

Department of Information and Service Economy

Gamification

Motivations & Effects

Juho Hamari



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Gamification: Motivations & Effects

Publisher School of Business**Unit** Department of Information and Service Economy**Series** Aalto University publication series DOCTORAL DISSERTATIONS 11/2015**Field of research** Information Systems Science**Date of the defence** 6 February 2015 **Monograph** **Article dissertation** **Essay dissertation****Abstract**

The field of information systems has a sustained tradition of dividing systems into either utilitarian or hedonic systems, with the core idea that some systems are purely utilitarian in nature and some are self-purposeful. However, in recent years, information system design has been increasingly used for motivational purposes, that is, a hedonic or motivational system design is employed as a method for increasing the utility of systems and activities. Simply put, the core idea is that the more enjoyable or motivating a system or activity becomes, it can also become more utilitarian since the user is expected to be more willing to increase the amount and quality of related activities.

The most popular conceptual development in this area has sparked wide-ranging interest towards this phenomenon, and has adopted the name 'GAMIFICATION'. This multi-disciplinary term arises from the general conception that game design, if anything, is an art of hedonic system design, since games are one of the pinnacle forms of self-purposeful systems. In other words, self-purposeful systems such as games are thought to be used for the sole purpose of non-utilitarian enjoyment that is derived from the actual use of the system, rather than from any concrete outcomes of that use. Therefore, the term gamification can be read as 'a process of making systems/activities more enjoyable and motivating, in order to support the utilitarian or otherwise beneficial outcomes of the system, service or activity.

Although the idea of gamification has been enormously popular over the last couple years, there has remained a dearth of conceptually refined understanding of the phenomenon, as well as a gap in the empirical evidence offered to demonstrate its effectiveness. With these paucities in mind, this dissertation aims to address both the conceptual and empirical gap. From the conceptual perspective, this dissertation presents two studies in which gamification is linked to IS/marketing theory. The first study links marketing literature with observations drawn from actual games on how game developers use game mechanics in their services as means of marketing (Study 1 - Game design as marketing: How game mechanics create demand for virtual goods). The second conceptual study forms a definition of gamification, arrived at by triangulating theories taken from game studies, motivational psychology, service marketing and IS/HCI (Defining Gamification - A Service Marketing Perspective). To investigate the empirical gap, this dissertation presents two studies. The first empirical study investigates what (social) benefits and motivations drive the continued use of gamification services (Social motivations to use gamification: an empirical study of gamifying exercise). The second empirical study presents a 1.5 year long field experiment on the effects of gamification on user activity and retention (Transforming Homo Economicus into Homo Ludens: A Field Experiment on Gamification in a Utilitarian Peer-To-Peer Trading Service).

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List of Publications

This doctoral dissertation consists of a summary and of the following publications which are referred to in the text by their numerals

- 1.** Hamari, J., & Lehdonvirta, V. (2010). Game design as marketing: How game mechanics create demand for virtual goods. *International Journal of Business Science & Applied Management*, 5 (1), 14-29. ISSN 1753-0296.
- 2.** Huotari, K., & Hamari, J. (2012). Defining Gamification - A Service Marketing Perspective. In *Proceedings of the 16th International Academic Mindtrek Conference*, Tampere, Finland, October 3-5, 2012. Association for Computing Machinery (ACM). 17-22. ISBN 978-1-4503-1637-8. DOI 10.1145/2393132.2393137.
- 3.** Hamari, J., & Koivisto, J. (2013). Social motivations to use gamification: an empirical study of gamifying exercise. In *Proceedings of the 21st European Conference on Information Systems*, Utrecht, Netherlands, June 5-8, 2013. Association for Information Systems (AIS). ISBN 978-90-393-6112-2.
- 4.** Hamari, J. (2013). Transforming Homo Economicus into Homo Ludens: A Field Experiment on Gamification in a Utilitarian Peer-To-Peer Trading Service. *Electronic Commerce Research and Applications*, 12 (4), 236-245. ISSN 1567-4223. DOI 10.1016/j.elerap.2013.01.004.

Part I: Summary

1. Introduction

The information systems field has a tradition of dividing information systems into either utilitarian or hedonic systems - that is, into systems that are purely utilitarian in nature and those that are self-purposeful. However, during recent years, information system design has been increasingly harnessed for motivating people into a variety of individually and collectively beneficial behaviours. In other words, hedonic system design is employed as a method for increasing the utility of systems and activities. These kinds of systems represent an interesting mixture of both sides of the continuum. Simply put, the core idea behind this development is that the more enjoyable or motivating a system or an activity becomes, the more utilitarian it may also become as the user becomes more engaged with the system and the core activity. In this area, the most popular conceptual development has adopted the name 'GAMIFICATION' (Hamari & Lehdonvirta, 2010; Deterding et al., 2011; McGonigal 2011; Huotari & Hamari, 2012; Hamari 2013; Hamari et al. 2014a).

Gamification can also be seen as a part of a larger phenomenon where the boundary between games and other systems and services has become increasingly blurred. However, this development can be seen to be bi-directional. On one hand, within games, users are increasingly subjected to decision making situations pertaining to outside-game concerns (e.g. how they use money in Free-to-Play games) (Hamari & Lehdonvirta, 2010, Hamari & Järvinen, 2011; Mäntymäki & Salo 2013; Paavilainen et al. 2013; Alha et al. 2014). On the other hand, in non-game contexts, game design is being increasingly used to redirect people's motivations towards intrinsic, gameful and "fun" experiences (Deterding et al. 2011, McGonigal, 2011, Zichermann & Cunningham, 2011, Huotari & Hamari, 2012; Hamari et al. 2014a). This latter development of enhancing services with the aim of invoking 'gameful' experiences and motivations has been dubbed as 'gamification' (Huotari & Hamari 2012). This multi-disciplinary term arises from the general conception that game design, if anything, is an art of hedonic system design, since games are one of the pinnacle forms of self-purposeful systems. Traditionally, these self-purposeful systems are used for the sole, non-utilitarian purpose of enjoyment that is derived from the process of using the system, rather than from any exogenous outcomes of that use. Therefore, the term gamification can be articulated as *a process of making systems/activities more self-purposeful in order to support the utilitarian or otherwise beneficial outcomes of those systems, services or activities.*

Gamification has already been applied in several areas, including the promotion of greener energy consumption (Nissan Leaf), building loyalty towards TV channels (GetGlue), taking care of one’s health (Fitocracy) and even for gamifying the tracking of one’s aspirations in life (Mindbloom). In popular discussion, gamification has been touted as a next generation method for marketing and customer engagement (e.g. Zichermann & Cunningham, 2011). Predictions about the diffusion of gamification have varied from extremely positive outlooks to (e.g. Gartner 2011; IEEE 2014 – Most organizations will adopt gamification in the near future), to less optimistic ones (Gartner 2012 – most adoptions will fail). Therefore, the discussion around gamification is still divergent. The strong positive beliefs in the effectiveness of gamification have mainly been based on the conception that because games are "fun" and intrinsically motivating, any service that uses the same mechanics should also prove to be ‘fun’, and thus effective in invoking further positive behavioural outcomes. It is clear that gamification has attracted significant interest and a wide range of opinions, however, at the same time there still remains a scant conceptual understanding of gamification (see Hamari et al. 2014a; Hamari et al. 2014b). Moreover, understanding whether gamification lives up to the optimistic predictions about its effectiveness is a pertinent practical issue. However, there is a dearth of empirical studies which investigate those effects which result from gamification (see e.g. Hamari et al. 2014c).

The popular and practitioner interest in gamification is also reflected in an academic context: the number of studies published on gamification is continually growing (Figure 1). The rapid increase in the number of appearances of the word “gamification” in titles, keywords and abstracts of papers indexed in scholarly databases such as Scopus suggests that gamification is becoming a surprisingly popular subject for academic inquiry (for example, when compared to the established concept of persuasive technology which gamification has already surpassed in search hits in one year - see Figure 1).

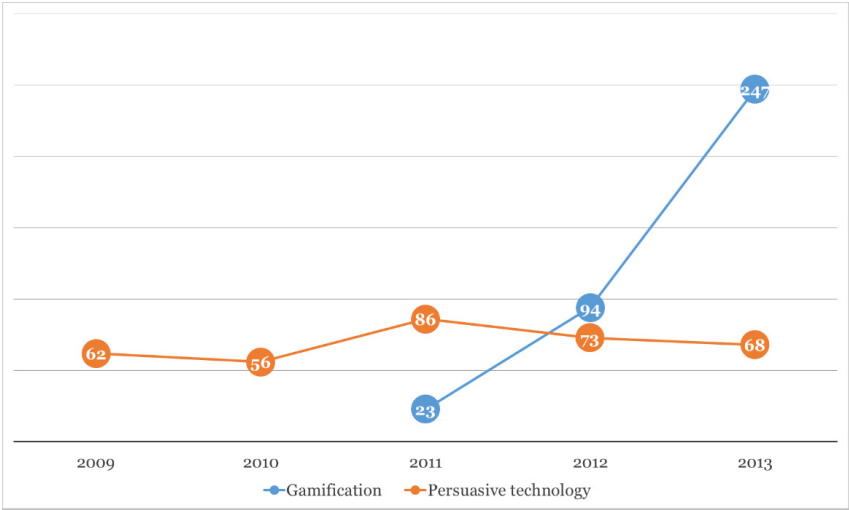


Figure 1. Search hits by year for the search word gamification in Scopus (search hits for persuasive technology for comparison)

1.1 Objectives and research questions

As described above, the idea of gamification has proved to be highly attractive over the last couple years, however, a dearth of research on the topic still exists. With these paucities of research in mind, this dissertation aims to address both the conceptual and empirical gaps of the field. Therefore, the research problem in this dissertation is two-fold: conceptual and empirical. Conceptually, the dissertation investigates the precursors of gamification by examining how game developers have employed game design as a part of their marketing strategy as well as forms a definition for gamification. Empirically, the dissertation investigates the effects of gamification on user activity as well as how social aspects predict continued use intentions towards gamification.

Accordingly, the thesis can be divided into the following research questions:

Defining and conceptualizing gamification:

- RQ1 (study 1): How do game developers and publishers employ game design as part of their marketing efforts?
- RQ2 (study 2): How can gamification be conceptualized and defined (from the perspective of service marketing)?

Continued use of gamification services:

- RQ3 (study 3): How social factors predict continued use of gamification services?

The effects of gamification:

- RQ4 (study 4): Does gamification (in the form of badges) increase a) productive use b) quality of use, c) social interaction, d) usage activity within a service?

As the research articles presented as a part of this dissertation are independent studies, they do not directly or cohesively address the exact same research questions. Furthermore, the studies presented in this dissertation represent different perspectives in the areas of IS, games and gamification. Additionally, the empirical works in this dissertation (or in the research in general) cannot be regarded as comprehensively addressing an entire empirical problem area. However, the empirical studies included address some degree of the lack of empirical evidence on aspects of gamification / motivational IS.

1.2 Structure of the dissertation

The dissertation consists of two parts. The first presents an overview and summary of the theoretical grounds, methods, results and discussions of the different studies which comprise the published research offered for this dissertation. The second part consists of the individual studies themselves.

2. Positioning gamification

This section provides a background for gamification. Definitions for gamification are provided from the past literature (based on an original article of this dissertation). Secondly, gamification is introduced and positioned in the concepts and existing vein of literature in the information systems discipline. Furthermore, gamification is contrasted with other parallel conceptual developments that share some similarities with gamification, but also have significant differences.

2.1 Defining gamification

Thus far, gamification has been defined in two main ways in peer-reviewed literature:

- 1) The use of game elements in non-game contexts (Deterding et al., 2011).
- 2) A process of providing affordances for gameful experiences which support the customers' overall value creation (Huotari & Hamari, 2012 - Study 2).

In defining gamification, Huotari & Hamari (2012) highlight the role of gamification in invoking similar psychological experiences as games generally do. Deterding et al. (2011), on the other hand, emphasize that gamification is directly about implementing 'game elements' into non-game contexts. The main way in which these definitions differ from each other is the point where the 'gamefulness' manifests. Whereas Deterding et al. (2011) propose that the gamefulness is situated in the system design, Huotari & Hamari (2012) state that the gamefulness emerges from the psychological consequences which derive from using the gamified system. The definitions also differ in their articulations of the goals of gamification. Whereas Deterding et al. (2011) do not explicitly state the goal of gamification, Huotari & Hamari (2012) imply that gamification seeks to invoke further benefits from gamification, in the form of changes in the psychological states and behaviour of the users. The conceptualization by Huotari & Hamari (2012) is rooted in service dominant logic (Vargo & Lusch, 2004), which suggests that customers are the creators of value and the company can merely provide affordances for them to experience 'gamefulness'. This conceptualization of gamification implicitly states that it is in the manifold interactions between the system and the user that determines whether they are engaged in gameful experiences, and whether consequently the perceived value of the service is increased.

Table 1. Common psychological factors linked to games

Factor	Definition	Sources
Autonomy / Voluntariness	a sense that the activity is taken up by the actor herself and is free of outside pressures	Avedon & Sutton-Smith 1971; Caillois 1961; Crawford 1984; Huizinga 1944; Juul 2003; Salen & Zimmerman 2004; Suits 1978; Ryan et al. 2006
Flow	an optimal experience characterized as a state of being fully focused and engaged in an activity	Csikszentmihályi 1990
Suspense / uncertain outcomes that are dependent on the actions of the actor	a positive sense of uncertainty of the outcomes (that promotes the sense of agency of the actors)	Caillois 1961; Juul 2003
Relatedness	a sense of belonging, being connected with other people	Huizinga 1944; Ryan et al. 2006; Hamari & Tuunanen 2014; Yee 2006
Immersion	a feeling of being submerged/absorbed/engaged (in a virtual/game reality)	Ryan et al. 2006; Hamari & Tuunanen 2014; Yee 2006
Competence / mastery / achievement	a sense of achieving, being competent	Ryan et al. 2006; Hamari & Tuunanen 2014; Yee 2006
Playfulness	an exploratory curious attitude toward a task	Huizinga 1944; Webster & Martocchio 1992

Regardless of whether the definition ultimately emphasises affordances or psychological experiences as forming the crux of ‘gamefulness’, the vagueness as to what games and/or ‘gamefulness’ ultimately are, remains dependent on the definitions of games and the psychological factors which are linked to them. There does not seem to be a single common articulation for gamefulness or gameful experience, nor is there clear consensus as to which kinds of experiences can uniquely arise from games. As a starting point, however, psychologists and game researchers have suggested the following psychological factors as characteristic of a “gameful experience”: mastery/achievement/competence (Ryan et al. 2006; Hamari & Tuunanen 2014; Yee 2006); autonomy/voluntary involvement (Avedon & Sutton-Smith 1971; Caillois 1958; Crawford 1984; Huizinga 1944; Juul 2003; Kelley 1988; Salen & Zimmerman 2004; Suits 1978; Ryan et al. 2006); flow (Csikszentmihályi 1990); immersion (Ryan et al. 2006; Yee 2006; Hamari & Tuunanen 2014) playfulness (Huizinga 1944; Webster & Martocchio 1992), and suspense/uncertain outcomes (Caillois 1961; Juul 2003). Social factors such as relatedness (Ryan et al. 2006; Yee 2006; Hamari & Tuunanen 2014) and other states commonly connected with intrinsic motivations have also been considered (see Table 1). Obviously, this list is not exhaustive and the contents of such a list depend upon the abstraction level on which it is examined. Furthermore, there is no strictly identifiable set of system elements that would be unique to games, as most of the mechanics linked to games can also be found in systems that are not framed as games. Ultimately defining a system as gamification based on its implemented mechanics would remain indeterminate. Therefore, instead of explicitly listing various psychological factors

or system elements linked to games, seekers of definitions have opted for the shorthand variants of “gameful” or “gamefulness.”

By slightly raising the conceptual abstraction level however, we can arrive at the conclusion that gamification at its core, refers to system design that aims to promote the self-purposefulness/hedonism of an activity or system in order to promote exogenous (beneficial) goals. Working on this conceptual level we can identify three elemental parts to gamification: 1) The design (affordances), 2) the psychological mediators/outcomes of gamification, and 3) the (behavioural) outcomes of gamification (Huotari & Hamari 2012; see also Zhang 2008) (Figure 2). Conceptualizing gamification in this manner allows us to connect the concept to the available literature on motivational affordances in IS research. It also enables more careful theoretical analysis of gamification, as well as practical analysis of the constituents of gamification systems. Furthermore, this conceptualization aids in positioning gamification conceptually in the IS research tradition.

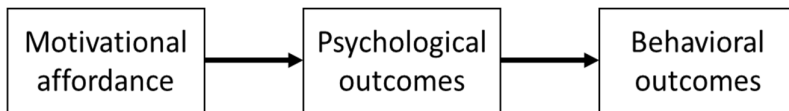


Figure 2. Abstracted elements from the definitions of gamification

It has become established in the field of human-computer interactions field and in IS literature to refer to elements of system design as the ‘affordances’ of the system. In general, affordances refer to “actionable properties between an object and an actor” (Gibson 1977). In the context of information systems, the term affordance refers to the designed or otherwise existing properties of the system or the system’s context, which enable the users to take certain actions (Gibson 1977). According to Zhang (2008), the system has to fulfil the motivational needs of the user for them to be satisfied with the system and continue with its use. Affordances addressing the motivational needs of users are referred to as ‘motivational affordances’, that is, they are stimuli designed with the intent of answering the users motivational needs and affecting the users’ psychological states (Zhang 2008; Jung et al. 2010; Huotari & Hamari 2012). These states further attempt to invoke favourable motivations and attitudes towards the respective goals and/or behaviour.

The concept of affordances is also highly compatible with the discourse on gamification as it implicitly contains the idea that users voluntarily interact with the system and its affordances, rather than seeing the system elements as something the user ‘automatically’ interacts with and adopts (Zhang 2008; Huotari & Hamari 2012). This view is also in line with the theoretical view of service-dominant logic where the value of systems/services emerge from the interaction between the user and the system rather than seeing the system as being automatically valuable (Vargo & Lusch 2004). In this vein, any system can be seen as a set of affordances which are intended to enable the user to realize system-related goals.

The definition of gamification proposed by Deterding et al. (2011) culminates around the set of affordances/game design, implying that determining whether a system is gamified is defined based on the existence of elements characteristic of games in that system. The definition of gamification proposed by Huotari & Hamari (2012) on the other hand, centres on the abovementioned ‘favourable’ motivations invoked by (motivational) affordances, implying that in order to determine whether a system invokes ‘gameful’ experiences, we need to turn our attention to the psychological outcomes that are created by the gamification efforts (see Table 2). For practical purposes, this implies that the goals of gamification are related to the outcomes of gamification rather than the design. However, psychological states and emotions also act as mediators for the behavioural end-goals of gamification. Thus, the affordances of a system invoke psychological states and emotions (Zhang, 2008) which are either an actual end goal of the system, or when induced, mediate the final behavioural outcomes. Table 1 outlines the psychological states that are commonly encountered in games. Meta-reviews (Hamari et al. 2014b; Hamari et al. 2014c) on gamification studies confirm that these psychological factors are also those commonly investigated in the literature on gamification. Behavioural outcomes refers to behaviours that are induced by the affordances and/or psychological outcomes of the system. Hamari et al. (2014b) mapped the domains of current empirical research on gamification. The review indicated that most studies were conducted in the education and learning domains. In these studies, the behavioural outcomes included for example, participation rates and learning outcomes.

Table 2. Definitions of gamification broken down into elemental aspects

Source	System elements / affordances	Psychological mediators / outcomes	Behavioural outcomes / goal	Context of gamification	Focus of the definitions
Deterding et al. (2011)	“game design elements” – elements that are characteristic of games	N/A	N/A	“non-game contexts” – Argumentation by the authors: adding game design in games is paradoxical	System
Huotari & Hamari (2012)	“(motivational) affordances” - not explicitly restricting the set of design elements	“gameful experiences” – referring to, but not limited to, a set listed in Table 1	“value creation” – derived from service marketing literature with the aim to refer to whatever set of activities that are gamified	N/A – Argumentation by the authors: it is impossible to objectively distinguish a game and a non-game context since the experience of ‘gamefulness’ is subjective and experiential	User experience

2.2 Positioning gamification in the utilitarian-hedonic IS continuum

In information systems science, the utilitarianism of a variety of systems has been extensively researched. For instance, the prevalence of theories and models such as the Technology Acceptance Model (TAM) and the Unified Theory of Acceptance and Use of Technology (UTAUT) have had a strong impact on the field's positioning. Subsequently, there has been a strong emphasis towards studying usefulness, and issues such as ease of use as primary determinants for

technology acceptance (see e.g. Davis, 1989; Davis, Bagozzi & Warshaw 1989; Venkatesh & Davis, 2000; Venkatesh, 1999, 2000). Systems designed for utilitarian purposes aim at being efficient and unobtrusive tools that enable the maximization of productivity for their users. Later however, IS research woke up to the idea that people also use systems for other than purely utilitarian reasons; namely hedonic. With these systems, the actual act of interacting with the system is by definition considered to be enjoyable in itself (van der Heijden, 2004). The use of such systems can therefore, also be intrinsically motivated (Deci & Ryan 1985; van der Heijden 2004). Similar developments emerged slightly earlier in consumer behaviour literature through the work of e.g. Hirschman & Holbrook (1982), regarding hedonic consumption. To this day, this rough divide into utilitarian and hedonic types of systems characterizes the field of information systems and information system design; the utilitarian systems focus on productivity-oriented use and aim at maximum efficiency, whereas the hedonic systems are used for entertainment-oriented leisure purposes and aim at inducing enjoyable experiences (van der Heijden, 2004).

