is realized by adopting goals from lead or nascent companies. Thrust measures and compares passivity and activity levels between industries, corporations and businesses.

**Contribution #9: Coherence with bracketing.** Coherence is defined as a dynamic fit or sync with right-timing and mutual amplification, e.g., like the interference or addition of wave functions, such as laser or spin coherence as the right-timed alignment. Another metaphor is gravity assistance where big objects accelerate or redirect small probes by giving them energy, like a slingshot, in business context, for startups.
In addition to zooming in and out, *bracketing* is a photographic concept of taking several shots of the same complex subject with different settings. Multiple shots can be mixed to capture both details and the whole, also breaking the linear uniform time. Bracketing for coherence means shots that pick up and organize selected patterns to the same picture for analysis, i.e., some paths (in the circle), routes (in the square) and trajectories (in the kite) from Figure 6-2.

Coherence between the triangulated frameworks and their shared business, technology or regulatory environment updates classic strategy, contingency theories and open system thinking. Certain strategies, structures and systems thrive in certain environments and vice versa the adaptations to these conditions revise strategies, structures and systems. Coherence ties up Contribution #6 as the shaping dynamics of fractal strategies and structures sensitive to the environment; Contribution #7 as getting things done by mapping, casting and integrating 360-degree insight into execution paths; and Contribution #8 as the inheritance of system properties, e.g., using the system-theoretical epistemology to search for data and patterns.

The literature review of my research reveals that there is an old rich literature on open systems, environments – e.g., Ansoff’s Environment Serving Organization (ESO) – and contingency theories. Is it possible that the fading of explicit system thinking has led to project recent trends and phenomena *ad infinitum*? Context and environment with structural and dynamic characteristics are key issues for coherence and need to be included in the mid-range theory for digital transformation. To restate the example in the case, the old context (data) became the new core and the old core (voice) was downgraded to context in 2007.

As a summary, patterns – paths (in the circle), routes (in the square) and trajectories (in the kite) – need to be coherent between each other and with their environment which can be reimagined as the fourth and outermost layer to the triangulated frameworks. Bracketing is the technique to analyze pattern coherence.

The case-based enhancements and enrichments to the triangulated frameworks listed above are building blocks for a mid-range theory on digital transformation together with hypothesized research needs and opportunities for new contexts.

### 6.3.3 Reframing the theoretical foundation

Referring to strategic and managerial lenses, and Normann’s (2001) reframing where “map defines the landscape”, the theories and frameworks in use impact how empirical observations are interpreted. The theoretical foundation expressed as first principles – also known as axioms or postulates – is assumed to exist before the reasoning process. The first principles constitute the a priori truths but some conclusions can be made on them based on their operationalization and the case study.

As hypernyms, strategy, structure and system match the three “hard” Ss in McKinsey’s 7S framework attributed to Tom Peters (2001, Kiechel 2010) in the late 1970s and documented in Pascale & Athos (1981). The 7S framework gives the primacy to the four cultural and “soft” Ss of staff, skills, style and superimposed goals which Peters attributed to Douglas McGregor’s (1960/2006) human-centric Theory Y.

My thesis operationalizes the hypernyms of strategy, structure and system in an expanding way. But the case study does not delve into the in-depth cognition, behavior and decision-making and the related stream of academic literature since the 1960s. Notwithstanding this,
the operationalization of the hard 3S framework can take notice of the soft 4Ss both through the leadership dimension of the kite and through the transformation cycle circle, analogously to, e.g., the cognitive shifts required in leading ecosystems (Moore 1996:159) and the attention Wang & Li (2018) paid to the culture in their Chinese social systems engineering framework.

The business histories referred in my thesis – not only on Nokia but on some of its peers as well – tend to approach their subject with the primacy of the soft 4S lens. This raises a topic for further research: Is there a general soft 4S bias in management and business literature? And further, is it possible that strategies, structures and systems are generally underrated and underrepresented? The 7S book (Pascale & Athos 1981) was titled The Art of Japanese Management but geopolitically and regionally value has migrated towards the U.S. and China – a Kuhnian anomaly as a violation of the expectation induced by the soft 4S paradigm. Is the soft 4S a myopic lens, a map missing contours, restricting thinking inside the existing to the detriment of the expanding hard 3S box? Conceiving the hard 3S as a paradigm, it is a different way to see (Kuhn 1970:52-53) with a wider scenery. The channel matrix in Mäkelin & Vepsäläinen (1989) was actually the structure matrix of social organization: technology, i.e., soft: hard, man: machine, and touch: tech. During the last thirty years, technology has captured tasks from men, as well as created and destroyed tasks, and shifted the boundary and division of labor between the soft and the hard.