However, during recent years a type of system has been emerging that does not seem to fall directly into either of these long-established categories. Gamification systems seem to present an interesting exception to this established conception. Gamification systems can be characterized as having utilitarian or exogenous outcomes, however, the methods and design by which they attempt to reach those outcomes are largely reminiscent of hedonic systems, that is, aimed at invoking hedonic experiences and intrinsic motivations. In other words, whilst these systems promote the goals of productivity or at least a persistence in working towards these goals, the process of reaching the goal is not characterized by maximizing efficiency. Instead of being 'invisible', unobtrusive and maximally efficient, these types of systems aim to make the core activity more motivating, enjoyable and autotelic by doing the exact opposite, that is, by noticeable interaction with the user. Summarizing these views, system types can be characterized as follows: utilitarian IS: technology as (an efficient) tool for productivity; hedonic IS: technology as a vehicle for enjoyment; gamification/motivational IS: technology as a motivator (see Table 3).

Table 3. Categorizing information systems

System type	Design	Outcomes	Examples
Utilitarian: "technology as a tool for productivity"	Aims at efficiency	Exogenous	Microsoft Word
Hedonic: "technology as a vessel for enjoyment"	Aims at invoking intrinsic motivations	Intrinsic	Angry birds
Gamification: "technology as a motivator (towards productivity)"	Aims at invoking intrinsic motivations	Exogenous	Fitocracy

However, it should be noted that when investigating the motivations and benefits of contemporary systems and services more closely, a split into clearly identifiable system types might have already become less relevant as it has become more difficult to categorize systems in terms of their use objectives or functions. This is due to current systems typically serving several functions and containing various features which serve both utilitarian and hedonic purposes (Gerow et al.

2013). For example, categorizing a large system such as the internet or a mobile phone is virtually impossible as it serves both utilitarian and hedonic purposes and objectives (Sun & Zhang 2006; van der Heijden 2004), and the use is driven by intrinsic and extrinsic motivations. Moreover, the motivations for using systems can change in their relative magnitude, during the user's lifecycle with the system (see e.g. Soliman & Tuunainen 2015). However, on the established abstraction level of system types, gamification can be distinguished as a separate type from the established forms of utilitarian and hedonic (Table 3).

2.3 Gamification midst parallel conceptual developments

Gamification also bears resemblance with other concepts beyond the utilitarian-hedonic systems dichotomy, that attempt to impact how and what decisions people make (Table 4). Perhaps the most analogous conceptual developments are persuasive technology and behaviour change support systems, which similarly to gamification refer to technology that is used to influence people's psychological states and behaviour. The differences are subtle; on the conceptual level, persuasive technology focuses more on social and communicative persuasion and attitude change (Fogg, 2003; Oinas-Kukkonen & Harjumaa 2009; Oinas-Kukkonen 2013), whereas gamification centers more around invoking users' (intrinsic) motivations (through gameful experiences and affordances – Huotari & Hamari, 2012). Similarly, loyalty programs employ an overlapping set of service designs with gamification, although loyalty programs place emphasis on economic incentives and customer loyalty as their end goal (Sharp and Sharp 1997). Most loyalty programs aim to offer economic benefits (redeemable by points) from the continuous use of services, and most likely invoke extrinsic motivations, albeit at the expense of intrinsic motivations, autonomy and creativity (Deci et al., 1999). Game mechanics in themselves however, do not provide economic benefits for the users, but are believed to add value to the service via a transformation of usage motivations and intentions (Huotari & Hamari, 2012). While gamification functions as a kind of *decision support system*, conceptual developments in the decision support system space mostly focus on methods of improving decision making. This is enabled by making information more readily and effectively available, as well as by improving the analysis of the data being used as the basis of the decision making process. Gamification on the other hand, aims to support decisions made to carry out certain activities by means of affective rather than cognitive processes. Clearly, gamification has been employed to encourage people to make “good” decisions. In behavioural economics, there is a concept that is closely related to gamification. This optimistic view to behavioural biases is called “choice architecture” and is a form of soft paternalism – “it tries to influence choices in a way that will make choosers better off, as judged by themselves” (Thaler & Sunstein 2003). It also aims to design decision making situations in such a way that harmful biases could be avoided, and/or beneficial biases could be amplified (Thaler & Sunstein 2008).

Table 4. Conceptual developments related to changing behaviour through technology

Concept	Definition	Emphasis
Gamification	'A process of enhancing services with (motivational) affordances for gameful experiences in order to support the user's overall value creation' — Huotari & Hamari (2012).	Invoking intrinsic motivations
Games (see also Table 1)	Free, no material interest, voluntary, uncertain, governed by rules, interesting choices, mastery, flow — Huizinga (1944), Caillois (1961), Avedon & Sutton-Smith (1971)	Invoking intrinsic motivations
Loyalty program	'Marketing efforts which reward, and therefore, encourage loyal customer behaviour in order to increase the profitability of stable customer relationships' — Sharp & Sharp (1997)	To increase customer loyalty (mainly via monetary rewards)
Persuasive technology	Interactive information technology designed to change users' attitudes or behaviour — Fogg (2003), Oinas-Kukkonen & Harjuma (2009)	Attitude & behaviour change (via communicative persuasion)
Behaviour change support system (Oinas-Kukkonen 2013)	"A behaviour change support system (BCSS) is a socio-technical information system with psychological and behavioural outcomes designed to form, alter or reinforce attitudes, behaviours or an act of complying without using coercion or deception." - Oinas-Kukkonen (2013)	Attitude and behaviour change
Choice architecture	'To nudge people towards the right choices [to make their lives better]' — Thaler & Sunstein (2008)	To help people make better decisions
Decision support systems	'A computer based system to aid decision-making [for running organisations more efficiently]' — Sol et al. (1987)	Support decision making by making it more efficient

3. Hypothesis development

As previously described, there are several psychological factors that could be linked to gamification, some of which are especially related to social and achievement oriented factors (see Table 1). The empirical part of this dissertation focuses especially on social (framed as social comparison - study 3 and 4) and achievement oriented (especially goal-setting related phenomenon - study 4) factors in gamification. It examines their effects to continued use, as well as the effects of gamification in promoting user retention, and increased quality and frequency of use. Thus, the studies investigate both psychological and behavioural outcomes. In particular, the first study (study 3) investigated what psychological social benefits would predict the continued use of a gamification service. The second study (study 4) investigated the effects of gamification on behavioural outcomes, and whether the amount and quality of user activities increased. In the following sub-sections, the theoretical reasonings behind the developed hypotheses are described.

3.1 Social comparison

One of the rationales behind gamification has been to harness the persuasive power that emerges when people compare their points and badges amongst each other, and in so doing “benchmark” themselves with reference to their peers. In general, this phenomenon is called social comparison (Festinger 1954), and forms an overarching concept for other more specific theories related to the effects that result from comparisons between individuals, such as social influence and the theory of planned behaviour (Ajzen 1991).

Social proof theory (Cialdini 2001a, 2001b; Goldstein et al. 2008) predicts that individuals are more likely to engage in behaviours that they perceive others to also be engaged in (Cialdini 2001b). Gamification via badges facilitates social proof by providing a means for users to observe the activities of others and the behaviours for which they have been rewarded. Cialdini (2001b) views that on the issue of social proof: “[w]e view a behaviour as correct in a given situation to the degree that we see others performing it”. The other side of this phenomenon is social validation, by which people signal their conformity, demonstrating they have also engaged in the same behaviours. Van de Ven et al. (2011) found that people were willing to pay up to 64% more for a product that their peers had already acquired. As a mode of gamification, badges facilitate social validation by providing a means for users to display their conformity to a behaviour and the expectations of others.

In a similar vein, the theory of planned behaviour (TPB) (Ajzen 1991) postulates that the opinions of others are an essential factor in determining attitudes and behaviours. This social influence refers to an individual's perception of how important others regard the target behaviour, and whether they expect them to perform that behaviour (Ajzen, 1991; Fishbein & Ajzen, 1975). In the context of this dissertation, the target psychological and behavioural outcomes are 1.1) attitudes towards using gamification, 1.2) intentions to continue using gamification, and 1.3) intentions to recommend using gamification (study 3). Study 4 investigates behavioural outcomes which are related to more specific uses of the service: 2.1) productive use, 2.2) quality of use, 2.3) social interaction, and 2.4) use activity. Social influence is likely to reflect the user's perceptions of how other users perceive the use of the service. By receiving recognition in the forms of 'likes' and comments, a user receives feedback on how well he or she has conformed to the perceived expectations of other users. Following this reasoning, in study 3, we hypothesised that subjective norms have a positive causal relationship with recognition. In other words, the more strongly a person believes that others expect and support a certain behaviour, the more positively recognition from conforming to those expectations will be perceived by the individual.

In line with Bock et al. (2005), Lewis et al. (2003), and Venkatesh & Davis (2000), we proposed that social influence (through the identification and internalisation processes relevant to group-formation - Kelman, 1958), affects attitudes towards using a service. Therefore, we considered social influence to positively affect perceptions of recognition: the more strongly a person believes that others expect and support certain behaviour, the better it feels to conform to those expectations. Furthermore, when the relevant behaviour is supported and socially accepted, such social influence has a positive effect on the attitude shown towards the service.

Based on these theorizations, in study 3 the following hypotheses were developed:

H1a Social influence positively influences the perceived amount of recognition received

H1b Social influence positively influences attitude towards the use of gamification

3.1.1 Recognition

Recognition fundamentally describes the social feedback users receive on their behaviours: users interacting with other users (Cheung et al., 2011; Lin, 2008). We proposed that receiving recognition creates willingness to recognise others reciprocally within a service, which further promotes social interaction. In this manner, receiving recognition creates reciprocal behaviour (Cialdini et al., 1992; Cialdini & Goldstein, 2004) and increases the perceived benefits received from the use of the service. Furthermore, we suggested that the service is conceived more positively (Preece, 2001) when it produces a sense of recognition

from others, thus positively affecting the user's attitude towards using the service. Therefore the following hypotheses regarding recognition were developed in study 3:

H2a Recognition positively influences perceived reciprocal benefit

H2b Recognition positively influences attitude towards the use of gamification

3.1.2 Reciprocal benefit

Reciprocity - returning one favour or positive action with another one (Cialdini, Green, & Rusch, 1992; Cialdini & Goldstein, 2004), is a social drive, argued to exist in all human cultures (Gouldner, 1960; Burger et al. 2009). When receiving feedback, people feel obligated by social norms to return the favour and reciprocate. In an IS context, reciprocal interaction can promote a form of social usefulness of the system – i.e., receiving benefit from, and in turn, contributing to, the social community (Preece, 2001; Lin, 2008; Wellman & Wortley, 1990). In order for the social community to work, it is in the best interest of the members to act reciprocally. In study 3, we operationalized the measurement of this construct as reciprocal benefits (see e.g. Hsu & Lin, 2008; Lin, 2008).

Subjective norms (Ajzen, 1991; Fishbein, 1979) and recognition (Hernandez et al., 2011; Hsu & Lin, 2008; Lin & Bhattacharjee, 2009; Lin, 2008) form a reciprocal cycle that we considered as leading to reciprocal benefits (Hsu & Lin, 2008; Lin, 2008). In the context of gamification, these reciprocal benefits manifest as a practice of motivating other users, which increases the benefits derived from the system's use. Therefore, a positive causal relationship can be expected to exist between reciprocal benefits, and attitude towards the system's use.

Furthermore, perceived reciprocal benefit can be viewed as a form of the social usefulness of the service – i.e., contributing and, in turn, receiving benefit from the social community (Preece, 2001; Lin, 2008). This reciprocity, receiving and contributing in a manner considered beneficial by the community, is likely to be of fundamental importance in encouraging users to carry out activities encouraged by the gamification system. Consequently, in study 3, we hypothesised that reciprocal benefit positively influences attitudes toward the system's use:

H3 Perceived reciprocal benefit positively influences attitude towards the use of gamification

3.1.3 Network exposure

Under the theory of network externalities, network effects (i.e., the value derived from the network) arise when the benefits from using the service depend on the number of other users (Katz & Shapiro, 1985; Lin & Bhattacharjee, 2008). The number of peers has been viewed as essential for social networking services (SNS), since they become more attractive to users as the quantity of peers or friends in the system increases (Baker & White, 2010; Sledgianowski &

Kulviwat, 2009; Lin & Lu, 2011). In fact, Lin & Lu (2011) found the number of peers to be the second most influential factor in continuing the use of an SNS.

However, we suggest that other social factors mediate the effect of network exposure, rather than directly affecting attitude. In study 3, we proposed that social influence, recognition, and reciprocal benefit mediate the effects of network exposure on the attitude expressed towards use of the system, as attitude is likely to be dependent on both the social input and the activity taking place in the network. Therefore, the following hypotheses were presented in study 3:

- H4a** Network exposure positively influences perceived social influence
- H4b** Network exposure positively influences perceived recognition
- H4c** Network exposure positively influences perceived reciprocal benefit

Attitude towards system use refers to the overall evaluation of the system's usage, be it either favourable or unfavourable and is considered to be the antecedent for behavioural intentions (Fishbein & Ajzen, 1975; Ajzen, 1991). A strong relationship between attitude and use intentions has been generally shown in several studies (see, e.g., Lin & Bhattacharjee, 2009; Bock et al., 2005; Baker & White, 2010).

The adoption of gamification has been suggested to be potentially affected by novelty effects (Farzan 2008; Hamari, 2013; Koivisto & Hamari, 2014), therefore, it is important to investigate the use continuance and willingness of users to recommend the service to others. WOM (Word-Of-Mouth) refers to a person's willingness to recommend a system to others. In the context of continued use intentions (Bhattacharjee, 2001), it reflects the satisfaction of the user with the system in question, and his or her willingness to recommend the service to other people (Kim & Son, 2009; Srinivasan et al., 2002; Cheung & Thadani, 2012). Therefore, in study 3, the following hypotheses were posed:

- H5** Attitude positively influences continued use intention.
- H6** Attitude positively influences intentions to recommend the service (i.e., WOM).

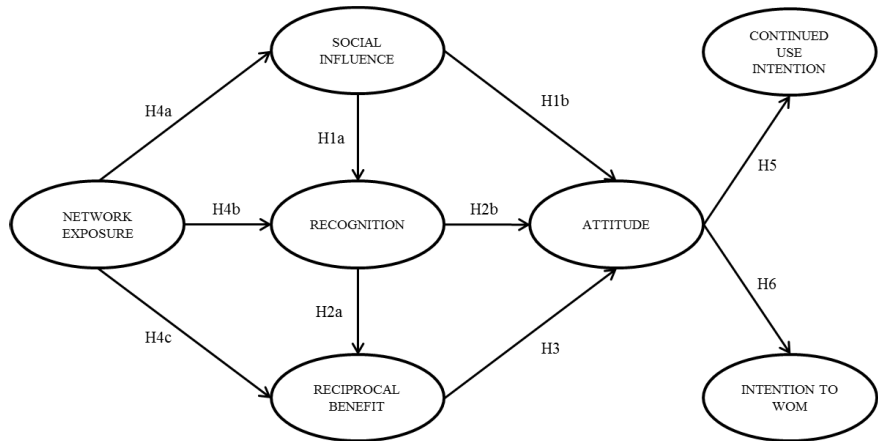


Figure 3. The research model of study 3

Study 4 investigates the social aspects of gamification in a field experiment setting, focusing on directly measuring user behaviour instead of measuring latent psychological factors. Different experimental conditions involve different independent variables. Therefore, we formulated the following hypotheses focusing on the field experiment:

H7a (*Social comparison: productive actions*). Users who are enabled to compare their badges with the badges of other users create more trade proposals.

H7b (*Social comparison: productive actions*). The number of times a user has viewed the badges of other users has a positive effect on the number of trade proposal the user makes.

H8a (*Social comparison: quality of action*). Users who are enabled to compare their badges with the badges of other users complete more transactions.

H8b (*Social comparison: quality of action*). The number of times a user has viewed the badges of other users has a positive effect on the number of transactions the user completes.

H9a (*Social comparison: social interaction*). Users who are enabled to compare their badges with the badges of other users post more comments.

H9b (*Social comparison: social interaction*). The number of times a user has viewed the badges of other users has a positive effect on the number of comments the user posts.

H10a (*Social comparison: usage activity*). Users who are enabled to compare their badges with the badges of other users generate more page views.

H10b (*Social comparison: usage activity*). The number of times a user has viewed the badges of other users has a positive effect on the number of page views the user generates.

3.2. Goal-setting

The main mechanics used in gamification have focused on goal-setting via for example the acquisition of badges and points. Therefore, study 4 concentrated on measuring whether setting goals for users through gamification is effective. Previous studies indicate that setting goals increases performance in three ways: (1) people anchor their expectations higher, which in turn increases their performance; (2) assigned goals enhance self-efficacy; (3) the completion of goals leads to increased satisfaction, which in turn leads to increased future performance with the same activities (Bandura 1993). These effects are further strengthened if the goals are context-related, immediate, and the users are provided with (immediate) feedback. It has also been found that when the goals are clearly specified in terms of how many times they have to be completed, the rate of completion of the tasks increases when compared to a condition where the number of times the task has to be completed is not specified (Ling et al. 2005).

Another effect noted from using badges has been connected to their ability to guide user behaviour because they set clear goals. It has been argued that badges function as a guidance mechanism (Montola et al. 2009; Jakobsson 2011; Hamari & Eranti 2011) in a service, providing the user with an idea of how the service is meant to be used and what is expected of the user, thus increasing the amount and quality of those actions within the service. In a larger context, goals are regarded as a central game mechanism (Salen & Zimmerman 2004) and have been demonstrated to exert persuasive power even when the progression towards them was illusionary (Kivetz et al. 2006; Nunes & Drèze 2006). Clear goals are also one of the main dimensions of flow theory (Csíkszentmihályi 1990), which predicts that having clear goals and immediate feedback supports the emergence of the flow state – where the user’s skills and the challenge of the task are optimally balanced.

Even though users may be offered clear goals as described above, they need to be committed to the goals in order for the hypothesized effects of increased motivation, engagement and performance to arise (Klein et al. 1999). According to Locke & Latham (1990), goal commitment can be defined as one’s determination to reach a goal, implying that users are more likely to persist in pursuing goals and be less likely to neglect them.

The badges in the experiment of study 4 were designed with the above goal-setting related theories in mind. They provided clear goals (including the specified numeration of goals) and immediate feedback; however their effect on performance (the dependent variables) may well be dependent on goal commitment. Therefore, the following hypotheses were formulated in the study:

H11a (*Goal setting: productive actions*). Users who are enabled to have clear goals through badges create more trade proposals.

H11b (*Goal setting: productive actions*). The number of times a user views their own badges has a positive effect on the number of trade proposals the user makes.

H12a (*Goal setting: Quality of actions*). Users who are enabled to have clear goals through badges complete more transactions.

H12b (*Goal setting: Quality of actions*). The number of times a user views their own badges has a positive effect on the number of transactions the user completes

H13a (*Goal setting: Social interaction*). Users who are enabled to have clear goals through badges post more comments.

H13b (*Goal setting: Social interaction*). The number of times a user views their own badges has a positive effect on the number of comments the user posts.

H14a (*Goal setting: Usage activity*). Users who are enabled to have clear goals through badges generate more page views

H14b (*Goal setting: Usage activity*). The number of times a user views their own badges has a positive effect on the number of page views the user generate.

4. Methodology

In general, IS research has been roughly divided into two epistemological stances (Klein & Myers 1999; Boland 1986; Orlikowski & Baroudi 1991). The differences between these stances stem from a variety of factors; some ideological and some more practical. The main ideological difference can perhaps be traced to how much we believe we can acquire accurate knowledge describing reality. The social fabric, through which we create meaning and communicate, strongly dictates how we can communicate and understand reality. Thus, there is no way to directly comprehend reality without this socially constructed proxy. This subjective and social fabric fundamentally separates our cognitions from the nature of what is ‘objectively’ real. From this perspective, our “social reality” is that in which we conduct our lives and research. Therefore, one could consider that there is no reason to go beyond it, in order to study a reality which we can’t accurately comprehend without a large margin of error. Even though such a view may be offered, there is also a practical argument for conducting interpretivist research, especially as it is considered to be more suited for pursuing complex, fine-grained social phenomena for which it would be difficult or inappropriate to set strict assumptions about their nature.

A positivist stance, on the other hand, is more oriented towards the pursuit of knowledge about the general mechanisms by which reality functions; be it ‘social’, ‘natural’ or otherwise. The positivist stance therefore emphasizes the objectivity and repeatability of observations, over any subjective or socially constructed meanings. However, this does not imply that such factors could not be the target of investigation in positivist research. Therefore, in practice positivist research aims to test hypotheses about the general mechanisms according to which reality functions, rather than investigating the fuzzy subjective logic according to which a socially constructed reality is believed to function.

In IS research, both of these stances are present. Positivist epistemology sets a set of propositions – a set of expectations about the nature of the given phenomenon, and seeks to investigate whether these hypotheses hold within the available data or a set of observations. The interpretivist perspective however, makes no strong expectations about a given phenomenon (for example in the form of deciding independent and dependent variables), but rather focuses on the complex (social) structures with the aim of understanding the phenomenon, the contexts and the processes involved (Klein & Myers 1999; Boland 1986; Orlikowski & Baroudi 1991).

The research for this dissertation was carried out using a variety of methods, as well as both interpretive and positivist research approaches (Table 5) (see e.g.