### 6.4 Managerial implications

My role as the reflective practitioner (Schön 1984), the boundary spanning agenda (Klein & Rowe 2008) and the operationalization focus of the research aim at narrowing eventual gaps between scientific and practical management and their respective communities of practice. This means that the managerial perspective is not a separate add-on but that the above building blocks for a mid-range theory straightforwardly translate into managerial implications and entail contextualization because “past performance is not necessarily indicative of future results”. Here these building blocks are discussed from a practical point of view, overlapping the above discussion but now with a highlight on actual and concrete issues.

The future depicted as Internet of Everything during The Roaring Twenties assumes that new structures and strategies intensify competitive and complementary dynamics in literally everything. This requires the generalization of the results to “things that matter” beyond media and communications, i.e., addressing the whole PESTE(L) and Maslow superstacks, including the retail and finance complex; the traffic, housing, hospitality and energy complex; and the health complex. The future of work beyond Talent Supply Chain Management (TSCM) is also a topic. Insighting and strategizing these complexes is a huge, never-ending and relentless mission. The prospective applications and services are neither consumer-only nor pure B2B but require an added stakeholder perspective. Developing and implementing strategies, structures and systems should integrate research and action in real-time to support and guide decisionmaking, managing and action.

### 6.4.1 Practical interpretations

All recommendations here aim at one single objective: to construct, maintain and manage a dynamic and living model of the business, corporation, industry, market and ecosystem,
measures included. And if not literally a model, at least a better and gradually improving understanding of the diverse sides of the dynamics. A common factor in the following recommendations is the awareness of the environment through strategic era analysis instead of extrapolating the past.

**On the shaping dynamics and patterns of fractal strategies and structures sensitive to environment.** The strategy : structure matrix is a framework for shaping scenarios. Complex *geben* hybrid solutions – Online to Offline and vice versa (O2O) together with Cyber-Physical Systems (CPS) – lead to intricate tensional competing and complementary moves and portfolios, giving incumbents more time to adapt, and slowing down the diffusion of innovations. Diverse movements in the matrix go forward and backward, along the axes and diagonally, being additive close to core or outflanking. Visually, this leads to a rainbow-colored ball pit, schematically resembling the service : channel matrices since late 1980s (Mäkelin & Vepsäläinen 1989). Back then, the team I worked in prepared workbooks to guide the building and analysis of service and channel strategies by these matrices. From a practical point of view, a strategy : structure analysis can be a standalone exercise or the last phase of the insighting as a summary of and a continuation to more detailed analyses.

As a summary: do scenario analysis in the strategy: structure matrix with O2O and CPS included and don’t give up to simple obvious patterns, and be aware of the environment and strategic era instead of just extrapolating the past.

**On getting things done by mapping, casting and integrating 360-degree insight into execution paths in the circle.** This means a holistic, formalized and prescriptive process view, like designing as “deciding who does what, when”. The process of mapping, casting and integrating requires tools for all quadrants and layers of the circle. The resulting Gearshift Knob diagram combines planning and management paths with agile (how), lean (what) and design (why) paths for operational and strategic experiments.

There are hundreds of tools, some possibly fads, listed in handbooks and, e.g., by Davenport & Prusak (2003:215-216). In the development process of the frameworks of this research, years of my consultancy career went by opening discussions with customers by showing early versions of the transformation cycle circle filled with icons and abbreviations for specific tools. The questions were: what tools do you use, where are your strengths and weaknesses, current pain points, gaps and holes, and future needs.

The Internet was a known unknown for the mobile industry because the new frameworks introduced since the mid-1990s were long undervalued, misunderstood or resisted. I sometimes saw how firms or at least managers externalized their insighting for marque market research and consultancy firms. People made “reputation bets” possibly believing that “nobody ever got fired for trusting NN”. They might complain that something was promised – e.g., a certain market growth or a breakthrough – but it didn’t happen. Correspondingly, the Chinese social systems engineering book (Wang & Li 2018:499-576) described and analyzed prestigious think tank organizations. The case and the broader history suggest that the ultimate responsibility for insighting and strategizing should not be outsourced to management fashion factories and shops. Similar conclusions can be found in startup literature which shuns consultants when doing something creative, i.e., a “moonshot” or a “zero to one”. A responsible company is responsible for its future, i.e., for insighting and strategizing. Unlike Frederick Taylor’s one best way, there is no one and only route, path or trajectory.
Tau is a measure borrowed from system dynamics for the time needed to get something changed or done. Tau as the rhythm of renewal is set by leading or invading companies. This was a big issue at mobile world congresses when “old fast guys became new slow guys”. There are swarms of loops with preset Taus and gebunden hybrid solutions come with vastly differing Taus. E.g., a standard automotive industry hardware product life cycle can be seven years with a mid-life facelift (Radtke et al. 2004) whereas apps are updated on-demand or monthly over-the-air. The slowness may give an edge to incumbents but on the other hand incumbents are used to be slow. Tau swarm management means the identification and governance of diverse loops.

As a summary: build a 360-degree model of paths with tools, look for rising frameworks so far unknown to “establishment” and beware of “reputation bets”, be aware of the responsibility for fourth generation insighting, make an inventory of tools in-use with eventual gaps, and learn the swarm of Taus, i.e., the rhythms and how long does it take to do something. And make sense of the strategic era and possible changes in the environment.

**On the inheritance of system properties**, i.e., incumbents, invaders and ecosystems reimagined as systems. System thinking evades complacency and leaving out powerful transformational thrusts. It helps to detect gaps and holes, things that are known to exist but have not been detected and measured yet, both at micro-level (what) and in the bigger picture of strategic (why) patterns and goals.

Since the 1990s, many companies have invested in knowing their customers individually which has created a thriving Customer Relationship Management (CRM) industry. Digital and physical transactions and interactions are tracked and incentivized with scorecards or at least by Net Promoter Score (NPS) assessments, i.e., by asking whether the customer would recommend the service. Customer data even in a small country can contain, e.g., one hundred million inbound plus outbound events in a year. Sometimes the genuine customer feedback is made public (by opt-in, i.e., asking the customer allowance) for all Internet users to motivate employees. Operational customer processes are streamlined by lean methods (what). This spreads a useful “same by better” attitude but should not blind from strategic (why) insighting and experiments. Thrustmeter is a simple future-oriented measure of patterns that might complement the reactive NPS in measuring whether “we try harder”.

A common pattern in past digitalization has been the radical consumer value through lower costs and more opportunities, i.e., 2xfree. This outflanking pattern was often based on disintermediation. The always-on and ubiquitous Online to Offline (O2O) and Cyber-Physical Systems (CPS) increase the amount of data but they may bring along more stakeholders as intermediaries. Ambitious implementation projects are sold to complex B2B networks of, e.g., homebuilders, property managers, landlords, hotel and rental cars companies, nursing homes and hospitals, and cities. The improving observability of systems has the potential to create data on people and their daily life, eventually leading from process reengineering to what Wang & Li (2018) called social systems engineering. E.g., retail and financial transactions, traffic behavior and real-time electricity and health data transilluminate individual people and families. All this elevates regulation and cyber security as its enforcement from context to focal points in strategic era analysis, eventually to a new core.

As a summary, new sources of data enable new metrics with “low-range” hypotheses, and system thinking helps to reveal unknown known patterns and goals. A thrustmeter might complement reactive NPS as a future-oriented measure of trying harder. Combined data beyond single processes shifts reengineering toward social system engineering which
emphasizes regulation and cyber security. This requires awareness of the environment and eventual changes in the strategic era.

**On the coherence with bracketing.** Coherence means a dynamic fit or sync with right-timing and mutual amplification between patterns. Patterns – paths (in the circle), routes (in the square) and trajectories (in the kite) – need to be coherent between each other and with their environment. Bracketing as a photographic technique takes several shots of the same subject with different settings, such as time and depth. Multiple shots can be mixed to capture both selected details and the whole.

A management book (Slywotzky et al. 1999, referred in Chapter 3.2.1) used Picasso’s paintings as examples and the metaphor for making sense of complex “things”: look at and understand the era, i.e., the context, and zoom out and in to get the pattern. Bracketing is a similar analytic and synthetic technique of changing and mixing lenses.