Klein & Myers 1999). Study 1 sought to understand the processes and use of IS design in marketing, from a bottom-up perspective. Studies 3 and 4 represented a positivist stance by setting propositions about the theorized phenomenon. Study 2, on the other hand, employed a conceptual-analytical approach.

The data for this dissertation was collected by three main methods: For studies 1 and 2, explorative qualitative observations were made in several game and gamification services, in order to map and conceptualize gamification, and the methods by which companies use game design in marketing and motivational design. For study 3, data was gathered using a survey which was administered to users of the Fitocracy gamification service. For study 4, longitudinal data was gathered (1.5 years) on how people used a gamified service.

The research for this dissertation used several methods of analysis. For studies 1 and 2, the research problem was approached from a conceptual-analytical perspective. “The basic assumptions behind structures in previous empirical studies are first analyzed: theories, models and frameworks used in those studies are identified, and logical reasoning to integrate them is thereafter applied” (Järvinen 2000). Study 3 employed structural equation modelling, which is a multi-level econometric modelling technique that commonly uses psychometric variables (Nunnally 1978). Study 4 focused on investigating the differences between the experimental conditions, by way of t-test, ANOVA and ANCOVA analyses (See table 5).

Table 5. Data, methods and epistemological stances

Paper	Data	Methodology	Epistemological stance
Study 1	Qualitative observations from several games and related documents	Conceptual-analytical	Interpretivist
Study 2	Qualitative observations from several services	Conceptual-analytical	n/a
Study 3	Survey. Respondent's from a service called Fitocracy	Psychometric measurement, structural equation modelling (factor analyses, econometric modelling)	Positivist
Study 4	Longitudinal 1.5-year long use data on user behaviour in a gamified service	Field experiment (2x2) design	Positivist

In the following sub-sections of the dissertation the methods of individual studies are described in more detail.

4.1 Study 1: Game design as marketing: How game mechanics create demand for virtual goods

4.1.1 Data

This empirical part of the study is based on an exploratory study of how existing massively-multiplayer online games (MMOs), and especially massively-multiplayer online role-playing games (MMORPGs), are currently creating and sustaining demand for virtual goods through their design and game mechanics. The

design patterns and game mechanics are then compared with marketing concepts and techniques in order to examine how such design can be linked with marketing science.

The virtual goods platforms referenced in the study are listed in Table 6. Most of the titles are performance-oriented games as opposed to socialising-oriented hangouts, which is somewhat visible in the scope of our study, and many of the game elements analysed below are connected to performance-oriented game rules. A few of the titles do not actually use the virtual good sales revenue model. Nevertheless, they can be equally informative cases because a demand for virtual goods exists and varies regardless of whether the operator harnesses it as a revenue stream or whether the demand is simply part of the internal mechanics of the game.

Table 6. Games, virtual worlds and other online hangouts referenced in the study

Title	Publisher
Cyworld	SK Telecom, Korea
Entropia Universe	MindArk, Sweden
EverQuest	Sony Online Entertainment, U.S.
Habbo	Sulake, Finland
IMVU	IMVU, U.S.
KartRider	Nexon, Korea
MapleStory	Nexon, Korea
Puzzle Pirates	Three Rings, U.S.
Special Force	Neowiz, Korea
Travian	Travian Games, Germany
World of Warcraft	Blizzard, U.S.
ZT Online	Giant Interactive, China

4.1.2 Procedure

We studied each title through first-hand use experience, and/or related literature and online materials. We then analyzed our observations with assistance from MMO design literature (Bartle 2004; Pardew et al. 2004; Alexander 2003, 2005) to identify generalizable design patterns and game mechanics that contribute towards creating or sustaining a demand for virtual goods.

The selection of titles discussed in this study was based on their popularity, relative variety in mechanics, and the availability of related information. Information-oriented sampling (as opposed to random sampling), is appropriate for exploratory studies and situations where a depth of information is valued over breadth (Flyvbjerg 2006). No claim is made as to how representative the identified patterns are of virtual worlds and MMOs in general; only that such patterns have been used by designers in several cases. The actual identification and abstraction of relevant design patterns and game mechanics from the cases is by necessity a somewhat subjective step, although it is grounded in design and marketing literature.

4.2 Study 2: Defining Gamification - A Service Marketing Perspective

4.2.1 Procedure

The research problem was approached from a conceptual-analytical perspective. In practice, we aimed to merge the discussion and vein of research on gamification, into the existing theoretical discussions in service marketing literature. However, we also relied on comparing qualitative observations drawn from several popular gamification and non-gamification services, with the aim of conceptualizing and arguing how gamification might differ from other marketing concepts.

4.3 Study 3: Social motivations to use gamification: an empirical study of gamifying exercise

4.3.1 Data

The data was gathered via a questionnaire within an online service that gamifies exercise. The service incorporates gamification in the form of offering an opportunity to track one's exercise and, on the basis of a point value allocated to a given exercise, enables gaining points, level-ups, and achievements (Hamari & Eranti, 2011) for one's actions, along with completing exercise quests with previously set conditions. Furthermore, other users of the service could give comments, 'likes', and encouragement on the exercise reports, achievements, and level-ups of other users, in a similar manner to that implemented in Facebook. At the time of gathering the data, the service could be used with an iPhone application or via a Web browser.

The survey was conducted by posting a description of the study and a survey link to a related discussion forum and groups. The survey was accessible only by users of the service. The questionnaire was launched on 17th October and 107 responses were gathered within the following three weeks. All respondents were entered into a prize draw for a \$50 Amazon gift certificate.

4.3.2 Procedure

The model-testing was conducted via component-based Partial Least Squares Structural Equation Modelling (PLS-SEM in SmartPLS 2.0 M3 (Ringle et al., 2005)). The key advantage of this component-based (PLS-SEM) estimation, compared to co-variance-based structural equation methods (CB-SEM), is that it is non-parametric and therefore makes no restrictive assumptions about the distributions of the data. Secondly, PLS-SEM is considered to be a more suitable method for prediction-oriented studies, while co-variance-based SEM is better suited to testing which models best fit the data (Anderson & Gerbing, 1988; Chin et al., 2003).

Convergent validity (see Table 7) was assessed with three metrics: average variance extracted (AVE), composite reliability (CR), and Cronbach's alpha (Alpha). All of the convergent validity metrics were clearly greater than the threshold cited in relevant literature (AVE should be greater than 0.5, CR greater than 0.7 (Fornell & Larcker, 1981), and Cronbach's alpha above 0.8 (Nunnally, 1978)). We used only well-established measurement items, all with a loading over 0.7. No indicators were omitted. Furthermore, there was no missing data so no imputation methods were used.

Discriminant validity was assessed first through comparison of the square root of the AVE of each construct, to its correlation with other constructs (see Fornell & Larcker, 1981), where all of the square root of the AVEs should be greater than any of the correlations between the corresponding and other construct (Jöreskog & Sörbom, 1996; Chin, 1998). Secondly, in accordance with the work of Pavlou et al. (2007), we determined that no inter-correlation between constructs was more than 0.9. Thirdly, we assessed discriminant validity by confirming that all items had the highest loadings with its corresponding construct. All three tests indicate that the discriminant validity and reliability are acceptable.

Table 7. Validity and reliability

	AVE	CR	Alpha	ATT	CUI	NE	RECIP	RECOG	SOCINF	WOM
ATT	0.773	0.932	0.902	0.879						
CUI	0.738	0.919	0.883	0.671	0.859					
NE	0.867	0.963	0.949	0.394	0.328	0.931				
RECIP	0.710	0.907	0.864	0.645	0.505	0.442	0.843			
RECOG	0.810	0.945	0.922	0.561	0.401	0.517	0.657	0.900		
SOCINF	0.696	0.901	0.854	0.638	0.448	0.367	0.503	0.423	0.834	
WOM	0.721	0.912	0.871	0.773	0.613	0.468	0.660	0.728	0.641	0.849

ATT = attitude, CUI = continued use intentions, NE = network exposure, RECIP = reciprocal benefits, RECOG = recognition, SOCINF = social influence, WOM = word-of-mouth intention. The figures in boldface on the diagonals correspond to square roots of the average variance extracted for the corresponding construct.

4.4 Study 4: Transforming Homo Economicus into Homo Ludens: A Field Experiment on Gamification in a Utilitarian Peer-To-Peer Trading Service

4.4.1 Data

Sharetribe (<https://www.sharetribe.com/>) is an international peer-to-peer trading service which offers its service package to a variety of organizations. At the time of writing, the available localizations were in English, Spanish, Finnish, Greek, French, Russian and Catalan. Sharetribe is used in communities all over the world and at the time of writing there were 479 local Sharetribes world-wide. The company, Sharetribe Ltd, is a social for-profit enterprise registered in Finland. Their mission is to help people connect with their community and to help eliminate excess waste by making it easier for everyone to use assets more effectively by sharing them.

Sharetribe's marketing strategy focuses on differentiating itself from other trading services such as eBay or Craigslist, by being targeted to narrow local

communities such as an organization or town districts and by also offering tools for non-monetary transactions, including borrowing and carpooling. Users can however buy and sell goods and services. Sharetribe uses open source principles in the design of their service and the entire code is offered for anyone to download. The reason for having many "tribes" is to emphasize local communities, trust and information access, and also to diminish transaction costs and costs related to shipping.

4.4.2 Procedure

The field experiment was setup in the Sharetribe service and data was gathered from the time of the implementation of badges at the beginning of December 2010, until the end of July 2012. During this time the service remained the same without any major upgrades.

The existing users were evenly and randomly assigned to four test groups (Tables 8 and 9). Users who registered after the implementation were further randomly assigned to one of the groups.

Table 8. Experimental groups – Independent variables

		<i>Ability to see which actions can unlock badges (clear goals)</i>	
		No	Yes
<i>Ability to view other users' badges (social comparison)</i>	No	Group 1	Group 3
	Yes	Group 2	Group 4

The data consisted of a database of users of the Sharetribe Aalto University site who registered during the experiment timeframe (n=3234). It included the number of trade proposals, accepted transactions, comments posted and how many individual page views a user undertook. We selected only those users who had registered during the experiment timeframe, because older users have existing trade proposals in the service and would therefore have accumulated actions during the experiment timeframe which would not have been affected by the experiment. We selected the Aalto University Sharetribe site for the experiment because it is the largest implementation of Sharetribe of the several hundred installations world-wide.

The experiment was purposefully conducted as a field experiment in a real existing service, rather than in a laboratory setting in which respondents would have been asked to assume a hypothetical scenario of a badge system. In this way we could avoid using self-reported data which might potentially reflect novel or glorified attitudes towards the idea of using game mechanics. This approach was expected to achieve a higher level of validity.

Table 9. Users in treatment groups

	Count	%
Group 1: Both features disabled (control)	805	24.9
Group 2: Social comparison condition	802	24.8
Group 3: Clear goals condition	790	24.4
Group 4: Both conditions enabled	837	25.9
Total	3234	100 / 100

For the experiment, the badges were designed in adherence to previous work on conceptualizing the badge game design pattern (See Hamari & Eranti, 2011; Jakobsson 2011), as well as to resemble popular implementation approaches such as those found in Foursquare, the Steam gaming platform and Xbox Live.

The users could unlock badges for typical actions within the service, such as commenting on other peoples' trade proposals, submitting proposals of their own, completing trades and even for using the service for a prescribed amount of consecutive days. The unlocked badges were displayed on the users' individual profiles which were viewable by the owner of the badges and also other users in the respective study groups. Users were notified via email for every badge they unlocked.



Figure 4. View of the user's badges in Sharetribe

Users could also view badges on a separate page linked to every users' profile (Figure 4), where they could see which badges they had unlocked (coloured), and which badges they were yet to unlock (grey). Users in the respective study groups could also see a text that explicitly told which activities would unlock badges.

5. Results

This section describes the key results of the thesis by firstly summarizing them across the studies, and secondly by describing the results of the individual studies in more detail.

5.1 Summary of the results

The first part of the results section of this dissertation pertains to theoretically linking gamification literature in marketing and IS, firstly by conceptually linking observations drawn from actual games of how game developers use game mechanics in their services as means of marketing (Study 1). Secondly, a definition for gamification was formed by triangulating theories taken from game studies, motivational psychology, service marketing and IS/HCI.

As defined in the aforementioned literature, gamification can be conceptualized as a three-level phenomena, with: 1) information system (motivational) affordances, 2) psychological outcomes, and 3) behavioural outcomes (Huotari & Hamari 2012). The empirical part of the dissertation has attempted to capture all of these three levels. Study 3 examines the social influence on a gamified system, and its influence on attitude and use continuance towards such system. The results indicate that social factors play an important role in predicting the use of gamified systems. Study 4 on the other hand, focuses on the effects on use of implemented gameful affordances. This 1.5-year field experiment focused on whether providing users with clear goals and enabling social features (through badges, see e.g. Hamari & Eranti 2011) affected the amount and quality of contributions, the amount of social interaction, and overall use activity. Surprisingly, the results showed that merely enabling these features did not have any significant overall effect on use. However, those users who actively followed up on the accumulation of their own badges posted and accepted more trades, as well as commented more on the trade proposals of others. Comparing badges was also positively associated with making more trade proposals. The study discusses possible reasons for these results, such as the context of use, the nature of the gamified service, user intentions, and the sporadic nature of service use.

5.2 Study 1: Game design as marketing: How game mechanics create demand for virtual goods

In this paper, we considered the question of how game companies use game design as a means of marketing, and focused on how the rules and mechanics that

developers build into online games encourage virtual goods purchases. The theoretical perspective was based on marketing, viewing game design as one aspect of a company's marketing process. Our objective was firstly to identify game design patterns that create and sustain demand for virtual goods. Secondly, we looked to associate and compare them with analogous marketing concepts, so as to obtain new insights about both game design and marketing (Table 10).

Based on the findings, we assert that game designers, by creating and modifying the rules and mechanics of the game, SNS or other online hangout, have an essential, but sometimes unrecognised role in planning the marketing of virtual goods. Game operators create the market environment, are able to adjust the environment in which their products are sold and marketed, and also fine-tune the rules according to which the products are used. This uniquely wide and flexible position the company occupies in the life cycle of the products, requires a wide approach to be taken to marketing.

Table 10. Game design as a method to increase demand for virtual goods

Design pattern	In marketing terms	Towards	Aims to
Stratified content	Segmentation, differentiation	Rules, environment	Create segmentation, enable differentiation and generate incentives for repeated purchases
Status restricted items	Differentiation, planned obsolescence	Items	Enforce segmentation and generate incentives for repeated purchases
Increasingly challenging content	Segmentation, differentiation, planned obsolescence	Rules, environment	Enforce segmentation and generate incentives for repeated purchases
Multidimensional gameplay	Segmentation, differentiation	Gameplay	Create segmentation and enable differentiation and create differentiated additional settings for virtual goods
Avatar types	Segmentation, differentiation	Avatar	Create segmentation and enable differentiation
Design	In marketing terms	Towards	Aims to
Item degradation	Planned obsolescence	Items, rules, environment	Create incentives for repeated purchases
Inconvenient gameplay elements	Core product -> Augmented product	User interface, gameplay	Create settings for additional virtual goods and services
Currency as medium	Psychological pricing	-	Create incentives for (repeated) purchases
Inventory mechanics	-	Items, avatar	Create incentives for repeated purchases
Special occasions	Promotional	Environment, items	Benefit from cultural patterns that encourage buying behaviour and create settings for additional virtual goods
Artificial scarcity	Exclusiveness	Items, environment, rules	Make selected virtual goods more desirable
Alterations to existing content	-	Environment, items, rules, gameplay	Create new settings for virtual goods to have value

Even though virtual world operators have been forerunners in the merging of game design and marketing, there still seems to be a way to go before game design is harmonised with overall business logic. Many virtual world operators find themselves in a situation where revenue generation logic is distanced from the design of the service itself. If an operator was to change their revenue generation logic, it would also require drastic changes to the service itself. For example, *Chronicles of Spellborn* (operated by Acclaim Games), had to undergo a costly re-development due to a change of revenue model from subscription to free-to-play. One potential direction for future research could thus be found in examining how business models and service design (including game design)

could be integrated and aligned from the start. As a first step, this could entail theoretical work that combines game mechanics with business model literature.

An important conclusion that can be drawn from the results is that it is possible to see many traditional marketing techniques as the equivalent of game design patterns. From this perspective, the task of planning a marketing strategy for a traditional product or service could be approached as a task of creating a game design: a structure of choices, restrictions and incentives that engage the player-consumer in an interactive relationship with the product or service. Marketers already use terms and devices reminiscent of game design: progressions, levels, prizes, collectibles, memberships and points, among others. However, as game design patterns, these devices are not very advanced. With these real-life “marketing games”, arguably the game is too simplistic, the game fails to engage for more than a short period of time, the game is too easy to provide excitement or too difficult to be rewarding, or the marketer’s commercial motive is blatantly obvious, so preventing immersion in the game.

Our suggestion to marketing managers is, therefore, to approach the marketing task as a serious game design challenge: to hire professional game designers, to consult the large body of literature on game design, and to strive to create engaging games around their products and services. The whole customer relationship, from acquisition through retention to monetisation, could be modelled as an interactive game. This approach would be especially suited for businesses where customer interaction is mostly computer-mediated, and the variety of possible interactions is restricted. On the other hand, businesses with face-to-face interactions and a complex variety of possible interactions could perhaps apply game design on a suitably abstract layer, and also make use of the techniques and patterns seen in so-called pervasive gaming: games that are layered into everyday life as opposed to being played on a distinct device at a distinct time (Montola & Stenros 2009).

One challenge in implementing advanced game design patterns in more traditional forms of business is the obvious lack of “gameness” in such services. Complex rules and achievements might be difficult to articulate in marketing communications without an explicit agreement that there is a game in progress. One potential direction for further research could be to examine ways in which marketers could build game mechanics into marketing strategies, in contexts where there is no explicit agreement that a “game” is being played; in other words, research on “business game design”.

Finally, a further possible link for the patterns identified in this study is so-called captology or persuasive technology: the notion of using technology to persuade people to change their behaviour towards a desired goal (Fogg 2003). These patterns can be seen as one branch or subset of persuasive techniques that could be applied in a variety of areas. The potential applications for persuasive technology are diverse, ranging from promoting environmentally friendly behaviour (Nakajima et al. 2008), to motivating exercise (Toscos et al. 2006) or house cleaning (Strengers 2008). Selling products or services could also be seen as one application area, linking game design, persuasive technology and marketing.

Malaby (2007) suggests that if we look at games as domains of artificial outcomes or “contrived contingency”, we find that society is full of games: ones associated with business risk, others associated with political risk, and others that relate to cool consumption styles, popularity and friends. Increasingly, the distinction between computer games and these other “games” in the society is blurring, with MMOs and SNSs blazing the trail. It should perhaps not be surprising that we can find similarity in the rules and structures of these domains, even if the study of those rules takes different names, such as marketing or game design. A promising direction of research, pioneered in this study, is to take what we have learned in one domain and adapt it to others.

5.3 Study 2: Defining Gamification - A Service Marketing Perspective

The resulting contribution of this study is articulated in more breadth in section 2.1. In this paper, we defined gamification from the perspective of service marketing, as a process of enhancing a service with affordances for gameful experiences in order to support the user’s overall value creation. This anchoring of gamification into the existing body of knowledge of service marketing and its concepts like ‘service package’, ‘value-in-use’ and ‘service systems’ will help subsequent research to examine how gamification can contribute to marketing sciences. It also provides gamification research with proven theoretical models to build upon.

5.4 Study 3: Social motivations to use gamification: an empirical study of gamifying exercise

In this paper, we investigated how social motivations predict attitudes towards the use of gamification, and the intentions to continue using a gamified service. The results indicate that social factors are strong predictors for how gamification is perceived, whether the user intends to continue using the service, and/or recommend it to others. Additionally, these relationships were further positively influenced by the degree to which users are exposed to other users within the service.

The research model (Figure 5) could account for 59.8% of the continued use intention for the gamification service, as well as 45.1% of intention to recommend the service to other people. Furthermore, social factors accounted for 56.5% of the variance of attitudes toward the use of a gamified service. The model also accounted for 13.4% of the variance in social influence, 33% of recognition, and 44.6% of the variance of perceived reciprocal benefit.

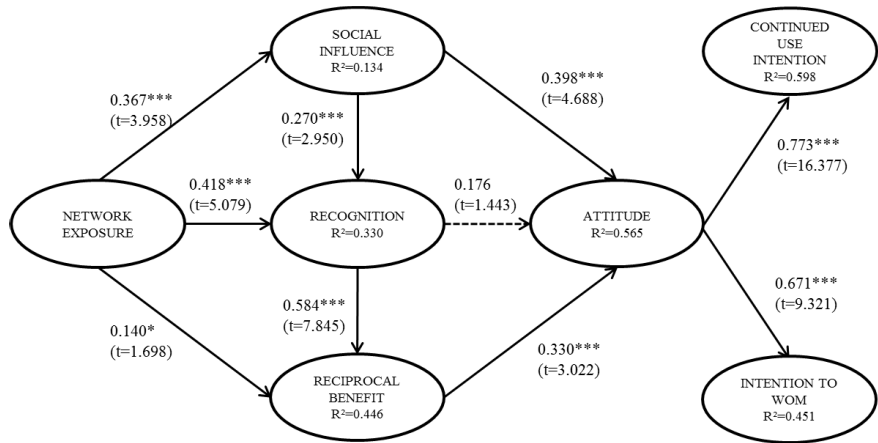


Figure 5. Path model results.