As a context, the anthropogenic climate change (ACC) narrative with related politics and regulation – “P” and “L” in PESTEL – has accelerated electric vehicle (EV), solar, wind and storage industries with the potential to transform and liberate housing, traffic and urbanization and to transform them from hardware-only toward more software-centric businesses, distributing production, consumption and innovation over data and artificial intelligence platforms. The ACC narrative has been driven by geopolitics, technology acceleration and the promise of nascent radical customer value toward “zero marginal cost society”. This still latent proposition expands the customer value from two to three times free (3xfree): near-zero marginal costs and freedom of opportunities as before, but next also free of emissions as an additive third value component. This realizes itself in traffic and in recombining, distributing and arbitraging traffic and housing energy systems with externalities to urbanization. Maybe this context has the potential to become a new core for some industries. The lesson learned from the case, as well as from the broader history of digitalization, is that thriving strategies and structures must deliver radical consumer value thus regulation should not try to escape this requirement.

Contextual factors include lavish and risky venture capital and incumbent investments for the next cycle of digitalization, especially for EVs and perception and autonomous artificial intelligence (AI) in the U.S. and China but also in Germany. Eventual commercial delays in Online To Offline (O2O) and Cyber-Physical Systems (CPS) technologies or AI software – a new “AI winter” – would slow down innovation.

As a summary, bracketing is technique of mixing and matching details with the whole and the context to assess coherence. Concerning the systemic environment and changes in the strategic era, the ACC narrative is a political and regulatory cross-industry issue and initiative to accelerate technology with a still latent proposition of new radical consumer value. Again, awareness of the environment is needed because of eventual changes in the strategic era instead of just extrapolating the past.

The above managerial implications are all about constructing, maintaining and managing a dynamic and living model of the business, corporation, industry, market and ecosystem, measures included. Managers and strategists can play with the triangulated frameworks to find patterns – paths, routes and trajectories as opportunities and threats – for their businesses in the 2020s. In addition, the following short list of managerial implications should be considered.

**Implication #1: Platform giants as threats and opportunities.** The mobile industry alone was unable to make their 3G and 4G networks to thrive with the cornucopia of
new consumer “things”. External global structures played an enabling role for ecosystems, including very large platform firms, near-monopoly “superstars” growing by scale, network and feedback effects (Mayer-Schönberger & Ramge 2017). The emergence of giants was predicted by Morgan Stanley (Meeker & DePuy 1996) but the Internet also unleashed small teams – inside firms in flat organizations and outside on the markets – to deliver, accelerating entrepreneurship, markets and ecosystems to the detriment of hierarchies. Now and next, giants are addressing IoT platforms and ecosystems.

A practical implication from the research to managers and strategists in all industries – including those not yet seriously touched by digital transformation and still in the digitization phase – is to experiment with the triangulated frameworks to find patterns – optional or threatening paths, routes and trajectories – for their businesses. This means not to be content with the necessary process incrementalism of “same but better”.

**Implication #2: Expanding and operationalization of specific management and strategic frameworks, e.g., blue ocean.** The frameworks can expand and operationalize some specific management and strategic frameworks from the analog and early digitalization eras. For example, Blue Ocean Strategy has been ranked as one of the most influential and bestselling books on strategy where Kim & Mauborgne (2005) proposed the strategic move – neither the industry nor the company – as the basic unit of analysis, with the simultaneous pursuit of new value and lower cost. Moves were essential also for Biddle’s (2005) military theory and for Venkatraman’s digitalization (2017). The alignment matrix operationalizes the blue ocean so that the moves are patterns of paths, routes and trajectories.

**Implication #3: The challenge to corporate and industry transformation with the potential comeback of corporate innovation.** The case study describes how industry and corporate strategies and structures surrendered to ecosystems and platforms, originally predicted by early writers in the mid-1990s. Many such startups and adjacents failed in the dotcom crash but some succeeded in the 2010s. Combinatorial and fusion innovations blur and redraw established industry boundaries. The threat of marginalization posits challenges for corporate innovation and institutional entrepreneurship, highlighting the role of insighting with patterns of paths, routes and trajectories.

Schumpeter changed his mind concerning the role of entrepreneurship vis-à-vis planning and corporate innovation when he predicted that corporate planning will overcome. It is not unthinkable that – at least in some cases – the future innovation slows down, becomes more additive or even reverses to vertical pipes because of massive gebunden hardware, analog and people elements.

**Implication #4: The telecommunication industry’s pursuit for growth.** The telecommunication industry has suffered from the lack of growth and waits for 5G as the new driver. Before this, the service provider industry is positioned as “value stocks” and “safe haven” in turmoil. The future of the industry has been discussed not only at mobile world congresses (MWC) but in management books with recommendations for both additive close to core and outflanking customer initiatives, e.g., Willetts (2012), Meffert & Meffert (2017:136-143), Meyer (2017:182-190) and Venkatraman (2017:132-133).

In 2018, one of the iconic companies at MWCs, Softbank, divested its slow-growing Japanese and U.S. telecommunication businesses by an IPO (Initial Public Offering in Japan) and a merger (Sprint with T-Mobile in the U.S.). Its Capital Market Day presentation (CMD, Softbank 2018) described Softbank’s new strategy as a global orchestrator of innovation networks with leading companies in key transforming industries. This strategic move
contradicts Schumpeter’s conclusion and prediction.\textsuperscript{85} Other examples for the same year: AT&T acquired Time-Warner and Swedish Telia acquired Bonnier’s television business.

Beyond and above the historic connectivity, “C” in ICT, Internet of Everything comes with opportunities embodied in “I” in ICT. Notwithstanding that planning and managing were outsourced from my case study, they are relevant for the 5G where the mobile industry – according to MWCs – wants to accelerate corporate customer innovation and build and run business solutions by B2B strategy, especially for connected products and systems, instead of giving up to adjacents and startups.

\section*{6.4.2 Discussion on the future}

A simple mental arithmetic suggests that the mobile Internet cycle of 2007 might be replaced by a new 12-year cycle starting in 2019, creating The Roaring Twenties metaphorically using and timeshifting the industrial transformation of the 1920s for the digital transformation of the 2020s. Here it is called Internet of Everything because there is no real name for it yet as cycles are detected and named retrospectively. The patterns of this nascent cycle are still stealth and fuzzy which should be seen as a call for studying and watching as they unfold in time.

The case study and history chronicled and analyzed here give a reason to assume that the next cycle of digitalization might come with value migrations similar to earlier cycles and that this is not an option or threat which can or should be defied or circumvented, not only about added value and mere digitization, neither digital maturity nor intensity. It happens and immerses as the Internet is the external structure for “things”, neither a service nor a different industry, they or otherness, nothing to beat but to “join because you can’t beat”, “force not to be fought but used”.

The case study and the history show that when radical innovation extends to big industries, markets and categories of goods, this can be stealth at first, not necessarily discussed at industry conferences (mobile world congress example described here), and there may be no academic publications (Google example described by Levy 2011). Managerial methods tend to address “pain points” as dots in strategy maps but as digital transformation does not cause nausea or aches it may remain unobserved or understated, as unknown known. It can hide in lead markets and get lost in the aggregation of market data, as happened in the mobile industry. It may be difficult to detect on time or it can be considered as a hype people get tired on, or answered with narrow digitization or denialism. A temptation is to extract and monetize added value to increase Average Revenue Per User (ARPU). There may be such opportunities close to core, such as Apple App Store and Amazon Kindle, but one should also look for opportunities or threats which migrate value to customers and partners, to win by shrinking, as has happened many times so far.

Contracting market share and finances are visible lag variables of “\textit{some horrible mistake you have made a couple of years ago}”, as Bill Gates once said (Forbes, Jan. 16, 1995), and continued, that “\textit{by the time your sales goes down, you’re dead, because it’s too late to do anything about it}”. The deceptively quiet post-2000 years concealed the next revolution. Old leaders slept as recommended by strategy dignitaries. Incumbent ICT firms were happy to return money to their shareholders, and as the case shows, many of them downsized R&D

\textsuperscript{85} The CMD presentation depicted Softbank as the modern but non-operational continuum to the past networked Japanese operational and closed zaibatsu and keiretsus.
and they did not innovate as executives admitted at MWCs. They trusted in “same but better”. They underestimated consumer startups and adjacents, as explained by IBM’s CEO Ginni Rometty (Feb. 26, 2015; Bort 2015). This new consumerization has nothing to do with the literal consuming, spoiling or wasting, it is not a passive opposite to the active producer or prosumer, it is not only a user experience, it means value migration to people, with new strategies and structures. The common success factor in the three cycles PC (1983), Internet (1995) and mobile Internet (2007) was radical customer value as lower costs and new opportunities, i.e., two times free (2xfree). Freedom was also a key topic in the Macintosh launch – “1984 is not ’1984’” – although the discourse on surveillance during the late 2010s may resemble ‘1984’. It can be assumed that The Roaring Twenties also comes with radical customer value with some new freedom. Or maybe the tension and fight between freedom vis-à-vis surveillance and control resembles that described by Benkler (2006) and Zittrain (2006) in the media and communications domains.