Overall, the results support all of the hypotheses except for hypothesis H2b. Network exposure positively influences all three social persuasion-related constructs (H4a–c). Social influence positively affects attitude directly (H1b) and also the perceived degree of recognition users receive (H1a). Our results indicate that recognition does not have a significant direct effect on attitude (H2b), however, it has a positive influence on the perceived reciprocal benefits gained from the use of the service (H2a). Perceived reciprocal benefits were found to be a strong predictor for attitude toward the service (H3). Attitude was found to be a strong predictor of both intentions measured: intent to continue using the service (H5) and intentions to recommend the service to other people (H6).

Table 11. Confirmation of hypotheses in study 3.

H#	Description	Support?
H1a	Social influence positively influences the perceived amount of recognition received	Yes
H1b	Social influence positively influences the attitude toward the use of gamification	Yes
H2a	Recognition positively influences perceived reciprocal benefit	Yes
H2b	Recognition positively influences attitude toward the use of gamification	No
H3	Perceived reciprocal benefit positively influences the attitude toward the use gamification	Yes
H4a	Network exposure positively influences perceived social influence	Yes
H4b	Network exposure positively influences perceived recognition	Yes
H4c	Network exposure positively influences perceived reciprocal benefit	Yes
H5	Attitude positively influences continued use intention	Yes
H6	Attitude positively influences intentions to recommend the service	Yes

The results also indicate that the amount of recognition users receive might not directly affect their attitudes toward gamification to any significant degree. However, recognition did have an indirect effect on attitude, through the associated increase in perceived reciprocal benefits. This could be due to the fact that simply receiving recognition – e.g., in the form of ‘likes’ – might not improve how the service is perceived, unless at the same time, the user feels that receiving and giving recognition increased the benefits they gained from using the service. This would further explain the indirect effect of perceived reciprocity on attitude through any beneficial experience created by the service.

The results indicate that attitude toward a gamification service is a strong determinant of one's intentions to continue using the service, as well as the intention to recommend the service to others. Thus, the study further confirms the role of attitudes in explaining behavioural intentions (Ajzen, 1991).

5.5 Study 4: Transforming Homo Economicus into Homo Ludens: A Field Experiment on Gamification in a Utilitarian Peer-To-Peer Trading Service

5.6 Summary of the results

This article reported the results of a 1.5 year-long field experiment on gamifying a utilitarian trading service by the implementation of badges. The study was able to confirm that users who had actively exposed themselves to badges were also significantly more likely to actively use the service, list their goods for trade, comment on listings, and to complete transactions. Furthermore, the results indicate that actively browsing other users' badges was positively associated with posting trade proposals in the service. However, the hypotheses concerning that implementing gamified features would alone lead to significant overall increases in usage frequency, quality or social interaction in a utilitarian trading service could not be supported.

5.7 Results in length

A simple t-test (Table 12) on the dependent variables did not show any significant differences between the experiment conditions.

Table 12. t-tests on dependent variables between experimental groups

Test group id	Social comparison / Clear goals	Trade proposals		Accepted transactions		Comments		Page views	
		Mean	SD	Mean	SD	Mean	SD	Mean	SD
1	No / No	1.00	3.08	0.52	1.61	0.62	2.20	115.18	263.77
2	Yes / No	1.15	3.55	0.49	1.64	0.70	2.61	106.47	281.01
3	No / Yes	0.92	3.25	0.48	1.48	0.63	2.14	97.32	243.55
4	Yes / Yes	1.04	3.13	0.40	1.35	0.63	2.72	97.84	252.58

A multivariate test (MANOVA) was performed on the effects of the possibilities to compare badges with other users, $F(4, 3227) = 1.679, p = 0.152$, Wilk's = 0.998, $\eta^2 = 0.002$; the ability to see from what actions one can unlock badges, $F(4, 3227) = 0.709, p = 0.568$, Wilk's = 0.999, $\eta^2 = .001$; and the interaction of the features, $F(4, 3227) = 0.716, p = 0.581$, Wilk's = 0.999, $\eta^2 = .001$, on the following dependent variables: the amount of trade proposals, accepted transactions, comments posted and page views. These tests did not yield any significant results.

However, this sample included all the users in the data who had registered with the service during the experiment timeframe. Therefore, we moved to a more confined sample population in order to increase the level of internal validity. From the data, we selected only those users who had actively used the

service after the implementation of badges, by selecting only those that had at least 100 page views. This way we could be confident that all the users in the sample had the possibility of being exposed to the experimental conditions. Even with this sub-sample however, the results did not change remarkably: *social comparison* feature: $F(4, 716) = 1.549, p = 0.186, \text{Wilk's} = 0.991, \eta^2 = 0.009$, or the *clear goals* feature, $F(4, 716) = 0.320, p = 0.865, \text{Wilk's} = 0.998, \eta^2 = 0.002$, or their interaction, $F(4, 716) = 0.507, p = 0.731, \text{Wilk's} = .997, \eta^2 = 0.003$.

We then tested the individual hypotheses by exploring the effects on individual dependent variables using separate ANOVA analyses. However, even here, we were unable to determine any significant effects from the two features on any of the dependent variables (Table 13), and therefore we were unable to find evidence to support hypotheses 7a-14a.

Table 13. Test of hypotheses 7a-14a

H#	Independent variable	Dependent variable	Result (users registered during the experiment n=3234)			Results (only active users - at least 100 page views n=723)		
			F	p	η^2	F	p	η^2
7a	Comparison	Number of trade proposals	1.265	0.261	0.000	2.186	0.140	0.003
11a	Goal		0.695	0.405	0.000	0.166	0.683	0.000
	Comparison x Goal		0.022	0.882	0.000	0.333	0.564	0.000
8a	Comparison	Number of accepted transactions	1.131	0.288	0.000	0.790	0.374	0.001
12a	Goal		1.405	0.236	0.000	0.715	0.398	0.001
	Comparison x Goal		0.143	0.705	0.000	0.716	0.398	0.001
9a	Comparison	Number of comments	0.174	0.677	0.000	0.244	0.621	0.000
13a	Goal		0.110	0.741	0.000	0.015	0.901	0.000
	Comparison x Goal		0.248	0.619	0.000	0.769	0.381	0.001
10a	Comparison	Number of page views	0.200	0.655	0.000	0.052	0.820	0.000
14a	Goals		2.087	0.149	0.001	0.598	0.440	0.001
	Comparison x Goal		0.254	0.614	0.000	0.017	0.897	0.000

We then tested whether we could find support for hypothesis 7-14b pertaining to whether active exposure to gamified elements has a positive effect on the dependent variables. The exposure was measured via the number of views of the badge pages of other users (*social comparison* condition 7b-10b) and the number of views of the users own badge page (*clear goals* condition – 11b-14b). Multivariate testing (MANCOVA) on the effects derived from: viewing other users' badges ($F(4, 3228) = 5.814, p = 0.000^{***}, \text{Wilk's} = 0.993, \eta^2 = 0.007$), viewing the users own badges ($F(4, 3228) = 565.361, p = 0.000^{***}, \text{Wilk's} = 0.588, \eta^2 = 0.412$), and their interaction ($F(4, 3228) = 58.324, p = 0.000^{***}, \text{Wilk's} = 0.933, \eta^2 = 0.067$) all showed significant results. However, the effect of viewing other users' badges was relatively small.

We then moved on to testing hypotheses individually by using ANCOVA tests. The results showed that the amount of views of the users own badges was positively associated with all the dependent variables, whereas the amount of views of other people’s badge pages was only positively associated with the number of submitted trade proposals (Table 14). Based on these tests, we can conclude that comparing badges does seem to have a positive effect on use, however, it is so small that the effects were difficult to independently establish for the different dependent variables and the only significant effect from the comparison was seen in the amount of trade proposals a user makes.

Table 14. Test of Hypotheses 7b-14b.

H#	Independent variable - Views to:	Dependent variable	Results		
			<i>F</i>	<i>p</i>	η^2
7b	badge pages of others	Number of trade proposals	5.450	0.020**	0.002
11b	own badge page		810.885	0.000***	0.201
8b	badge pages of others	Number of accepted transactions	2.247	0.134	0.001
12b	own badge page		1034.045	0.000***	0.242
9b	badge pages of others	Number of comments	1.957	0.162	0.001
13b	own badge page		720.280	0.000***	0.182
10b	badge pages of others	Number of page views	1.398	0.239	0.000
14b	own badge page		2253.084	0.000***	0.411

It is commonplace to use ANOVA or similar types of analysis, even if data is not normally distributed. In this study, the dependent variables are not normally distributed as there were more users with 0 actions than users with 1 action, more users with 1 action than 2 actions and so forth. Therefore we ran the test again using the Mann-Whitney U test which is nonparametric and especially suitable for handling non-normal data. Even here however, the results remained insignificant (*p*-values: H7a 0,972, H8a 0,256, H9a 0,795, H10a 0,193, H11a 0,965, H12a 0,745, H13a 0,430, and H14a 0,169). The same was also the case with the sub-sample only consisting of active users (≥ 100 page views): (*p*-values: H7a 0,084, H8a 0,136, H9a 0,568, H10a 0,509, H11a 0,916, H12a 0,934, H13a 0,882, and H14a 0,399).

Table 15. Confirmation of hypotheses

H#		Hypothesis	Supported
7a	<i>Social comparison: productive actions</i>	Users who are enabled to compare their badges with the badges of other users create more trade proposals.	No
7b	<i>Social comparison: productive actions</i>	The number of times a user has viewed the badges of other users has a positive effect on the number of trade proposals the user makes.	Yes
8a	<i>Social comparison: quality of actions</i>	Users who are enabled to compare their badges with the badges of other users complete more transactions.	No
8b	<i>Social comparison: quality of actions</i>	The number of times a user has viewed the badges of other users has a positive effect on the number of transactions the user completes.	No
9a	<i>Social comparison: social interaction</i>	Users who are enabled to compare their badges with the badges of other users post more comments.	No
9b	<i>Social comparison: social interaction</i>	The number of times a user has viewed the badges of other users has a positive effect on the number of comments the user posts.	No
10a	<i>Social comparison: usage activity</i>	Users who are enabled to compare their badges with the badges of other users generate more page views.	No
10b	<i>Social comparison: usage activity</i>	The number of times a user has viewed the badges of other users has a positive effect on the number of page views the user generates.	No
11a	<i>Clear goals: productive actions</i>	Users who are enabled to have clear goals through badges create more trade proposals.	No
11b	<i>Clear goals: productive actions</i>	The number of times a user has viewed their own badges has a positive effect on the number of trade proposals the user makes.	Yes
12a	<i>Clear goals: quality of actions</i>	Users who are enabled to have clear goals through badges complete more transactions.	No
12b	<i>Clear goals: quality of actions</i>	The number of times a user has viewed their own badges has a positive effect on the number of transactions the user completes.	Yes
13a	<i>Clear goals: social interaction</i>	Users who are enabled to have clear goals through badges post more comments.	No
13b	<i>Clear goals: social interaction</i>	The number of times a user has viewed their own badges has a positive effect on the number of comments the user posts.	Yes
14a	<i>Clear goals: usage activity</i>	Users who are enabled to have clear goals through badges generate more page views.	No
14b	<i>Clear goals: usage activity</i>	The number of times a user has viewed their own badges has a positive effect on the number of page views the user generates.	Yes

6. Discussion

6.1 Contributions

Overall, gamification has become a seriously regarded topic of inquiry in the scholarly domain during the period when the research for this dissertation was conducted (see e.g. Hamari et al. 2014). Not only has it become a serious inquiry but also the phenomenon has been more strongly tied to established theories and veins of literature. The research undertaken for this dissertation has played a notable part in this development (e.g. based on citations), in 1) being one of the seminal works which introduces the notion of the use of game mechanics into marketing and user engagement (Study 1); 2) defining gamification and tying the phenomenon into the larger context of services marketing (Study 2); 3) empirically investigating its social (Study 3 and 4) and goal-oriented effects on use behaviour (Study 3 and 4) (Table 16).

Table 16. Contributions at a glance

Precursors (Study 1)	Defining (Study 2)	Social factors in use continuance (Study 3)	Effects on use (Study 4)
Theoretically linking gamification	Theoretically linking gamification	Theoretical contributions related to theories on social influence (in gamification)	Theoretical contributions / findings
Gamification / Game design - marketing	Gamification - Service marketing	Network effects are mediated by social factors rather than having a direct effect on attitude and use	Gamification design aiming to increase social comparison related experiences did not increase usage behaviour significantly
Game design - gamification / persuasive technology / gamification	Gamification - Game studies literature on why people play games	Getting recognized and further reciprocal benefits can have an essential role in predicting attitude formation and use, rather than mere one-directional social influence	Gamification design aiming to increase goal setting related effects did increase usage behaviour for active users
Instigating a theoretical lens for investigating marketing through game design	Gamification vis-à-vis other parallel conceptualizations	Recognition alone might not be enough to significantly affect attitude and use unless at the same time it leads to increased relatedness	

<p>Observations on how game developers use game design to increase demands</p>	<p>Definition for gamification</p>	<p>The size of the users' community is important for benefiting from the social benefits</p> <p>Practical implications</p>	<p>Theoretical / practical implications about the effectiveness of gamification</p>
<p><i>Segmentation through game design:</i> Stratified content, status restrictions, difficulty curve, horizontally split content, avatar design</p>	<p>The understanding and the shift towards a psychological focus in gamification (rather than a focus on system elements)</p>	<p>Affording features that enable users/community to signal norms within the IS community (enabling the diffusion of norms)</p>	<p><i>Adjusting popular expectations:</i> There is no reason to believe gamification would 'automatically' affect user activity</p>
<p><i>Designing for scarcity and demand through game structures:</i> Use of virtual currency, Item degradation, Intentional UI limitations, Demand shocks through events, General ability to alter the service</p>	<p>The conception into three elementary elements and their relationships: 1) The affordances - > 2) gameful psychological mediators/outcomes -> 3) behavioural outcomes</p>	<p>Providing features (such as sharing functions and badges) that afford users to communicate or make visible their behaviour related to accepting the social influence</p>	<p><i>Context matters:</i> Utilitarian vs. hedonic</p>
	<p>Operationalization of gamification to support further empirical investigations</p>	<p>Providing features (such as "liking" and commenting) that enable users to give feedback on other users' activities (enabling recognition and thus supporting relatedness for emergence of intrinsic motivations).</p>	<p><i>Context matters:</i> Sporadic vs. pervasive</p>
	<p>Conceptual contributions to the discussion on 'what can be gamified'</p>	<p>Supporting continued social interaction within the IS in order to enable sustainable group formation and cooperation (positively influencing the formation of reciprocal benefits).</p>	<p><i>Users matter:</i> Active vs. inactive</p>
		<p>Enabling users to interact with new users in order to grow their relevant community within the IS. As our findings suggest, the size of the relevant peer-group within the IS further promotes all of the aspects of social influence</p>	<p><i>Users matter</i> Rational vs. affective involvement</p>
		<p>Diffusion of norms is likely to promote goal commitment toward goals in the system. Commitment toward common goals is likely to be an important antecedent for successful gamification</p>	

6.2 Theoretical implications

The conceptual work of this dissertation highlights the essentiality of the psychological aspects of gamification, running contrary to other definitions and conceptualizations (discussed in length in section 2.1.). Merely focusing on the design elements and behavioural outcomes in gamification drastically limits the scope and understanding of the phenomenon in several ways. First of all, while

the goal of gamification commonly pertains to changing user/customer behaviour, in gamification a crucial aspect are those psychological factors that mediate the effects of gamification and behaviour change. Without understanding those factors, there is no way for developers to really understand the forces driving gamification. Another implication is that while other definitions have highlighted the use of 'game design' in gamification, I question this approach - since the psychological factors are a central focus in gamification, then does it really matter so much what the actual design elements were if they lead to the desired outcomes? Moreover, strictly focusing on existing games as an inspiration for motivational design could limit the available choice of different design techniques.

The conceptual work in this thesis points to a paucity in conceptions of how games and gamification have been initially defined, and this raises questions as to whether precisely defining them is even feasible. Ultimately, defining gamification seems to depend upon the definitions of games. Herein we have refocused the abstraction level and merged the definition of gamification with other existing frameworks (e.g. Zhang 2008). This thesis proposes that gamification can be seen to consist of three causally linked main parts: 1) system affordances that invoke (2) psychological mediators and/or outcomes, which ultimately invoke (3) behavioural outcomes. This conceptual understanding firstly adds to simpler conceptions where psychological aspects have been somewhat neglected, as well as by raising the abstraction level in a way that it can function as a basis for further theorization about the relationships between the systemic, psychological and behavioural aspects of gamification.

The empirical part of the dissertation investigates how social motivations predict attitude towards the use of gamification and intentions to continue using a gamified service. The results indicate that social factors positively predict how gamification is perceived, and whether the user intends to continue using the service and/or recommend it to others. Additionally, these relationships are positively influenced by the degree to which users are exposed to other users in the service. The results indicate that the amount of recognition users receive might not directly affect their attitudes toward gamification to any significant degree, however, recognition did have an indirect effect on attitude, through the perceived reciprocal benefits. This could be due to that simply receiving recognition – e.g., in the form of 'likes' – might not improve how the service is perceived unless, at the same time, the user feels that receiving and giving recognition increased the benefits derived from using the service. This would further explain the indirect effect which perceived reciprocity has on attitude through beneficial experiences created by the service.

Understandably, the larger the network, the more it is possible to receive recognition, be exposed to more social influence, and receive more reciprocal benefits from its use. However, the results show a relatively weak direct relationship between network exposure and reciprocal benefits. This could imply that the size of the network might not have so much intrinsic value with regard to reciprocal benefits directly. Instead, one could posit that the influence stems from the quality of the connection with other people and/or the frequency and

nature of the interaction. Further inferences about this relationship, however, are beyond the scope of this study and remain possible avenues for future enquiry. The results indicate that attitude toward a gamification service is a strong determinant of one's intentions to continue using the service as well as of intentions to recommend the service to others. Thus the study further confirms the role of attitudes in explaining behavioural intentions (Ajzen, 1991).

Although study 3 was more focused on prediction rather than model testing, it also points to theoretical contributions related to the structure of the phenomenon of social influence. It provides a more holistic understanding of the process of social influence in the context of IS adoption, and in behavioural change motivated by affordances in IS. One of the motivations for this study stemmed from the notion that social influence is undoubtedly a pertinent phenomenon, especially in the post-adoption phase of ISs. The research was also motivated by the observation that current studies had not comprehensively investigated the role of compliance and conformation-related aspects of social influence, which according to theories in social psychology are elemental aspects of the phenomenon. In previous IS studies, social influence has commonly been investigated by measuring subjective norms with TRA/TPB (e.g. Ajzen, 1991; Fishbein, 1979) in the pre-adoption phase. However, merely measuring subjective norms gives a restricted view of the process of social influence. Therefore, beyond those basic empirical findings about how social factors may predict attitude and continued use, this study provides a magnified look at social influence not only in gamification but also on IS adoption in general.

Guided by theoretical developments in social psychology (Cialdini et al. 1992; Cialdini and Goldstein 2004), social influence is not only confined to individual perceptions about the beliefs of relevant others; it also includes the positive recognition which results from signalling conformation to those norms. Therefore, this research looked to expand theories of reasoned action and planned behaviour with recognition, i.e. the degree of positive feedback from conforming to subjective norms. Furthermore, it was believed that reciprocal influence-compliance (Cialdini & Goldstein 2004) with the community's norms could promote the perceived increase in mutual benefits derived from use. Therefore, it was hypothesized that the size of the immediate community within the IS would have a positive effect on all of the social aspects measured within the study. The theoretical contributions of this study on understanding the process of social influence in IS continuance are two-fold: 1) Extended social influence; and 2) increased knowledge on: 2.1) The role of network exposure on social influence, 2.2) The role of social influence on IT use continuance, and 2.3) The place of behaviour continuance when encouraged by a motivational IS. These theorizations were supported by the empirical study presented in this dissertation (see section 5.4 and Figure 5).

In the field experiment part of the dissertation, a somewhat unexciting result related to the lack of overall effects achieved by the introduction of gamified elements was seen. This could potentially be explained by several factors, such as a low goal commitment (Locke & Latham 1990; 1990, Klein et al. 1999) toward the badges, which was hypothesized to be a prerequisite that would enable

the badges to arouse the desired effects. A low goal commitment could be explained by a number of different conditions within the gamified setting, dependent on the nature of the underlying service. It can be hypothesized that users in such a focused utilitarian service concentrate more on pre-meditated utilitarian activities and exercise a considerably more cognitive rather than affective involvement (Zaichkowsy 1994). Therefore, the more hedonic service elements could be chosen to be ignored by the majority of the user population. Stemming from this, it would be useful to measure the involvement (Zaichkowsy 1994) and goal commitment (Locke & Latham 1990) of the users and use them as moderators in further similar studies.

Another possible explanation for low goal commitment and affective involvement could be that badges were introduced long after the launch of the service. As such, the user population may not have expected 'gameful' interactions. If we consider popular gamified services such as Foursquare, they have been advertised as gameful services from the outset. Consequently, these services attract users who have preferences that lean towards gameful interaction. Therefore, it might be easier to demonstrate the effectiveness of gamification in environments which have attracted a user populace that would be receptive to gameful interaction. In the present experiment, gamification was implemented in a relatively utilitarian service where the user population had registered in order to trade goods and services, without any knowledge of the future implementation of gamified features. Therefore, we suggest that further studies be undertaken which investigate how such temporal differences in implementation, affect the technology acceptance (Davis, 1989) of gamified features.