Machine communication (Machine To Machine, M2M) was hyped at MWC 2001 but it became a commercial disappointment because market research was far too early in its breakthrough estimates. M2M later expanded to Internet of Things (IoT) defined as a system-level extension to M2M, making a difference to the Internet of connecting people, for example, by the mobile industry (GSMA 2014: “The use of intelligently connected devices and systems to leverage data gathered by embedded sensors and actuators in machines and other physical objects”), and by McKinsey (2015) whose study analyzed IoT in nine settings – human, home, retail environment, office, factory, worksite, vehicles, city, outside –, i.e., gebunden to places or physical contexts.

Internet of Everything (IoE) means that if something can be digitalized, this will be done. The most important “things” from a consumer’s point of view are housing and traffic (energy included), and retail (finance included), jointly with an over 70 % share of wallet, from a society’s point of view health with an 8 % to 18 % share of GDP in industrial nations, and from a B2B point of view Industrial Internet (Bouée & Schaible 2015). Referring to Perez (2002), this looks like “the golden age” of the digitalization where value disperses from technology vendors to customers.

Digitalization as the fusion innovation between ICT and other industries, between virtual and real, has been envisioned by futurists (Nefiodow 1999, Rifkin 2014), by firms (IBM´s Smarter Planet, Cognizant´s Halo, Qualcomm´s Sixth Sense and Alibaba’s New Retail initiatives) and by the mobile industry (GSMA’s Connected Living initiative and Smart Cities, Smart Homes, Smart Retail and m-Health concepts). Smarter and Halo initiatives contain the message that value comes from datafication, “I” in ICT, and business media expects that artificial intelligence applications will be built to utilize expanding raw data. Connectivity initiatives hint that the value still lies in “C” in ICT. Sixth Sense initiative extends the physical five senses to virtual by “T” as sensors and actuators in ICT. The New Retail hybrid concept was launched by Alibaba’s Jack Ma in 2016 to integrate E-Commerce, stores, logistics, data and artificial intelligence (Weinswig 2017).

Despite the earlier consumerization, market studies have estimated that most of Internet of Things (IoT) is about B2B. The history of digitalization justifies to doubt whether a transformation is possible as a B2B phenomenon only without a radical consumer value. What is B2B and what is consumer is fuzzy because of the scoping of the impacts. Industrial Internet, called 4.0 in Germany and Internet Plus in China, is conceived as the enabler of competitiveness, services and business models. Targeting consumers means B2C or C2C,
targeting businesses means B2B or B2E, and social (this does not point to social media here) applications are about G2E, G2B and G2C where E is the employee and G stands for the government. How about B2B2C and G2B2C? Are they consumer or B2B? Major G2B2C2C complexes exist in traffic, energy and health, triggered by the increasing role of “P” and added “L” for Legal in PESTEL. When digitalization transforms society and people’s lives, it expands B2B businesses to G2B2C2C. Internet of Everything trickles down in the hierarchy of needs and collides with existing businesses, regulation and tax footprint, big G and big B, giving it a political context. There is no right level of analysis, the answer to the question “consumers or B2B” is in fractality.

Each cycle of digitalization has ten-folded the number of devices but – as connected devices share connections – the growth of connections does not equal the growth of connected devices. In the case study, this was the topic of a senior executive panel discussion at MWC 2015, July 16: where is the money, who makes money from Internet of Things (IoT) and how? This panel of executives from leading companies rejected connectivity as the future monetization basis of IoT.

According to Bogers et al. (2018), digital technologies and the Internet finally move to the highly regulated sectors of health, energy, transport, or finance: “This is the world ... of sensors, and the world of ‘big data’ ... where bits, atoms, and even cells combine in new and interesting ways.”

To estimate the consumer scale and scope of Internet of Everything, the Maslowian hierarchy of needs can be refined and segmented to strategy maps and “jobs to be done”, with specific discoverable “things” as potential “killer apps”, some of those likely recombinations. Consumer maps can be clustered into segments measured by share of wallet and time budget:86

- Communication and communities, C2C (3.7% of money, 74 minutes a day).
- Media and ads, B2C (4.3%, 194 minutes).
- Cultural production or consumption from entertainment to education, B2B2C, C2C (10.1%, 97 minutes).
- Finance: banking, payments, investment, trading and insurance, B2C, C2C (no data of spend and time used).
- Health: healthcare, wellness, aging, active sports/leisure, B2C, C2C (3.6%, 43 minutes).

Spend analysis reveals three high relevance consumer maps with a combined 72% share of wallet: housing (opex and capex, 29% share of wallet), retail (24%, most of that food), and traffic, travel and tourism (19%). High relevance maps by time usage are media and housing

86Statistics Finland (2002). There are minor differences between statistics due to definitions and – in time-usage studies – due to methods. The numbers are taken on as-is principle from public statistics. The numbers do not add to 100% because it was not possible to classify all of the consumption between the eight processes. This Finnish data has inessential differences to the U.S. data curated by Meeker (2015). The biggest difference is that people in the U.S. pay more and more directly for health.
with chores. There are large differences between sub-populations (for instance, age and gender) and the time of year and the day of week.

In the communications, media and cultural complex, the historic industrial value chains of print, radio, music, telephony, movies and television have gone a long way in their transformation onto the Internet despite that legacy firms may still resist the emerging financial models, freedom of speech, and low barriers of entry. A similar scenario can be re-imagined for traffic and travel (ship, train and tram, car, bus, flight, bike, ..., and hospitality services), for retail (department store, mail order, category killer, chain store, mall, electronic commerce and markets, ...), and for energy in housing and traffic. In the last-mentioned complex, historically separate industrial value chains produce energy for consumers: traffic fuels, district heat and gas in some countries, electric grid, heat pump, roof-top solar. Highly taxed fuels are sold by liter, heat as a service has a fixed kilowatt-hour price, grid electricity can be bought at variable spot and more fixed transfer prices, air source heat pumps have limited and weather dependent capacities with a Coefficient of Performance (COP) between 2 to 5. Solar production is limited, highly variable, with zero marginal costs and, if its output is not used in-house, it can be sold to the grid.

Compared to the communications and media complex as the lead market, the retail and especially traffic and energy complexes are early in their formative processes of shaping new strategies and structures. They also may scale slower than the lead market because of their sensitivity to environment.

One example of potentially decelerating regulation is the so-called gig culture\textsuperscript{87} as a new type of Talent Supply Chain Management (TSCM) where traditional supply chains have been replaced by electronic markets. These are G2B2E2C structures where G stands for the government and E is now the employee. For instance, in some ride-hailing and last-mile delivery cases the workforce has been redefined as employees (Wired, Marshall 2018; Business Insider, Peterson 2018). This argumentation goes that temporary workers require social security, healthcare and guaranteed at least semi-permanent future-proof income. What is good for many people employed in seasonal businesses such as students or those in the hospitality industry, or otherwise need a dynamic work-life fit, may not be good for families responsible for kids and mortgage.

B2B ICT service companies can drift into prisoners in “golden cages”, e.g., Nokia’s former subcontractors. Possible disruptions in client businesses are a dilemma for them if clients remain complacent or even fight against future and progress. The first steps toward digital transformation were doing same but better, i.e., digitization measured by digital maturity and intensity, in, e.g., newspaper editing and publishing systems; digital television and phones; mail-order retail; event, travel and traffic ticketing and different kinds of access control; financial and public services, like “paving the cowpaths”. These steps were followed by digitalization as value-added but still close to core. But building on existing internal structures may cause high production, transaction and opportunity costs, due to time-consuming negotiations, idiosyncratic learning needs, and lost market potential. External new structures empower small teams and challenge B2B Talent Supply Chain Management (TSCM) and project and program management offices (PMO). Consumerization vaporizes

\textsuperscript{87} Internet contains lists of gig job apps or sites, e.g., at the time of writing this, the website https://visual.ly/community/infographics/how/how-earn-money-without-traditional-job-150-apps-and-sites-gig-culture-lists-150-such-apps-or-sites-in-24-categories.
existing competences, work and value. Concerning B2B ICT, the digital transformation exercises should be done with ambition, not only as marketing projects for TSCM and PMO services to big corporate accounts, driven by incentives to sell more routine work and bodies.