Trading services can be seen to have patterns of sporadic use, where users log in to carry out pre-meditated searches for offers and to list their own goods or services. Gamification and badges on the other hand, rely on persistence. Badges are reputation indicators and rewards that persist in the users' profile as a social indicator. However, in the larger context of the use of such services, their role might not be significant enough to fundamentally change the way these services are being used. It is conceivable that if the use of a service or a system is sporadic, then gamification might not be seen to hold enough value by the majority of users. The sporadic nature of such services also means that there are no peers who actively use the service for hedonic or social purposes, and therefore the role of those aspects related to social comparison (Festinger, 1954) are diminished.

In the game context, badges seem to be a notable vessel for players' goal-oriented and social behaviour. For instance, along with the publication of the first-person shooting game, *Battlefield 3*, EA Games also published a web service solely for monitoring and comparing player activity and badges. On the Xbox game console, every game publisher is required to implement badges in their games. In addition, it has been found that games with badges receive better ratings (EEDAR, 2007). Therefore, it seems that the effectiveness of game elements depends upon the nature of the service in which they are used, as well as the intentions and use scenarios of the user. The reason why people use different services can differ greatly between services of a different nature (van der

Heijden, 2004). Therefore, game-related mechanics might provide little benefit in respect to the usage considerations of utilitarian services. This suggests that the gamification of completely utilitarian services might be extremely difficult unless the gamification efforts are so thorough they manage to profoundly shift the use motivations of those system.

In the field of game studies, there are two main perspectives by which games (and therefore gamification) may be defined - systemic (Deterding et al., 2011) and experiential (see Huotari & Hamari, 2012). The systemic approach defines games based on what elements or mechanisms their system has, and therefore the addition of game mechanisms would (according to such an approach) transform services into games. However, the systemic perspective of gamification is in conflict with how we understand gameful experiences. Gamification often attempts to direct user or consumer decision-making towards choices that are desirable to a third party. Games themselves, however, attempt to do the opposite. Games create choice spaces that are separated from deeply consequential outcomes (Caillois 1961). The enjoyment of games emerges from mastering autonomous decision-making activity, regulated by free will (Avedon & Sutton-Smith 1971, Ryan et al. 2006), rather than enjoyment that is derived from the outcomes of that decision-making. In the same vein, Huotari & Hamari (2012) proposed that gamification then refers to design that aims to bring about these gameful experiences. In common gamification implementations, goals are strictly tied to the consequential utilitarian activities of the service and thus can be seen to reduce autonomy of a user. According to game theorists, this is a conflict that might negatively affect the general attitudes of users toward such an implementation. Therefore, we suggest that further studies be undertaken which measure the attitudes of users towards artificially assigned badges awarded for demonstrating certain behaviours within the service.

This conflict is also connected to a further issue. If we accept that gamification is, as the name suggests, about creating gameful experiences, and not just about directly changing behavior, then the successfulness of gamification should also reflect the user experience (see Huotari & Hamari 2012). Although, we may hypothetically find that gamification increases the retention of users and other usage activities, it would still be unknown whether users experienced any gameful or playful experiences. Therefore, further studies might focus on the experiential aspects of such engagement, such as perceived enjoyment (van der Heijden 2004), flow (Csikszentmihályi 1990) and playfulness (Webster & Martocchio, Webster & Martocchio, 1992; Martocchio 1992, Martocchio & Webster 1992) and intrinsic motivations altogether (Deci & Ryan 1985).

6.3 Practical implications

The conceptual part of this dissertation highlights the essentiality of the psychological aspects of gamification, running contrary to other definitions and conceptualizations. As a practical implication, this thesis suggests that merely focusing on the design elements and behavioural outcomes in gamification, dras-

tically limits gamification in several ways. First of all, while the goal of gamification commonly pertains to changing user/customer behaviour, in gamification, psychological factors are crucial aspects that mediate the effects of gamification and behaviour change. Without understanding those factors, there is no way for the developing party to really understand the forces which drive gamification. Another implication from the definition that has been offered in this work, is that while other definitions have highlighted the use of 'game design' in gamification, we question this approach because focusing on existing games and game design patterns as the inspiration for motivational design could limit the available choice of different design techniques.

The conceptual work in this dissertation points to a paucity in the concepts which ground how games and gamification have been initially defined, and this raises questions as to whether a precise definition is even feasible. Ultimately, defining *gamification* seems to depend upon the definitions of games.

According to the results presented in this dissertation, social factors are also essential for the gamification of a service, and have often been implemented as affordances that support social interaction (Zhang 2008; Huotari & Hamari 2012; Hamari & Koivisto 2013). From a managerial perspective, these empirical findings imply that in the context of gamification, it is essential to take into account the importance of having a community of people who are committed to the goals that the gamification promotes. The findings of the dissertation suggest that in order to support the adoption and use of gamification, the process of social influence should be harnessed in the design as follows: 1) affording features that enable the users/community to signal norms within their community (enabling the diffusion of norms). 2) Providing features that afford users to communicate or make visible their behaviour related to accepting the social influence (such as sharing functions and badges - see Zhang 2008; Hamari & Eranti, 2011; Hamari, 2013; Montola et al. 2009). 3) Providing features (such as "liking" and commenting) that enable users to give feedback on other users' activities (enabling recognition and thus supporting relatedness for emergence of intrinsic motivations). 4) Supporting continued social interaction within the IS, in order to enable sustainable group formation and cooperation (positively influencing the formation of reciprocal benefits). 5) In order to strengthen suggestions 1-4, IS/gamification design would benefit from further enabling users to interact with new users, in order to grow their relevant community within the IS. Our findings suggest that the size of the relevant peer-group within the IS further promotes all of the aspects of social influence. Furthermore and especially in the context of gamification, the diffusion of norms is likely to promote goal commitment toward goals in the system (Locke & Latham, 1990), and commitment toward common goals is likely to be an important antecedent for successful gamification.

The Sharetribe service (in Study 4) represented a typical start-up looking to grow customer engagement via gamification (Zichermann & Cunningham, 2011). The experiment conducted in this dissertation well emulates a typical scenario where gamification is implemented into a relatively new service with a relatively small initial user base. As discussed previously, we found that only a

relatively small portion of users became interested in badges and therefore we were unable to find support for the hypotheses which pertained to the question as to whether the mere implementation of gamification is effective in encouraging overall user behaviour. A probable explanation for failed gamification implementations in general (see e.g. Gartner, 2012) can stem from the lack of interest towards such mechanics, when the user motivations are otherwise extrinsic to the service itself, such as selling ones belongings. However, we did find that for those users who actively monitored their own badges, their usage activity was also higher. This suggests that in a large service with a larger user-base, gamification can be effective since it will affect at least some proportion of the users.

6.4 Limitations

Certain limitations should be considered within this dissertation. Concerning the qualitative-conceptual approach selected (especially in Study 1), this can potentially limit the breadth of observations since the set of observed games is naturally limited, thus leading to a balancing act between depth and breadth. While the study might not cover all the possible approaches to marketing through game design, the qualitative data can still support the main contribution of the study which is a more abstract observation on the use of game design as a marketing tool, and which has functioned as one of the precursors for today's gamification developments.

While this dissertation sought to reduce the conceptual scantness of gamification (study 2), more work needs to be carried out in order to accurately pinpoint what gamification is as a conceptual artefact. As discussed in the second section of the dissertation, the vagueness in defining gamification rests on the ambiguity of the other terms through which gamification is constructed; especially that of *games*. Games are pervasive, complex and exceedingly manifold systems, and the psychological phenomena around games is equally as wide. If gamification refers to the implementation of mechanics derived from games as a means to invoke (positive) psychological states which are characteristic of games, then there are large sets of factors that would fit within the definition of gamification. Moreover, there do not seem to be many unique mechanics in games to begin with. It is rather the systems' overall ensemble and dynamic with its users that ultimately brings about the desired outcomes. These complexities may lead into a situation where 'gamification' loses its conceptual utility beyond its value as an anchor word that has managed to arouse the popular interests among scholars and practitioners.

Concerning study 3, as is commonplace with studies conducted by online survey, the data is self-reported and the respondents are self-selected. Using self-reported data may affect study findings as those users who respond are potentially more actively engaged with the service, and therefore are more willing to participate in activities related to it. Thus, any results may disregard the perceptions and intentions of less active and unengaged users of the service. These could be addressed in future studies, as well as the reasons why users do not

become involved in the service. Future research should combine survey data with actual usage data, as well as conducting targeted experiments to increase the robustness of research on the topic.

The empirical studies in this dissertation were naturally conducted in specific contexts. While there are no obvious a priori reasons to expect that the context of gamification would have a clearly direct effect on the results, it is feasible that the results might be somewhat context-dependent. In Study 3 the context is voluntary and self-directed, and aimed at motivating users towards an activity that individuals often have difficulties carrying out without support. In this context, gamification can be perceived as method of self-help. Furthermore, users of the service have decided to use the gamification service when registering to the service, aware that the core value of the service was related to gamification. In the case that the gamification would have been imposed on users at a later stage of their usership, then the results might be different. For example, in Study 4 the gamification was implemented within an existing service and the users had obviously registered without prior knowledge of the gameful interaction to come. Furthermore, the e-commerce service in the study presents a highly utilitarian service where users are presumably acting in a rather cognitive-rational mindset, since the main activities of the service are economic transactions. Other possible lines of research could compare the same intervention across different contexts, for example depending on the nature of the underlying service, utilitarian versus hedonic, and also how the cognitive/affective involvement of the user affects how gamification is perceived. The effects of temporal differences in the implementation or removal of gamification could also be investigated.

Research has also demonstrated individual differences in how benefits from gamification may be perceived (Koivisto & Hamari 2014). Therefore, further research could also consider the effects of differences in personality and, for example, player types on use and experiences gained from gamification. Furthering this line of research could refine the understanding of moderating demographic and user related factors.

6.5 Conclusion

In summary, this dissertation sought to address both the theoretical and empirical gap related to gamification. From the theoretical perspective, this dissertation presented two studies in which gamification was conceptually linked to IS/marketing theory. The first study linked marketing literature with observations drawn from actual games on how game developers use game mechanics in their services as means of marketing (Study 1 - *Game design as marketing: How game mechanics create demand for virtual goods*). The second conceptual study formed a definition of gamification, arrived at by triangulating theories taken from game studies, motivational psychology, service marketing and IS/HCI (*Defining Gamification - A Service Marketing Perspective*). To investigate the empirical gap, this dissertation presented two studies. The first empirical study investigated what (social) benefits and motivations drive the continued use of gamification services (*Social motivations to use gamification: an*

empirical study of gamifying exercise). The second empirical study presented a 1.5 year long field experiment on the effects of gamification on user activity and retention (*Transforming Homo Economicus into Homo Ludens: A Field Experiment on Gamification in a Utilitarian Peer-To-Peer Trading Service*).

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Game design as marketing: How game mechanics create demand for virtual goods

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Abstract

Selling virtual goods for real money is an increasingly popular revenue model for massively-multiplayer online games (MMOs), social networking sites (SNSs) and other online hangouts. In this paper, we argue that the marketing of virtual goods currently falls short of what it could be. Game developers have long created compelling game designs, but having to market virtual goods to players is a relatively new situation to them. Professional marketers, on the other hand, tend to overlook the internal design of games and hangouts and focus on marketing the services as a whole. To begin bridging the gap, we propose that the design patterns and game mechanics commonly used in games and online hangouts should be viewed as a set of marketing techniques designed to sell virtual goods. Based on a review of a number of MMOs, we describe some of the most common patterns and game mechanics and show how their effects can be explained in terms of analogous techniques from marketing science. The results provide a new perspective to game design with interesting implications to developers. Moreover, they also suggest a radically new perspective to marketers of ordinary goods and services: viewing marketing as a form of game design.

Keywords: online games, social networking, virtual world, virtual goods, business model, sustainability, captology

1 INTRODUCTION

Selling virtual goods has become a major new revenue model for consumer-oriented online services, social networking sites, massively-multiplayer online games (MMOs) and virtual worlds in particular. This is especially true in the East Asian market. In September 2005, 32% of titles surveyed by Nojima (2007) in Japan used virtual item sales as their main revenue model. In October 2006, the share had grown to 60%. The global volume of real-money trade of virtual goods was estimated at 2.1 billion USD per year in 2006 (Lehtiniemi & Lehdonvirta 2007). This dramatic rise of the virtual good model arguably merits increased attention from the disciplines of marketing and technology management.

In practice, the so-called virtual good sales or microtransactions revenue model involves selling some form of virtual items, “avatars” or currencies to the users of an online service. Perhaps most frequently, the object sold for real money is a virtual currency, which is then exchanged for virtual items. The items can range from weapons and armour in online games to clothes in virtual worlds and simple two-dimensional graphical badges in social networking sites. The items are used as part of gameplay or to fulfil similar social and aesthetic functions as physical commodities are used for elsewhere in consumer culture (Lehdonvirta, Wilska & Johnsson 2009).

In this paper, we consider the question of what leads consumers to purchase virtual goods. Previous studies on the topic mostly focus on the consumer, considering what motivations and decision processes lead individuals into purchasing virtual goods (Guo and Barnes 2007; Lehdonvirta 2005; Nojima 2007; Lehdonvirta, Wilska & Johnsson 2009). We adopt a different, complementary approach, focusing on how the rules and mechanics that developers build into their MMOs lead to virtual good purchases. Our theoretical perspective is based on marketing: we view game design as one aspect in the company’s marketing process that aims to create demand for virtual goods that can be sold for real money. This way, we are able to offer new explanations as to how certain designs and patterns create demand and to suggest designs that could still be explored further. Moreover, learning can happen in the other direction as well, from game design to marketing. Insights built into game designs, based on the collective experience of generations of game designers, can potentially teach traditional marketers new things about how people’s behaviour is shaped.

In the second section of this paper, we discuss the virtual good sales revenue model in more detail and review related literature. We also provide a review of basic marketing literature that acts as a conceptual framework for the rest of the discussion. In the third section, we outline the research design of the empirical part of this paper. In sections 4 and 5, we present empirical analyses of design and game mechanics in a number of MMOs. In section 6 we summarise the results, and in the final section, present conclusions and discuss the implications and limitations of the study.

2 BACKGROUND

2.1 Virtual Good Sales As a Revenue Model

Real-money trade of virtual goods first emerged in 1999 in the form of player-to-player trade in MMOs such as *Ultima Online* and *EverQuest*. Users would list their hard-earned game possessions on eBay and let other users bid for them (Lehdonvirta 2008). In recent years, the growth of the market has increasingly been driven by operators selling goods directly to their users. Instead of requiring users to pay a monthly subscription fee, operators allow users enter the service for free, with the expectation that some users will nevertheless spend money on virtual good microtransactions (Nojima 2007). For this reason, virtual good sales-based games like *MapleStory* are occasionally called “free-to-play” games. One example of a virtual world that follows the same model is *Habbo*. *Second Life* follows a similar but more complicated model, where users are the primary actors in virtual good production and sales.

Successful subscription-based MMOs charge around \$10-\$15 per month from their users, while Liew (2008a) estimates that successful “free-to-play” operators earn around \$1-2 in monthly ARPU (average revenue per user). The estimate is based on figures pertaining to *Second Life*, *Club Penguin*, *Habbo* and *RuneScape*. Korean-based *MapleStory* is estimated to have a monthly ARPU of \$20 in the United States (Liew 2008b), while Hyatt (2008) estimates the average ARPU of “free-to-play” titles being around \$5 per month. At first glance it would therefore seem that the subscription model is often the more attractive option, but if we consider other metrics such as registered users, active users, conversion rates and costs, the situation may change. Users that are willing to pay a subscription fee belong to a fairly limited segment of hardcore users, while “free-to-play” services have the potential to court much larger audiences.

For these and other reasons, operators are increasingly applying the virtual good sales revenue model in virtual worlds, MMOs as well as other online services. Understanding how to create and maintain demand for virtual goods is therefore an increasingly pertinent question. How does a service entice users into virtual good spending? How can sales be sustained over time without saturating the demand? To begin answering these questions, in the following part we review relevant literature from MMO related studies.

2.2 Understanding Virtual Good Purchases

In the academic literature pertaining to MMOs, the majority of works focus on fascinating legal and philosophical questions that virtual worlds and real-money trade of virtual goods give rise to (e.g. Fairfield 2005; Lastowka and Hunter 2004). Works that deal with virtual goods from a business perspective are relatively scarce.

MacInnes (2004) and Lehdonvirta (2008) discuss different approaches that MMO and virtual world operators can take towards real-money trade of virtual goods on a strategic level, without going into detail about what creates demand for the virtual goods. Nojima (2007), Lehdonvirta (2005) and Guo and Barnes (2007) focus on the individual user, examining motivations and decision processes that lead into virtual good purchases. Nojima (2007) examines relationships between the revenue models and players' motivations for play. The motivations are based on a model by Yee (2005). Nojima finds that players who buy items report higher levels of immersion in a game. One explanation offered is that it takes a certain amount of immersion before virtual objects begin to feel desirable enough to purchase. Using a similar approach, Lehdonvirta (2005) examines different motivations that players have for purchasing virtual goods: advancement in a status hierarchy, advantage in competitive settings, keeping up with co-players, experiencing new content, customisation, and self-expression, among others. According to Lehdonvirta, users' attitudes towards virtual good purchases are linked to their general motivations for participating in the service and the activities they engage in. Guo and Barnes (2007) use a technology acceptance model in developing a preliminary model for virtual good purchase acceptance.

Lehdonvirta (2009) approaches the question of why people buy virtual goods from the point of view of attributes pertaining to the goods themselves. Lehdonvirta categorises these attributes to functional, hedonic and social attributes. Lehdonvirta, Wilska and Johansson (2009) examine "virtual consumption" from a sociological perspective, documenting the way in which virtual goods are used as social markers to draw distinctions between "haves" and "have-nots" and to build and communicate self-identity to other members of the community.

Table 1: Explanations offered for virtual good purchases in previous literature

<i>Work</i>	<i>Perspective</i>	<i>Explanations offered</i>
Lehdonvirta 2005	individual/psychological	(various)
Nojima 2007	individual/psychological	high immersion
Guo & Barnes 2007	individual/psychological	psychometric model
Oh & Ryu 2007	game design	(various)
Lehdonvirta 2009	virtual item attributes	functional/hedonic/social
Lehdonvirta, Wilska & Johansson 2009	community/sociological	social distinctions, identity, self-expression

The different approaches to understanding virtual good purchases in previous literature are summarised in Table 1. Most studies adopt the individual user as their unit of analysis, focusing on the individual's motivations and decision processes that lead into virtual good purchases. In contrast, Oh and Ryu (2007) examine ways in which game design can successfully accommodate and enhance virtual item sales. Based on observations from two Korean online games, *KariRider* and *Special Force*, they present examples of how design and game mechanics built by developers can be used to create and sustain demand for virtual goods; a fact fairly obvious to gamers but little explored in literature. Oh and Ryu's paper is a start in analysing these mechanics, but it lacks ties to any previous body of knowledge that could be used to put the observations in perspective. In the following part of this paper, we outline a perspective from marketing that can be used to examine efforts aimed at promoting virtual good sales.

2.3 A Marketing Based Approach

Traditional authorities in marketing emphasise that marketing is about identifying and meeting human and social needs (Kotler and Keller 2006; Drucker 1993). In the ideal case, marketing results in a customer who is willing to buy. Thus the aim is to understand the customer (Drucker 1993). On the

other hand, marketing can also be seen as an activity that *creates* needs. This view is particularly pertinent in the context of MMOs, where designers create the rules and mechanics that determine to a large extent the activities and specific needs of the participants.

In traditional marketing activities, products are offered in an already-existing market and customers are segmented mostly based on existing segmentation attributes, such as socio-demographic variables. When designing a virtual world, its rules and internal economy can be regarded as marketing activities concerned with creating the underlying needs and conditions for customers to become incentivised to buying virtual goods. The design and creation of virtual goods can then be regarded as separate design iterations that address the needs created in the previous stage (see e.g. Stabell & Fjeldstad 1998 and Porter 1980 on value configuration). This sets value creation through virtual goods somewhat apart from traditional marketing, as the value for the goods has to be first created through designing the context for the goods. Next we will present some examples of value creation from traditional marketing science that will be linked with game design patterns in the next section.

Segmentation is one of the basic and central concepts of marketing. Its purpose is to identify and divide populations into strategically relevant homogeneous segments based on segmentation variables and customer needs. This enables companies to target their marketing efforts according to the defining attributes of the segment (Day 1981; Jonker et al. 2004; Kotler and Keller 2006). Segmentation in game design can be used in forming segments to which sell virtual goods to: for example, in-game classes and professions. Game design -derived player demographics have also been covered in literature (e.g. Bartle 1996; Bartle 2003; Yee 2007).

Differentiation is another basic concept in marketing. The aim of product differentiation is to attain higher desirability, and therefore promote sales, by being distinguishable from rival products (Kotler and Keller 2006; Sharp and Dawes 2001). Differentiation can take place in relation to a multitude of product attributes, but it can be divided into two general subsets: vertical and horizontal differentiation. Vertical differentiation refers to the differentiation of product attributes that are comparable to rival products' attributes. Horizontal differentiation refers to differentiation by offering a completely different set of attributes, as in a different product (Piana 2003; Vandenbosch and Weinberg 1995). Both of these dimensions will be further discussed in the context of game design.