With these experiences, the reframed research question to analyze The Roaring Twenties at business/corporate, networking/industry and ecosystem fractals becomes: “How does Internet of Everything change strategies and structures in and across retail and finance; housing, traffic and energy; and health complexes, and work – not only in theoretical terms, but the practical core concepts and methods in discovering jobs to be done, “things” and killer apps?” This means to continue this research with the focus on “things that matter” and the future. It also means the further enhancement and enrichment of the frameworks.
7 Conclusion

The theoretical foundation of my research consists of three cornerstones as first principles: (1) The history of industrialization and corporation as the interplay of strategy and structure with the transformative role of new technology, as chronicled by Chandler, and as its corollary, (2) the expansion of strategies and structures with new options, and (3) the fractal system theory as the operationalization of Schumpeter’s views on dynamics, leadership and nested levels, such as ecosystem, industry, market and corporation.

The initial research question “How does digitalization change strategy and structure – not only in abstract theoretical and general terms, but the practical core concepts and methods?” highlights change as expansion and practicality as operationalization calling for simple, parsimonious and memorable descriptions and explanations to complex phenomena.

My theoretical foundation goes back to first principles, i.e., starting from very basic propositions, as such obvious, almost trivial, but what matters here is their methodological interpretation. This represents a managerial approach expressed by triangulated fractal frameworks with dynamic patterns; the transformation cycle with paths for getting things done from insight into execution, the strategy : structure alignment matrix with shaping routes, and the system-theoretical kite strategy map with trajectories as thrusts, moves, eras and possible turns.

Concerning strategy and structure, my research links the new, extensive and emerging research on ecosystems, architectures, platforms and boundary resources (e.g., Tilson et al. 2010, Yoo et al. 2010, 2012; Ghazawneh & Henfridsson 2013, Eaton et al. 2015) to the history of corporate, network and industry strategies and structures. A parallel and an overlapping stream of new research literature (e.g., Henfridsson & Yoo 2014, Dattée et al. 2018) addresses the gaps between distributed digitalization and ICT management, also including iterative design (why), lean (what) and agile (how) methodologies different to classic linear planning and managing. The case study of my research – using the transformation cycle – confirmed the importance of these new types of development processes.

I have used extensively system theory both in the development of my framework and in the case study. Part of the new research also uses or proposes the use of system theory to bring “system back to ecosystem” (Dattée et al. 2018).

While my frameworks link past and new research streams on strategies, structures and systems, they are not intended to constitute any new “grand” theory but to present an integrative trend in research and methods. The frameworks are used and tested in a retrospective case study from mobile communications to mobile Internet ecosystem at global industry, local market (Finland) and lead company (Nokia) levels. The qualitative research process is theory-driven thematic analysis where the theory now denotes the triangulated constructed frameworks.

The case study iterates fractally so that the global mobile industry analysis is deepened with the analyses of the local lead market, the global ICT industry and Nokia as the then-lead company. In this limited but – assessed by market valuations, business revenues, customer value, geopolitics and regionalism – important top-down case, globally but especially for Finland, the frameworks are employed to explain the mobile transformation from an industry to an ecosystem. This is followed by a validity evaluation which includes the recognition of contextual dependencies.
The case study is used to enhance and enrich the frameworks. These enhancements and enrichments are abstracted building blocks for a mid-range theory on digital transformation together with hypothesized research needs and opportunities. They consist of shaping scenarios for evolving fractal strategies and structures; mapping, casting and integrating 360-degree insight into execution paths for getting things done; inheriting system properties especially to detect unknown knowns; and exploring the coherence of dynamic patterns by bracketing.

Concerning coherence, the bracketed dynamic patterns were conditioned by the context of the early drivers of digitalization, i.e., communications and media. Strategic era analysis has to elevate context as a business factor in itself. A reasonable assumption is that that the new contexts of digital transformation are more gebunden than the earlier ones, and there are multiple stakeholders such as businesses and regulators. This scenario will complicate the paths from insight into execution and lead to intricate competing and complementary dynamic patterns of strategies, structures and systems, accelerated or decelerated by regulation.
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Digital transformation as expanding strategy and structure

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