In product life cycle management, the concept of *planned obsolescence* is particularly pertinent. It can be divided into two subcategories: 1) contrived durability and 2) actual planned obsolescence (Orbach 2004). Contrived durability refers to the intentional shortening of a product's lifetime in the production process, leading to quality deterioration. Planned obsolescence refers to an artificial shortening of a product's useful lifetime by means of fashion cycles or technological developments (Kotler and Keller 2006). The purpose of these strategies is to encourage customers to make repeated purchases and to enable sales to be sustained over a long period of time (Bulow 1986; Choi 1994; Orbach 2004). These strategies are interesting in the context of virtual items, since they are digital products: whatever their durability, it is always rather artificial.

Finally, various cognitive and psychological biases are frequently studied and exploited in marketing. Hsee et al. (2003) found that introducing points as a medium of exchange had a clear effect on people's behaviour in a setting where no effect should have been observed under an assumption of rational choice. According to the study, the medium caused an illusion of advantage, certainty and linearity and led test subjects to change their preferences and select the options that were originally less desirable. Subjects were willing to pay more effort when points were used as a medium between the effort and the outcome, compared to a situation with no mediating factor. These results are interesting, because most MMO operators use a virtual currency as a medium of exchange between real money and virtual items. Virtual currency as a medium also enables other psychological pricing possibilities, such as odd-pricing.

In summary, basic approaches in marketing include segmentation and differentiation on one hand, and a large variety of devices for enhancing the perceived desirability of purchases on the other hand. In the following sections, we examine how game mechanics and design patterns found in MMOs can be mapped to these marketing techniques.

3 DATA AND METHODS

This empirical part of the paper is based on an exploratory study of how existing MMOs, especially massively-multiplayer online role-playing games (MMORPGs), are currently creating and sustaining demand for virtual goods through their design and game mechanics. These design patterns and game mechanics are then compared with concepts and techniques outlined in the previous section to examine how design can be linked with marketing science.

Table 2: Games, virtual worlds and other online hangouts referenced in the study

Title	Publisher
Cyworld	SK Telecom, Korea
Entropia Universe	MindArk, Sweden
EverQuest	Sony Online Entertainment, U.S.
Habbo	Sulake, Finland
IMVU	IMVU, U.S.
KartRider	Nexon, Korea
MapleStory	Nexon, Korea
Puzzle Pirates	Three Rings, U.S.
Special Force	Neowiz, Korea
Travian	Travian Games, Germany
World of Warcraft	Blizzard, U.S.
ZT Online	Giant Interactive, China

The virtual good platforms referenced in the study are listed in Table 2. Most of the titles are performance-oriented games as opposed to socialising-oriented hangouts, which is somewhat visible in the scoping of our study. Many of the game elements analysed below are connected to performance-oriented game rules. A few of the above titles do not actually use the virtual good sales revenue model. They can nevertheless be equally informative cases, because demand for virtual goods exists and varies regardless of whether the operator harnesses it as a revenue stream or whether the demand is simply part of the internal mechanics of the game.

We studied each title through first-hand use experience and/or related literature and online materials. The data was collected during 2007-2008. We then analysed our observations with assistance from MMO design literature (Bartle 2003; Pardew et al. 2004; Alexander 2003, 2005) to identify generalisable design patterns and game mechanics that contribute towards creating or sustaining demand for virtual goods. In the following sections, we report the findings, examples from our observations and references to literature that were used as sources.

The selection of titles discussed in this study is based on their popularity, relative variety in mechanics and availability of information. This information-oriented sampling, as opposed to random sampling, is appropriate for exploratory studies and situations where depth of information is valued over breadth (Flyvbjerg 2006). No claim is made as to how representative the identified patterns are of virtual worlds and MMOs in general; only that such patterns have been used by designers in several cases. The actual identification and abstraction of relevant design patterns and game mechanics from the cases is necessarily a somewhat subjective step, although grounded in design and marketing literature.

4 SEGMENTATION AND DIFFERENTIATION – CREATING NEEDS ON MULTIPLE DIMENSIONS

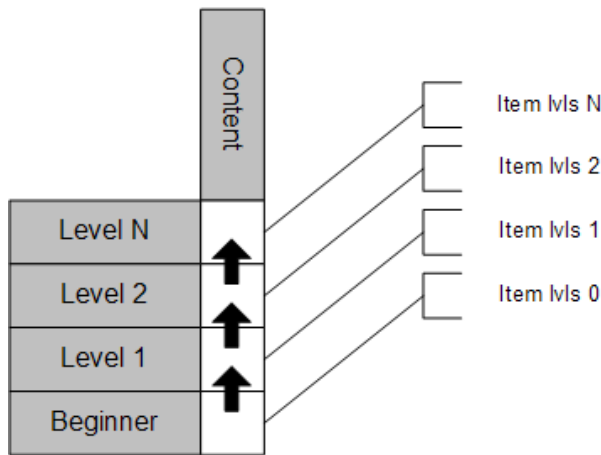
While segmentation itself does not make products more desirable to customers, it enables identification of strategically relevant customer groups and enables differentiation of products to address the needs of customer segments, resulting in more desirable products (Day 1981; Jonker et al. 2004; Kotler & Keller 2006). This section focuses on how MMO design can generate and enforce user segments and create targeted offerings for them.

Companies offer different products according to customers' usage rate and status, which are behavioural segmentation variables (Kotler and Keller 2006). For example, an amateur might require lesser products than a professional. This enables companies to sell new products as a customer's skill or interest increases. In the real world, an amateur might directly buy the high-end products and thus bypass the entry-level products. Alternatively, a consumer might settle for the entry-level products and leave higher quality products on the shelves.

4.1 Stratified content

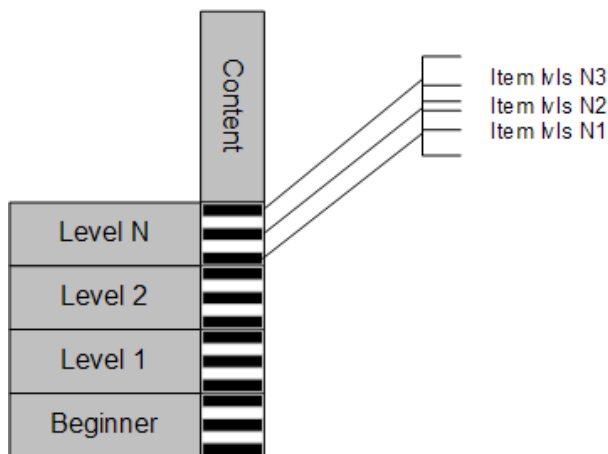
Usage rate and status in MMOs is typically reflected in stratified content (Figure 1). The most common example of this is found in MMORPGs, where a player's avatar starts from level one and gradually through gameplay progresses through the game content and gains levels, rising in status. This mechanism can be used to segment players vertically and then differentiated items can be targeted accordingly.

Figure 1: Content stratification based on avatar levels



In practice, while most users progress through stratified content, the segments might not be as clear cut. Users go through the content with differing time investments and thus it might be reasoned to offer even more differentiated items in smaller increments as players are differently price sensitive and have varying amounts of time at their disposal. The levels represent a game design -derived segmentation, whereas differentiation within these level tiers (black blocks in Figure 2) addresses users' real-world behavioural segmentation attributes. For example, in *World of Warcraft* there are items of several quality rankings inside each level tier (Figure 2), which can be seen as addressing sub-segments within each tier that invest differing amounts of time in the game. The degree of vertical differentiation is determined by the operator according to its business strategy.

Figure 2: Differentiation within levels



4.2 Status restrictions

Programming status restrictions into items is one way of enforcing the differentiation of items. This way, the operator forces players to obtain new items iteratively if they wish to maintain the same relative performance or status. This mechanism could be compared to regulations in karate belts, which can officially be worn only when the karateka has achieved the appropriate status. A karateka iteratively progresses through the different skill stages and has to purchase a new belt on every stage.

Status restrictions in items also bear a resemblance to contrived durability, as the restrictions are designed into the products themselves. On the other hand, it also has similarities to planned obsolescence, as the players' progression in the game gradually renders old items useless.

Vertical status restrictions have been implemented in at least two ways: 1) an item cannot be used if the avatar's level is too high (e.g., *ZT Online*), and 2) an item cannot be used if the avatar's level is too low (e.g., *World of Warcraft*). This way, the avatar has a sliding window of usable items at a given time depending on the avatar's level, thus iteratively directing buying behaviour. According to Davis (2007), in *ZT Online* players essentially have to renew their inventory every five levels. Status restrictions are also implemented horizontally, e.g., via avatar type restrictions, offering goods that are only usable by a certain avatar type.

Online hangouts such as *Cyworld* and *Habbo* lack explicit level systems, but similar item tiers could perhaps be designed around more socially oriented measures. For example, in many services participants either implicitly or explicitly compete for fame. In *MapleStory*, there are explicit lists of "most famous" players.

4.3 Increasingly challenging content

Content that gradually turns more challenging is a design pattern that has many of the same implications as status restricted items, discussed above. The difference is that the measures implemented are directed towards the game environment, avatar, and rules. When the game content becomes increasingly difficult, it requires the user to obtain better items to maintain the same relative level of performance or status, as old items gradually become useless. Thus the operator is able to differentiate items in terms of quality and item effectiveness in differing content difficulty. This is a very common game design pattern and is implemented in almost every MMO, but rarely as a marketing device to support virtual good sales.

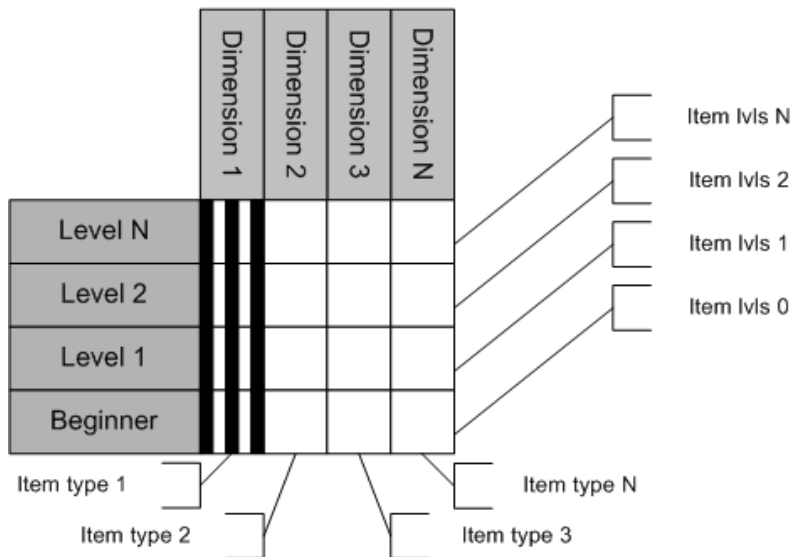
In other types of services, the concept of "game content" is more ambiguous. In socially-oriented online hangouts, gameplay could be understood as the user-to-user interactions aimed at establishing social distinctions and hierarchies. For example, in *IMVU*, participants rate each other "cool", "smart", "fun", "hot" or "lame". The difficulty of the "competitive gameplay" thus depends on other users and their behaviour. Introducing explicit measures in this way might further help the operator in identifying segments and selling items accordingly.

4.4 Horizontal gameplay

While the mechanics discussed above enabled vertical segmentation and differentiation, horizontal segmentation is an equally important marketing device. In MMOs, horizontal segmentation is achieved via multiple content or gameplay dimensions (e.g., performance-oriented, socialising, trading), which can be used in designing differentiated virtual goods that are mutually non-rivalrous and not explicitly comparable. The dimensions can be further divided into smaller horizontal modes of play. For example, performance-oriented content might require the user to have several types of items to address varying needs derived from content; social status of an avatar could be rated on multiple scales (e.g., *IMVU*, see black blocks in Figure 3). Such dimensions must have meaningful content, however; otherwise they risk being seen as blatant profiteering.

For example, a simple form of horizontal differentiation is offering many types of avatar clothing (e.g. shirts, trousers, vests), which are not mutually rivalrous. These can then be seen inside a larger horizontal dimension covering gameplay concerned with avatar clothing in general. For example, in *MapleStory*, it might not be well reasoned to add more clothing categories for the avatar itself, but the addition of *pets* creates another meaningful context for offering more (pet)clothes for sale.

Figure 3: Horizontal dimensions of content



In Figure 2 and Figure 3, the dimensions are simple examples from actual implementations. In practice, the design of vertical and horizontal dimensions is specific to each MMO: there are no fixed sets of dimensions. There are no explicit limits on how many nested dimensions can be designed, but it considerations of usability, compelling gameplay and business strategy that set practical limits.

4.5 Avatar types

While segmentation and differentiation can be achieved through game design patters presented above, a further overarching way of creating segmentation is avatar types. Most performance-oriented MMOs have avatar “classes”, which determine avatars’ core competencies, items they can use, and their play style in the gameworld. In more socialising-oriented MMOs, appearance-related avatar attributes such as gender, hair colour, and style might be more relevant avatar-defining attributes.

In terms of Figure 3 above, avatar types can be said to create avatar-specific gameplay dimensions. Additionally, avatar types are implemented to further create nested segments inside larger segmentation blocks. For example, for slaying monsters in a MMORPG, a hunter might require a bow, whereas a mage requires a magic wand. This way, avatar type is one of the determinants of differentiation of virtual goods.

In essence, designing avatar types and attributes is equal to designing game-based behavioural and demographic segmentation factors. Whereas in traditional marketing, independent customer attributes are examined to segment customers into strategically relevant groups, the design of avatar attributes is actually a process of deciding and forming some of those factors beforehand. This is not say that real-world segmentation factors would not apply, but both have a role in determining and creating user segmentation and differentiation of virtual goods.

5 MECHANICS THAT DRIVE DESIRABILITY OF VIRTUAL GOODS

5.1 Item Degradation

In some virtual worlds, virtual items *degrade* with time or usage, sometimes to the extent of vanishing completely. In performance-oriented MMOs such as *World of Warcraft* and *EverQuest*, item degradation by use is frequently implemented by items degrading due to combat. Items may also degrade gradually with time, or alternatively, item can have a set expiration date after which they vanish or become useless (e.g., in *Puzzle Pirates* and *MapleStory*). Items vanishing can also prevent “rich” players from giving items away to “poorer” players and thus encourage players to purchase

items by themselves. Item degradation through destroying items or by rendering them useless creates the possibility of selling replacement items over and over again. In marketing terms, degradation is closely analogous to contrived durability, as the operator controls exactly when and how the item ceases to function or exist.

Unlike with material goods, there is no technical reason why virtual items could not last indefinitely, so the marketer may have to justify why such a mechanism is implemented. Degradation through usage is easily justified in terms of the background fiction in performance-oriented MMOs such as *World of Warcraft*. Items usually break gradually when used in combat. Repairing costs currency, which can also be harnessed as a revenue stream, as is done by the operator of *Entropia Universe*. In online hangouts such as *Habbo*, item degradation is more difficult to implement in a way acceptable to users. In these contexts, degrading could perhaps be justified using more mundane scenarios such as items becoming dirty and requiring washing.

One way of implementing item degradation is to have “charges” in items, that is, setting a limit to the number of times an item can be used. This is often the case with consumable items. For example, a player can drink from a magic potion five times. Consumable items can have many purposes for players in a given game or service. For example, in *World of Warcraft*, there are many performance-enhancing consumables. In *MapleStory*, players can purchase a wide variety of performance-enhancing and functional consumables, such as a bonus that prevents players from losing experience points when killed. Time-based degradation is used in *Cyworld*, a socially oriented online hangout.

Habbo does not use degradation at all. As a result, some users have accumulated massive amounts of items in the service, and it is not unheard of for older users to give away substantial goods to new users for free, essentially cannibalising the operator’s sales. On the other hand, very old items that are no longer available for purchase have become highly valued content among *Habbo* users. Lack of items with interesting histories and provenance (Lehdonvirta 2009) is a drawback of services utilising the degradation model.

In summary, degradation works in the same way as contrived durability, forcing customers to buy replacement products after a certain time. On the other hand, rational players should factor potential degradation into their value assessment of a new good, lessening its appeal. Implementing degradation is thus essentially an optimisation problem between initial sales potential and sustained sales potential, with game mechanics and background stories being applied to nudge players’ economic reasoning towards the desired outcome.

5.2 Inconvenient Gameplay Elements

Several free-to-play MMO operators sell user interface (UI) enhancements to generate revenues. This implies that some gameplay or interface elements have been intentionally designed to be somewhat inconvenient, at least from the point of view of an advanced user. The enhancements range from actual virtual items to non-item power-ups and UI upgrades. Some services provide additional advantages over other players, others merely ease the use of UI. Below, we discuss a few examples of such implementations.

A “Travian Plus” account in *Travian* provides users with several UI and performance enhancements. For example, users can make shortcuts to more easily manage their civilisation. Other purchasable user interface enhancements include a larger map view, construction queues, information sorting and statistics. In *Special Force*, a Korean first-person shooter game, the default colour of the weapons’ crosshair can be difficult to recognise on some backgrounds. To address this inconvenience, players can purchase new crosshairs (Oh and Ryu 2007). In *MapleStory*, there is only limited space available for storing friends’ contact information. Once the limit is reached, users have to buy more “friend slots”. *MapleStory* also sells avatar facial expressions to help players communicate in more varied ways.

The virtual landscape of many MMO worlds is so large as to make travel between places time-consuming. In most MMOs, distance is countered by teleportation or other instant means of travel. These instant travel mechanics can come with a price. In many games, such as *World of Warcraft*, they are paid using in-game money. In *MapleStory*, some travelling requires a currency that must be purchased with real money.

Gathering “loot” left behind by vanquished enemies is a common mechanic in MMOs. For high-performing players, it can become a significant inconvenience factor, as it takes time away from “productive” gameplay. In *MapleStory*, a pet can be taught to collect loot for the player, but the ability costs money. Limited storage space for items is a related inconvenience factor that will be discussed further below.

Operators might also seek to take advantage of the always-on nature of virtual worlds, and the fact that players have limited time to be online. In *MapleStory*, users can buy an automated merchant

character that will conduct trade on their behalf while they are offline. Players' scarce time resources are also harnessed as a business opportunity by the so-called secondary market service providers that offer unsanctioned "power levelling" services and virtual currency sales in MMORPG games.

Unlike many other game mechanics that can be compared with marketing techniques, many of the inconvenient gameplay elements are clearly intentional parts of the design from the start, implying that they are understood as a form of marketing by the developers. A game-specific need is created, to which a virtual good that addresses the need is offered as a solution. In marketing terms, this is similar to how a generic product might be sold with certain limitations, to which augmenting products are offered as a solution.

5.3 Mediums of Exchange

In MMOs and other online hangouts, various points, credits and currencies are used as mediums of exchange in purchases and transactions, and also as rewards for accomplishments. In most free-to-play games, users first buy credits with which they buy the actual virtual items. Credits can also sometimes act as a status indicator and thus can be a desirable virtual asset themselves. In this section, we concentrate on the use of credits as a medium of exchange, and how they can be used to encourage demand.

Besides the possible economic-psychological advantages of virtual currency as medium (see section 2), a virtual currency also enables more pricing possibilities, allows the operator to sell larger amounts at a time compared to single items, and adds one more layer to maintaining the virtual economy. Operators can sell currency in amounts that are not quite divisible by the item prices. As a consequence, the users are left with change, which by itself is not sufficient for additional purchases, suggesting that the user should buy more currency. These tricks are used by most virtual item sales - based MMO operators examined in this study.

In *Puzzle Pirates*, two currencies are implemented to indirectly monetise otherwise non-paying users. This is achieved via two mutually tradable currencies, one of which is bought with real money and the other earned through gameplay. The rationale is that paying users will buy more of the paid-for currency in order to trade it for the earned currency, in order to be able to buy items which can only be purchased with the earned currency. This design could also alleviate perceived problems of unfairness relating to the use of real-money purchases that give gameplay advantages, because it allows both "money-rich" and "time-rich" users to access all goods through exchange.

5.4 Inventory Mechanics

In a typical MMO, users store their items in several types of inventories. Most commonly, users have separate spaces for items that are in use and for items that are in storage. One model is to have separate inventory categories for different types of items. Typically, all types of inventory slots are limited in number, which means that when obtaining new items, users might have to either dispose of some less needed older items or purchase additional inventory slots.

Limited inventory space is often used as a gameplay element, but it can also be a means to increase sales. In *MapleStory*, users store different item types to different inventories, which enables the operator to sell additional slots separately to each of the various inventory types. Buying four more slots to one of the inventories costs approximately 4 € in the European version of the game. Moreover, new inventory types can be introduced through gameplay. Virtual pets are a common example: they come with a set of empty inventory spaces for new clothing and other accessories.

Limited inventory slots have an obvious drawback from a sales point of view: a full inventory can prevent a user from buying more items. To make the disposal of old items easier to the user, the operator can offer to buy items back from the user for a fraction of the original purchase price in virtual money, or provide some other means of compensation. For example, *Habbo* contains a recycling machine where users can exchange 20 old items (originally purchased for real money) for a single new item.

5.5 Special Occasions

Christmas, Halloween, birthdays and other special occasions have been actively used by virtual world operators to promote virtual item sales. Occasions that traditionally provoke buying behaviour are simulated and referenced so that the same effect may be achieved in the virtual setting. For example, Christmas and Valentine's Day are used in services such as *Habbo* as they encourage gift giving and offer a natural context for selling new types of items. This strategy can further be extended to birthdays of users and their avatars, a technique used in some social networking sites.

World of Warcraft has an event calendar containing all in-game events, such as competitions. It also includes traditional seasonal occasions, which are usually modified slightly to better suit the lore

of the game. For example, winter holidays are named “Feast of Winter Veil” and Halloween is “Hallow’s End”.

Besides real-world occasions, operators can also create their own special occasions based on the fiction of the game. One major example of a fiction-based special occasion was the release of the “Ahn’Qiraj” dungeon in *World of Warcraft*. Blizzard Entertainment designed several quests that required a server’s population to collect millions of items to open the “Gates of Ahn’Qiraj”. Ostensibly, the main motivation for players to collect all the items was to progress in the game faster, as the Gates were to be opened later in any case. This event caused the player populations of many *World of Warcraft* server clusters to organise co-operative attempts to amass all the required items, even before the quests were actually released into the game (WoWWiki Contributors 2009).

5.6 Artificial Scarcity

Scarcity is a common strategy in traditional marketing. It has been used as an indicator of high quality and thus to justify premium prices (Kotler and Keller 2006). Another way of utilising scarcity without sacrificing sales quantity is to create an illusion of it through marketing communications. In essence, this means giving customers the impression that the product is almost sold out when it is in fact not, a common if somewhat questionable marketing technique. A perception of scarcity can also be achieved through exclusiveness, making a product in one way or the other challenging to obtain without necessarily altering the price.

In *Habbo*, some items exist in abundance while others are circulated in very small quantities. For example, a limited number of DJ style record players were distributed for free by Sulake in 2002 as part of an advertising campaign. In 2006, users were trading them for around 250 “Plastyk”, which equals a re-purchase cost of approximately 200 € (Lehdonvirta, Wilska & Johansson 2009). Considering that the record player cannot actually play music, it is no different functionally from many other much less valuable items. Thus a large part of the record players’ high value can no doubt be attributed to its scarcity.

Around mid-2006, the *Habbo* record player was again distributed as part of a new promotion (ibid.). This multiplied its supply on the user-to-user marketplaces, leading to a drastic decrease in its price and the prestige associated with owning one. As a consequence, its position as a top luxury good was taken over by other items, and status-conscious users had to purchase new items to maintain prestige.

Sulake also introduces collectible items, which are sold only for a limited time. This time varies from few hours to weeks. Sulake suggests that buying these items is an investment, saying that their value will rise as the same item will not be sold again after the limited sales period is over (Sulake Corporation 2009).

In most performance-oriented MMOs, scarcity is more commonly achieved by making certain items difficult to obtain through gameplay. Most commonly, these rare items drop from slain monsters. Either the rate at which the rare items are dropped is small, or the monsters that have to be slain are hard to come by and slay. These items are most commonly not purchasable and thus do not represent a revenue stream to the operator. However, users may well be incentivised to spend money on purchasable items that help them to reach the rare and desirable items. An example is found in *ZT Online*, where players use real money to buy keys that are used to open boxes dropped by slain monsters. Opening a box is designed to be similar in experience to a slot machine: superior items are shown to the user, but rarely given. The implementation thus also has elements of gambling. There is moreover a ranking of players who have opened most boxes on a given day. This ranking can be regarded as another horizontal gameplay dimension, where the ranking provides the competitive context that encourages players to keep buying the keys.

5.7 Alterations to Existing Content

One way of addressing the long-term attractiveness of an MMO and the items sold inside it is to introduce regular updates and to add new, meaningful content. At the same time, the new content devalues the existing content and items, hence making the new content and items more desirable to obtain. Updates are also used to fine-tune game rules to keep the game and its internal economy in balance.

The underlying design and rules are not perceived as intentional alterations to the service and can be more easily incorporated to the game lore, thus supporting user acceptance. On the other hand frequent upgrades are necessary to address promotional needs and in-game balance issues. Therefore, the operator might actively seek to adjust rules, items and environment, or arrange events to promote new or seasonal items. For this reason, it is important to design the initial mechanics and platform carefully and flexibly to facilitate further updates.

In traditional marketing, it may be difficult to modify tangible elements of a product after a customer has already purchased it. Virtual world operators have this possibility to some degree, but it is limited by user acceptance. This is especially the case with items that have been bought with real money, even if the modifications are necessary to balance gameplay.

Modifications do not have to be directed towards the items themselves to achieve the same effect. An item's functional effectiveness is a function of its potency as well as the game environment and its rules. By modifying the environment and the rules, the effectiveness of certain items or item types can be affected without touching the items themselves. However, despite the fact that operators have considerable power to make such adjustments, this power should be used cautiously. Modifying the specifications of a product that has already been sold simply for the reason of promoting additional sales may be ethically questionable if not illegal.

Alterations to existing content are commonly introduced through patches and upgrades, frequently rolled out by the developer. Upgrades or expansion commonly expand the gameplay by introducing new gameplay dimensions as well as building on top of the existing ones. In terms of the view introduced in Figure 3, upgrades are commonly implemented to add additional segment blocks vertically and horizontally, providing new contexts for differentiated goods to be sold.

6 SUMMARY OF RESULTS

The patterns identified in sections 4 and 5, above, can be divided into two categories. The first category consists of mechanics that in marketing terms create segmentation of users and enable differentiation of virtual goods; in other words, game mechanics that divide service content into differentiated contexts along vertical and horizontal lines, and in the process create a need for corresponding virtual goods. These mechanics are summarised in Table 3.

Table 3: Segmentation-related game mechanics that promote virtual goods purchases

<i>Design pattern</i>	<i>In marketing terms</i>	<i>Towards</i>	<i>Aims to</i>
Stratified content	Segmentation, differentiation	Rules, environment	Create segmentation, enable differentiation and generate incentives for repeated purchases
Status restricted items	Differentiation, planned obsolescence	Items	Enforce segmentation and generate incentives for repeated purchases
Increasingly challenging content	Segmentation, differentiation, planned obsolescence	Rules, environment	Enforce segmentation and generate incentives for repeated purchases
Multidimensional gameplay	Segmentation, differentiation	Gameplay	Create segmentation and enable differentiation and create differentiated additional settings for virtual goods
Avatar types	Segmentation, differentiation	Avatar	Create segmentation and enable differentiation

The second category includes mechanics that are used to create demand for virtual goods and encourage repeated purchases. Inconvenient user interface elements and similar gameplay factors have also been used as means to create need for complementary and value-added services that augment the core product. Special occasions related to real-world culture as well as to virtual world -specific contexts have been used in the seasonal promotion of virtual goods. These mechanics are summarised in Table 4.

Table 4: Other game mechanics that promote virtual goods purchases

<i>Design</i>	<i>In marketing terms</i>	<i>Towards</i>	<i>Aims to</i>
Item degradation	Planned obsolescence	Items, rules, environment	Create incentives for repeated purchases
Inconvenient gameplay elements	Core product -> Augmented product	User interface, gameplay	Create settings for additional virtual goods and services
Currency as medium	Psychological pricing	-	Create incentives for (repeated) purchases
Inventory mechanics	-	Items, avatar	Create incentives for repeated purchases
Special occasions	Promotional	Environment, items	Benefit from cultural patterns that encourage buying behaviour and create settings for additional virtual goods
Artificial scarcity	Exclusiveness	Items, environment, rules	Make selected virtual goods more desirable
Alterations to existing content	-	Environment, items, rules, gameplay	Create new settings for virtual goods to have value

7 CONCLUSIONS AND DISCUSSION

In this paper, we considered the question of what leads consumers to purchase virtual goods. Most previous studies adopt the individual user as their unit of analysis, focusing on motivations and decision processes that lead to virtual good purchases. We adopted a complementary approach, focusing on how the rules and mechanics developers build into MMOs encourage virtual good purchases. The theoretical perspective was based on marketing: viewing game design as one aspect in a company's marketing process aiming to create demand for virtual goods. We focused on performance-oriented gameplay elements in MMO games, as their gameplay conventions are quite established. Our objective was, firstly, to identify game design patterns that create and sustain demand for virtual goods, and secondly, to associate and compare them with analogous marketing concepts to obtain new insights about both game design and marketing. The identified patterns are summarised in the previous section. In this section, we discuss their implications for managers and policy makers, and consider potential directions for future research.

7.1 Game design as part of business planning

Based on the findings, we assert that game designers, by creating and modifying the rules and mechanics of the game, SNS or other online hangout, have an essential, but sometimes unrecognised role in planning the marketing of virtual goods. MMO operators are able to adjust the environment in which their products are sold and marketed, and the rules according to which the products are used, not to mention their role in creating the environment to begin with. This uniquely wide and flexible position the company occupies in the life cycle of the products requires a wide approach to marketing.

Even though virtual world operators have been forerunners in coordinating the efforts of game design and marketing, there still seems to be way to go before game design is harmonised with overall business logic. Many virtual world operators find themselves in a situation where revenue generation logic is distanced from the design of the service itself. If an operator was to change their revenue generation logic, it would also require drastic changes to the service itself. For example, *Chronicles of Spellborn*, operated by Acclaim Games, had to undergo a costly re-development due to a change of revenue model from subscription to free-to-play. One potential direction for future research could thus be found in examining how business models and service design, including game design, could be integrated and aligned from the start. As a first step, this could entail theoretical work that combines game mechanics with business model literature.

From a policy perspective, the findings of this study can be problematic. One cornerstone of media regulation in many countries is the conceptual distinction between content and advertising (although in film and television, this distinction has recently been challenged by product placement and multi-channel concepts). This study suggests that in games and online services that utilise the virtual good sales revenue model, it may be conceptually impossible to distinguish between "innocent" game

mechanics and content that has a marketing purpose. Some other rule than the separation of “content” and “advertising” may thus be necessary if commercial online services are to be regulated in the future.

7.2 Marketing as game design

An important conclusion that can be drawn from the results is that it is possible to see many traditional marketing techniques as the equivalent of game design patterns. From this perspective, the task of planning a marketing strategy for a traditional product or service could be approached as a task of creating a game design: a structure of choices, restrictions and incentives that engage the player-consumer in an interactive relationship with the product or service. Marketers already use terms and devices reminiscent of game design: progressions, levels, prizes, collectibles, memberships and points, among others. As game design patterns, these devices are not very advanced, however. Some problems with these real-life “marketing games” are arguably the following: the game is too simplistic, the game fails to engage for more than a short period of time, the game is too easy to provide excitement or too difficult to be rewarding, or the marketer’s commercial motive is blatantly obvious, preventing immersion in the game.

Our suggestion to marketing managers is, therefore, to approach the marketing task as a serious game design challenge: to hire professional game designers, to consult the large body of literature on game design, and to strive to create engaging games around their products and services. The whole customer relationship, from acquisition through retention to monetisation, could be modelled as an interactive game. This approach would be especially suited for businesses where customer interaction is mostly computer-mediated (including automatic telephone services) and the variety of possible interactions is restricted. On the other hand, businesses with face-to-face interactions and a complex variety of possible interactions could perhaps apply game design on a suitably abstract layer, and also make use of techniques and patterns in so-called *pervasive gaming*: games that are layered into everyday life as opposed to being played on a distinct device at a distinct time (Montola & Stenros 2009).

One challenge in implementing advanced game design patterns in more traditional forms of business is the obvious lack of “gameness” in such services. Complex rules and achievements might be difficult to articulate in marketing communications without an explicit agreement that there is a game in progress. One potential direction for further research could thus be to examine ways in which marketers could build game mechanics into marketing strategies in contexts where there is no explicit agreement that a “game” is being played; in other words, research on “business game design”.

7.3 Patterns of persuasion

Finally, one more possible link for the patterns identified in this study is so-called *captology* or *persuasive technology*: the notion of using technology to persuade people to change their behavior towards some desired goal (Fogg 2003). These patterns can be seen as one branch or subset of persuasive techniques that could be applied in a variety of areas. Applications for persuasive technology are diverse, ranging from promoting environmentally friendly behavior (Nakajima et al. 2008) to motivating exercise (Toscos et al. 2006) or house cleaning (Strengers 2008). Selling products or services could be seen as one application area, linking game design, persuasive technology and marketing.

Malaby (2007) suggests that if we look at games as domains of artificial outcomes, of “contrived contingency”, we find that society is full of games: ones associated with business risk, others associated with political risk, and still others that relate to cool consumption styles, popularity and friends. Increasingly, the distinction between computer games and these other “games” in the society is blurring, with MMOs and SNSs blazing the trail. It should perhaps not be surprising, then, that we can find similarity in the rules and structures of these domains, even if the study of those rules takes different names, such as marketing and game design. A promising direction of research, pioneered in this study, is to take what we have learned in one domain and adapt it to others.

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Defining Gamification - A Service Marketing Perspective

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ABSTRACT

During recent years “gamification” has gained significant attention among practitioners and game scholars. However, the current understanding of gamification has been solely based on the act of adding systemic game elements into services. In this paper, we propose a new definition for gamification, which emphasizes the experiential nature of games and gamification, instead of the systemic understanding. Furthermore, we tie this definition to theory from service marketing because majority of gamification implementations aim towards goals of marketing, which brings to the discussion the notion of how customer / user is always ultimately the creator of value. Since now, the main venue for academic discussion on gamification has mainly been the HCI community. We find it relevant both for industry practitioners as well as for academics to study how gamification can fit in the body of knowledge of existing service literature because the goals and the means of gamification and marketing have a significant overlap.

Categories and Subject Descriptors

H1.m. Information systems - Miscellaneous

General Terms

Theory, design, management

Keywords

Gamification, games, game design, service marketing, service design, persuasive technologies

1. INTRODUCTION

Gamification has raised a lot of interest both in industry [21] and also increasingly in academia [7][22][3] during the past few years. For example, the success of mobile services such as Foursquare and Nike+ are often attributed to gamification [7]. This discussion has remained, however, mainly in the realm of game studies and social sciences. Although an increasing number of games are offered as services to consumers, only very few academic articles that bridge game studies to service or marketing literature have been published (see exceptions e.g. [26][14][15]). Anchoring findings in game studies to the existing service marketing literature could provide a framework on how gameplay can be viewed as a part of the overall service and on how it supports the core service offering. It could also bring proven models from

service marketing to the development of “gamified” services.

In the next section of this paper, we give an overview to the central concepts of gamification in game studies. In section number 3, we introduce service marketing and then in section 4 go on in presenting some of its concepts relevant for our study. In section 5, we situate games to the service marketing literature and then in section 6, we elaborate on the experiential nature of games. In section 7, we present a definition for gamification from the service marketing perspective. In section 8, by referring to our definition we show how it can be used to identify four possible gamification providers. In section 9, we discuss how the new definition relates to game studies. In section 10, we summarize the results and discuss its contribution both to the scientific community as well as to the practitioners. In the final chapter 10, we give some directions for future research.

2. GAMES AND GAMIFICATION FROM THE PERSPECTIVE OF GAME STUDIES

In game studies, games are seen as a collection of multiple necessary conditions. None of these conditions alone is sufficient to constitute a game and it is only in combination of them that a game emerges [19][7]. Juul (2003) assembled seven previous definitions, analyzed them and then presented a new definition. In the definitions assembled, the conditions necessary for games vary from author to author. For example, [2] described game as an “exercise of voluntary control systems in which there is an opposition between forces, confined by a procedure and rules in order to produce a disequilibrium outcome.” A more recent study [24] defines a game in turn in the following way: “A system in which players engage in an artificial conflict, defined by rules, that result in a quantifiable outcome”. Juul (2003) describes a game as “a rule-based formal system with a variable and quantifiable outcome, where different outcomes are assigned different values, the player exerts effort in order to influence the outcome, the player feels attached to the outcome, and the consequences of the activity are optional and negotiable”[19].

Although, the definitions vary in emphasis they all include both a systemic component, defining how the game is constructed and an experiential component describing the human involvement within the game. In the Table 1 below, we have enlisted all these conditions of the definition of games and gamification from past literature.

In addition to the division along systematic/experiential axis, Table 1 arranges the conditions to three separate abstraction levels. The first and the most abstract level is shared by all game definitions. It simply states that games are systems, meaning that games are constituted of several interacting sets of mechanisms and actors (systemic condition) and that games always require the active involvement of at least one player (experiential). The second abstraction level includes conditions that are characteristic

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to games, but are not necessarily present in all games. Under this category fall such systemic conditions as rules, conflicting goals and uncertain outcomes. Deterding et al. (2011) labels these conditions game design elements [7]. Level 2 experiential outcomes are hedonic experiences, suspense (that results from player valuing outcomes but being uncertain of them) and gamefulness. Also mastery and competence stated by [23] could be included in this category. The third abstraction level should include conditions that are unique to games. However, this level remains empty in the light of past literature defining games. There does not seem to be elements that were solely unique to games.

Table 1: Game conditions

Level of abstraction	Systemic conditions	Experiential conditions
1 st level (common to all games)	- Games are system (1, 2, 3, 4, 5, 6, 7, 8, 9)	- Games require voluntary involvement of players/users (1, 2, 3, 4, 5, 6, 7, 8, 9)
2 nd level (characteristic to games, although not necessarily to all games)	- Rules (1, 2, 4, 5, 6, 7, 8, 9) - Conflicting goals (1, 3, 4, 6, 7, 8, 9) - Variable and uncertain outcomes (1, 2, 4, 6, 7, 8)	- Generates hedonic pleasure (2, 4, 5, 6) - Generates suspense (4, 6) - Generates gamefulness (4)
3 rd level (unique to games)	- ?	- ?
Referred articles: 1.[2]; 2. [4]; 3.[5]; 4.[7]; 5. [17]; 6.[19]; 7. [20]; 8. [24]; 9. [27]		

The lack of systemic conditions unique to games is not surprising, as [19] and [7] have stated that a game emerges only as a combination of conditions and that none of the conditions alone is sufficient in constituting a game. However, it is surprising that none of the definitions describe an experiential condition unique to games. If this would be the case, how would anyone recognize a game? Or to put the question in [19]’s and [7]’s words, how would anyone know when a game has emerged from a combination of different necessary conditions if it were not for an experiential condition unique to games? The term ‘gamefulness’ could be used to describe such a unique condition, just like McGonigal [28] has suggested. Yet, [7] make a distinction between games and gamified services and state that both can lead to gameful experiences, thus rendering gamefulness a condition that is not unique to games. However, we think this is up for debate.

The term ‘Gamefication’ was first used in 2008 in a blog post by Brett Terill [29]. He described the term as ‘taking game mechanics and applying them to other web properties to increase engagement.’ To a more widespread industry use the term became during 2010 in its current form ‘gamification’ [7].

In spite of the attention the term received quickly in the industry, the academia has been slow to react. To our knowledge there are only two definitions for gamification: the one given by Deterding et al. [7] and the one presented in the first short version and now a drastically different version of this paper. Deterding et al. [7] describe gamification as *the use of game design elements in non-game contexts*. While [7] discuss the experiential aspects of

games, their definition of gamification adopts only a systemic perspective to games. We argue that this approach has several shortcomings and we will discuss them in section 6. In order to give context to our arguments, let us first turn to service marketing literature: its origins and some of its key concepts.

3. EMERGENCE OF SERVICE MARKETING

In the late 1970’s and early 1980’s, a handful of marketing scholars started forming a new school of thought for marketing concentrating on services because the classical marketing axioms were based on the exchange of physical goods, which could not provide a sufficient understanding on services [13]. This line of research developed quite independently of the mainstream marketing science until the 1990’s [12] when it started to gain popularity also outside the sphere of service marketing scholars. Marketing theory build to fit services started to seem applicable also for goods marketing. In 2004, [31] launched the term service-dominant (S-D) logic for marketing and proclaimed that the service approach should replace the classical marketing theory. Since then, the S-D logic for marketing has gained growing interest both in academia as well as in industry.

Two key concepts of the service approach, customer as co-producer and value-in-use, help to explain the ubiquitous applicability of the service logic and the profound difference between the traditional, goods-dominant logic and the new service-dominant logic.

In traditional marketing theory, the production is considered to be carried out by the company and value is considered to be created during the production process by the company and to be embedded in the resulting product. The product then “carries” the value in it and the value is transferred from company to the customer with the transaction. In service context however, this value-in-exchange approach becomes meaningless, as there is no physical product to which the value could be attached.

Service marketing literature sees the customer always as a co-producer of the service, i.e. participating in the production process as the value is generated only once the customer uses the service or the good. In this value-in-use model company’s role in the value creation is to support the customers’ processes by offering resources into them. Resources can refer e.g. to personnel, machinery, service setting, or to available information sources. Furthermore, the value is considered to be experienced and determined by the beneficiary phenomenologically [32].

4. SERVICE, SERVICE SYSTEM AND SERVICE PACKAGE

For the purpose of defining gamification, three key concepts of service marketing need to be defined: service, service system and service package.

Vargo and Lusch [31] define service as “the application of specialized competences (knowledge and skills), through deeds, processes, and performances for the benefit of another entity or the entity itself”. Thus, any intentional act - no matter how small - that helps an entity can be considered a service.

A systematic bundle of services constitutes a service system that, according to [25], “is an arrangements of resources (including people, technology, information, etc.) connected to other systems by value propositions”. A service system’s aim is to use its resources and the resources of others to improve its circumstance and that of others [33].

The service package model [13] in turn helps firms manage bundled services or service systems. The basic service package consists of the core service, enabling services and enhancing services. Enabling services are required in the offering of the core service, while enhancing services support the offering of the core service and thus increase its value or differentiate it from competitors' services.

5. GAMES AS SERVICE SYSTEMS

As the previous section demonstrates, there are a lot of complementarities between the game literature and service marketing theory. Seen through the service marketing literature, game design elements can be described as services and games as service systems. This is supported by table 1 that shows that games are always regarded as systems that require an active involvement by the player.

Games are thus co-produced by the game developer and the player(s). The game developer's part of the co-production takes place when the game's storyline is created, rules invented, game design patterns chosen and visuals designed etc. The player(s)'s part of the co-production and of the value-creation takes place each time the game is played or otherwise interacted with. The game can also be solely or partly developed by the player, of course. The core service of the game is to provide hedonic, challenging and suspenseful experiences for the player(s) [21] or gameful experiences [22]. The quality of such a "game service" is strongly determined by the functional quality of the service or game experience, which is often referred to as flow [6].

6. SUBJECTIVE NATURE OF THE EXPERIENCED VALUE OF A GAME

It is noteworthy that from the service marketing perspective, it is always only the player's participation in the game, i.e. playing the game, that completes the production of the game service. This notion is consistent with the definitions of games presented in chapter 2 that see player's voluntary commitment and participation as one key building block of a game. However, according to the service marketing theory, the value of a service is determined solely by customer's subjective experience, as service providers can make only value propositions. What follows is that value of a game service, be it 'pleasure', 'suspense', 'mastery' or 'gamefulness', is always determined by the player's individual perception. In other words, it is possible that the use of a game service leads to gameful experiences with one user but does not do so with another user. This difference in outcomes may be due, for example, to differences in skills of the two users/players (see e.g. [30]).

The experience of playing a game as well as determining what *is* a game is deeply individual. Thus, in our view, a game emerges only when the use of the service results in a gameful experience. What follows is that we see gamefulness as a unique experiential condition to games.

This greatly differs from the gamification definition proposed by [7], which highlights that only non-games can be gamified. The obvious question is: How can a service designer possibly identify a non-game context, when the existence of game is dependent on the subjective perception of the player/user. If the sensation of gamefulness is not unique to games this question becomes impossible to answer even for individual consumers. For example, a stock market and dashboard for participating in it can easily be perceived as creating gameful experiences for some users although it is not generally perceived as a game by all users.

Thinking what is a 'full-fledged game' and what is not will only lead the designers astray from what should be their focus: customer/user/player experience.

These incompatibilities led us to seek for an alternative way to define gamification from the perspective of service marketing.

7. A PROPOSED DEFINITION FOR GAMIFICATION

Based on the literature presented above, we define gamification in the following way:

Gamification refers to: *a process of enhancing a service with affordances for gameful experiences in order to support user's overall value creation.*

We would like to emphasize that the definition highlights the *goal* of gamification - the experiences that it attempt to give rise to - rather than the methods. Past definitions rely on the notion that gamification is based on the use of game elements. However, there doesn't seem to exist a clearly defined set of game elements which would be strictly unique to games, neither they automatically create gameful experiences. We can find similar elements from a variety of non-game contexts as well. If we subscribed to the idea that game elements create a game or gamify a system, then we could conclude that also stock exchange dashboard, decision support systems, loyalty programs and other services that have for example levels, points and progression metrics would also be games, regardless of the subjective experiences the users have. Furthermore, gamification is not always carried out through any concrete elements alone. Therefore, we argue that the definition of gamification (nor games) cannot be based on a set of methods or mechanics, but instead it has to be understood more broadly as a process in which the gamifier is attempting to increase the likelihood for the gameful experiences to emerge by imbuing the service with *affordances* for that purpose (be it badges or more implicit cues). The term *affordance* here can refer to any qualities of the service system that contributes [11] to the emergence of gameful experience.

Another aspect we would like to highlight is that the definition does not imply that the process of gamification has to be successful. In the same way as game services or products, gamification can only attempt to support the user in creating gameful experiences.

Currently, it seems that the successfulness of gamification has mostly been measured through sales figures, "clicks" and general retention of users. However, if we accept that gamification aims to create "gameful" experiences, then the successfulness of gamification should also be measured through same measurement instruments as games are.

This notion also leads to another point that gives boundary conditions to gamification. If gamification is designed solely to increase figures related to marketing instead of gameful experiences, the designers are in danger to fall into a trap that leads to a conflicting situation between selling and creating valuable experiences. One of the defining aspects of gameful experience is that it is voluntary and that it is carried out by having intrinsic motivation. If, however, the designer attempts to direct player/customers decision making in a way that it reduces the player/user's free choice, then the design moves further away from what is in the core of a gameful experience. With 'gameful experience' we refer to an experience leading to 'gamefulness' - an experiential condition unique to games. However, defining

exactly what "gamefulness" means is outside the scope of this paper, as defining "gamefulness" would also require us to define games themselves.

The word 'enhancement' in the definition refers to the service package concept of service marketing literature introduced in the section 4. It entails that gamification describes a service system where a core service is enhanced by another one. From marketing perspective it is essential to make this distinction.

According to the definition, Foursquare, for example, is not a gamified service in itself, but it can potentially gamify, that is, enhance other services, such as restaurants or bars, through rules, goal setting, variable outcomes, feedback and rewards. Moreover, the definition remains agnostic to the nature of the core service. This means that the core service can also be a game that can be further gamified, creating so-called meta games. From this perspective, it is not only non-games that can be gamified.

Table 2: Examples of gamification

Core service	Enhancing service	Gamified service
Profile in LinkedIn	Progress bar for measuring progress in filling personal details	The enhancing service increases the perceived value of filling all details by invoking progress-related psychological biases.
Café	Mayorship competition in Foursquare	The enhancing service creates a competition between customers where they have to visit the café frequently enough -> retention
Dry cleaner	Loyalty stamp card. You get 1 stamp for every visit	The enhancing service invokes the psychological biases related to progress and thus increases the perceived value of using the same dry cleaner service.
Gym	Heya Heya	Gym experience that sets goals and helps to monitor the progress of the training.

It is important also to notice that according to this definition not all service systems combining games and other services involve gamification, as it is essential that the enhancing service supports the core service, not the other way around. For example, if a geocaching [10] game brings a customer to a public park, gamification has not occurred, as the core service is the geocaching game. In contrast, gamification occurs if the public park offers a geocaching game to its visitors.

After the fact, it may be difficult to make the distinction between the core service and the enhancing service. Theoretically it is the customer's subjective perception that determines what should be considered as the core service. However before the fact, it is the gamification provider's perception that is decisive as it is the gamification provider who decides which service to gamify. Let us now, look how by referring to our definition of gamification we can identify gamification providers.

8. FOUR POSSIBLE GAMIFICATION PROVIDERS

It is not always the provider of the core service that also provides the gamification process. Based on our definition, we can identify four possible gamification providers, i.e. providers of the enhancing service. These are 1) The core service provider, 2) A

third party service provider 3) The customer him/herself 4) Another customer. The enhanced service is provided either by one of these four parties or by a combination of them. Table 3 presents examples of gamified services with different gamification providers.

Table 3: Examples of gamified services with different gamification providers

Core service	Enhancing service	Gamified service	Gamification provider
Clothing store	Loyalty program offered through Facebook deals [8]	Customers who check in regularly using Facebook Places are offered reductions.	Clothing store (core service provider) and Facebook
Restaurant (e.g. Starbucks)	Local Badges in Foursquare	Customers who check in at least three times a week to a same location using Foursquare get a badge.	Foursquare (a third party)
Sports bar	Drinking game [34]	Deciding to incorporate a drinking game to watching hockey, for example.	Customer himself/herself
Coffee house	Tip offered through Foursquare [9]	Adding a quest-like tip to other customers while they are waiting coffee.	Another customer and Foursquare

9. CONCLUSION AND DISCUSSION

Game study literature and service marketing literature are for large parts complementary. However, the previously proposed definition of gamification by Deterding et al. [7] adopts a systemic approach, which seems incompatible with the understanding of value creation in service literature which, in contrast, emphasizes the experiential nature of services.

In this paper, we have defined gamification from the perspective of service marketing as *'a process of enhancing a service with affordances for gameful experiences in order to support user's overall value creation'*. This anchoring of gamification into an existing body of knowledge of service marketing and its concepts like 'service package', 'value-in-use' and 'service systems' will help subsequent research to examine how gamification can contribute to marketing sciences. It also provides the gamification research with proven theoretical models to build upon. The proposed definition is agnostic regarding the nature of the core service that is being gamified. Thus, it challenges the view that gamification can only happen when game-like elements are used in non-gaming contexts.

Using the proposed definition, we have also identified four possible gamification providers. This will help service providers when designing the gamification of their service.

One interesting line for future research could be the investigation of customer loyalty cards and other widely used marketing techniques as gamified services. Gamification could also be used to expand the servicescape model presented by Bitner in 1992, from physical settings to more abstract constructions, as [1] have suggested. Servicescape gives a framework for the landscape where the service takes place and that is under the control of the

service provider [13]. Servicescape affects customers' behaviour and perceptions. An example of servicescape could be the layout of an IKEA store. The layout design forces the customers on a certain path that present numerous temptations to them. Gamification could be used to enhance the experiential dimensions of servicescape that lead customers to gameful paths through the service process.

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Social Motivations To Use Gamification: An Empirical Study Of Gamifying Exercise

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SOCIAL MOTIVATIONS TO USE GAMIFICATION: AN EMPIRICAL STUDY OF GAMIFYING EXERCISE

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Abstract

This paper investigates how social factors predict attitude towards gamification and intention to continue using gamified services, as well as intention to recommend gamified services to others. The paper employs structural equation modelling for analyses of data (n=107) gathered through a survey that was conducted among users of one of the world's largest gamification applications for physical exercise called Fitocracy. The results indicate that social factors are strong predictors for attitudes and use intentions towards gamified services.

Keywords: Gamification, Persuasive Technology, Social Networking Service, Facebook, Social Influence, Fitocracy, Recognition, Word-of-Mouth, Network Exposure, Reciprocity, Exergames.

1 Introduction

In the last couple of years, *gamification* (Hamari and Lehdonvirta, 2010; Deterding et al. 2011; Huotari and Hamari, 2012) and persuasive technologies (Fogg, 2003; Oinas-Kukkonen and Harjumaa, 2009) have been strongly harnessed for purposes of marketing, attitude change, and motivational pull. Gartner (2011) predicts that by 2015 a full 50% of organisations will have gamified their processes. Especially, *social networking services* (SNSs) and (social) games have been two parallel precursors to gamification. Social networking services such as *Facebook*, Google+, Twitter, and MySpace provide motivational affordances addressing needs for social interaction (Boyd and Ellison, 2007; Ellison et al., 2007). Concurrently, games such as Angry Birds and World of Warcraft have shown how games are powerful providers of persuasive service design (Hamari and Järvinen, 2011) which invoke cognitive intrinsic motivations, such as feelings of mastery.

There are several examples where these developments come together in form of services that are specifically focused on gamifying specific activities, such as listening to music (Last.fm - a gamified music tracking service), watching TV (GetGlue - a gamified television watching service) or exercising (Fitocracy - a gamified exercise tracking service). In essence, these gamification services provide game-like features that enable, for example, goal-setting by providing objectives, rewards, tracking, and monitoring the given activities (Hamari, 2013). Furthermore, essential to typical gamification services are the social aspects: people collect badges, rise in high-score lists and collect points for social reasons, such as receiving recognition.

In this paper, we investigate how these social factors related to *network effects*, *social influence*, *recognition*, and *reciprocal benefits* can predict attitude toward gamification, intentions to continue using it, and intentions to recommend it to others. The data was gathered via an online survey in one of the world's largest exercise-related gamification services called Fitocracy, which features gamified elements such as points, levels, and achievements (see Hamari and Eranti, 2011 on achievements) combined with a community of users who can 'like' and comment the exercise reports and other activities. The aim of the service is to encourage and persuade (Fogg, 2003) toward healthy exercise habits.

2 Gamification, persuasion, and related concepts

Gamification refers to service design aimed at providing game-like experiences to users, commonly with the end-goal of affecting user behaviour (Huotari and Hamari, 2012). Gamification differs from other, parallel developments in a few key ways: 1) Gamification commonly attempts to afford experiences reminiscent of games (e.g. flow, mastery and autonomy), rather than offering direct hedonic experiences by means of e.g. audiovisual content or economic incentives as seen in loyalty marketing (Huotari and Hamari, 2011; Huotari and Hamari, 2012). 2) Gamification attempts to affect motivations rather than attitude and/or behaviour directly, as is the case in persuasive technologies (Fogg, 2003; Oinas-Kukkonen and Harjumaa, 2009; Hamari 2013). 3) Gamification refers to adding 'gamefulness' to existing systems rather than building an entirely new game as is done with 'serious games' (Deterding, 2011; Huotari and Hamari, 2012).

Persuasive technologies, on the other hand, refer to interactive computer systems designed to change the attitude and/or behaviour of the user (Fogg, 2003; Oinas-Kukkonen and Harjumaa, 2009). Clearly there is some overlap between gamification and persuasive technology. For instance, some *persuasion* mechanisms can be regarded as similar to those applied in gamification, such as feedback and rewards (see e.g. Oinas-Kukkonen and Harjumaa, 2008).

Overall, most gamification services, games, social networking services and persuasive systems include affordances for both social as well as gameful interaction. Social and game dimensions could be

considered complementary in persuasive design. Therefore, it is essential to also study the social factors in gamification along with goals and rewards (Hamari, 2013).

Depending on how we conceptualise different approaches in persuasive design, gamification could be seen as an overarching concept in the sense that it can be utilised in several domains or as a particular kind of persuasive design within other approaches (see Table 1, below).

Concept	Definition	Goal
Gamification	'A process of enhancing a service with (motivational) affordances for gameful experiences in order to support the user's overall value creation' — Huotari and Hamari (2012).	to support the user's overall value creation by providing gameful experiences (see goal of games)
Games ¹	Free, no material interest, voluntary, uncertain, governed by rules, interesting choices, mastery, flow — Huizinga (1955), Caillois (1958), Avedon and Sutton-Smith (1971)	to create experiences such as flow, intrinsic motivation, achievement and mastery
Loyalty programme	'Marketing efforts which reward, and therefore, encourage loyal customer behaviour in order to increase the profitability of stable customer relationships' — Sharp and Sharp (1997)	to increase customer loyalty
Persuasive technology	Interactive information technology designed for changing users' attitudes or behaviour — Fogg (2003), Oinas-Kukkonen and Harjumaa (2009)	to change attitudes and behaviours
Choice architecture	'To nudge people towards the right choices [to make their lives better]' — Sunstein and Thaler (2008)	to help people make better decisions
Decision support systems	'A computer based system to aid decision-making [for running organisations more efficiently]' — Sol et al. (1987)	to make decision-making activity more effective

Table 1. Comparison between parallel concepts related to changing attitude and behaviour.

3 Theoretical background

The core of the research model draws from the theory of planned behaviour (TPB) (Ajzen, 1991) and extends the TPB with factors related to network effects (Lin and Bhattacharjee, 2008), recognition (Hernandez et al., 2011; Hsu and Lin, 2008; Lin and Bhattacharjee, 2010; Lin, 2008), and perceived reciprocal benefits (Hsu and Lin, 2008; Lin, 2008), which we hypothesise to be relevant social factors predicting attitudes and use behaviour in a gamification service (Figure 1). The TPB is a model widely applied to explain behavioural intentions by measuring the attitude toward the behaviour and social influence (Ajzen, 1991); therefore, it is highly applicable for measuring attitudes in a persuasive environment, as the goals of persuasion and gamification are in the end related to attitude and behaviour change.

3.1 Social influence

Social influence refers to an individual's perception of how important others regard the target behaviour and whether they expect one to perform that behaviour (Ajzen, 1991; Fishbein and Ajzen, 1975). In the context of this study, the target behaviour is the use of gamification to motivate oneself (to exercise). Social influence is then likely to reflect the user's perceptions of how other users

¹ Games are included in order to show the relationship between games and gamification.

perceive the use of the service. By receiving recognition in the forms of 'likes' and comments, a user receives feedback on how well he or she has conformed to those perceived expectations of other users.

In line with Bock et al. (2005), Lewis et al. (2003), and Venkatesh and Davis (2000), we propose that the social influence, through the identification and internalisation processes relevant for group-formation (Kelman, 1958), affects attitude to using the service. Therefore, we hypothesise that social influence positively affects perceptions of recognition: the more strongly a person believes that others expect and support certain behaviour, the better it feels to conform to those expectations. Furthermore, when the relevant behaviour is supported and socially accepted, such social influence has a positive effect on the attitude toward the service.

H1a: Social influence positively influences the perceived amount of recognition received.

H1b: Social influence positively influences the attitude toward the use of gamification.

3.2 Recognition

Recognition fundamentally describes the social feedback users receive on their behaviours: users interacting with other users (Cheung et al., 2011; Lin, 2008). We propose that receiving recognition creates willingness to recognise others reciprocally within a service, which further promotes social interaction. In this manner, receiving recognition creates reciprocal behaviour (Cialdini et al., 1992; Cialdini and Goldstein, 2004) and increases the perceived benefits received from the use of the service. Furthermore, we hypothesise that the service is conceived more positively (Preece, 2001) when it produces a sense of recognition from others, thus positively affecting the user's attitude to using the service.

H2a: Recognition positively influences perceived reciprocal benefit.

H2b: Recognition positively influences attitude toward the use of gamification.

3.3 Reciprocal benefit

Perceived reciprocal benefit can be viewed as a form of social usefulness of the service – i.e., contributing and, in turn, receiving benefit from the social community (Preece, 2001; Lin, 2008). The *reciprocity*, receiving and contributing in a manner considered beneficial by the community, is likely to be of fundamental importance in encouraging users to carry out activities encouraged by the gamification system. Therefore, we hypothesise that reciprocal benefit positively influences the attitude toward the system's use:

H3: Perceived reciprocal benefit positively influences the attitude toward the use of gamification.

3.4 Network exposure

According to the theory of network externalities, the network effects (i.e., the value from the network) arise when the benefits from using the service depend on the number of other users (Katz and Shapiro, 1985; Lin and Bhattacharjee, 2008). The number of peers has been viewed as essential for SNSs, since they become more attractive to users as the quantity of peers or friends in the system increases (Baker and White, 2010; Sledgianowski and Kulviwat, 2009; Lin and Lu, 2011). Lin and Lu (2011) found the number of peers to be the second most influential factor in continuing use of an SNS.

However, instead of the network exposure affecting attitude directly, we hypothesise that the effect of *network exposure* is mediated by the other social factors. We propose that social influence, recognition, and reciprocal benefit mediate the effects of network exposure on the attitude toward use of the system, as attitude is likely to be dependent on the social input and the activity taking place in the network. Therefore, we hypothesise the following:

H4a: Network exposure positively influences perceived social influence.

H4b: Network exposure positively influences perceived recognition.

H4c: Network exposure positively influences perceived reciprocal benefit.

3.5 Attitude and intentions

In this study, attitude toward system use refers to the overall evaluation of the system’s usage, be it favourable or unfavourable (Fishbein and Ajzen, 1975; Ajzen, 1991). A strong relationship between attitude and use intentions has been shown in several studies (see, for example, Lin and Bhattacharjee, 2010; Bock et al., 2005; and Baker and White, 2010).

Word-of-mouth (WOM) refers to a person’s willingness to recommend a service to others. In the context of continued use intention (Bhattacharjee, 2001), it reflects the user’s satisfaction with the service in question and his or her trust that the service will continue fulfilling his or her expectations (Kim and Son, 2009; Srinivasan et al., 2002). Therefore, we hypothesise the following:

H5: Attitude positively influences continued use intention.

H6: Attitude positively influences intentions to recommend the service (i.e., WOM).

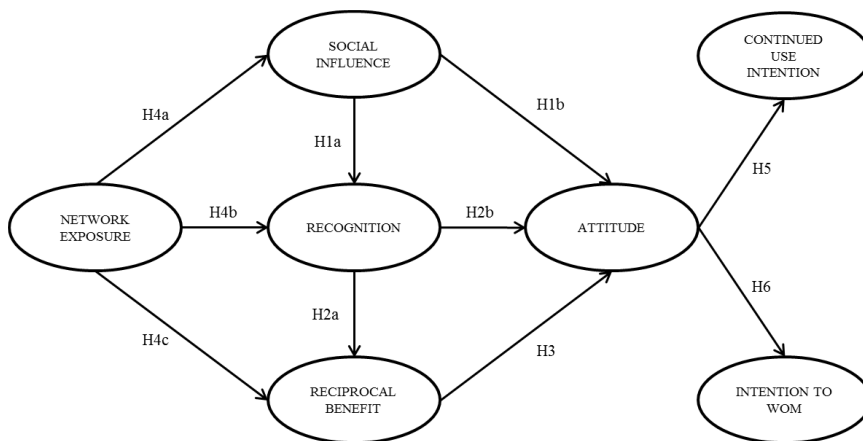


Figure 1. The research model.

4 The empirical study

4.1 Data

The data was gathered via an online questionnaire from the users of a service called Fitocracy that gamifies exercise:

“[Exercise] activities earn you points. Points lead to level ups. Earn badges for significant achievements. The community will reward your hard work with props.” – Fitocracy (2013).

Fitocracy’s persuasive design can be seen to consist mainly of motivational affordances corresponding to achievement and competence as well as social influence and relatedness (see Zhang, 2008 on motivational affordances). The service incorporates gamification in the form of offering an

opportunity to track one’s exercise and, on the basis of a point value allocated to a given exercise, enables gaining points, level-ups, and achievements for one’s actions. Users can also complete quests by performing and tracking an exercise corresponding to a given set of conditions or challenge other users into duels. Furthermore, other users can give feedback on achievements, level-ups and statuses by ‘liking’ or commenting the updates. The service holds similarities with SNSs in that it creates a venue for social activity such as group-forming and communication, incorporates profile-building and the possibility of sharing content (Lin and Lu, 2011; Baker and White, 2010; Boyd and Ellison, 2007; Ellison et al., 2007; Pfeil et al., 2009).

The survey was conducted by posting a description of the study and the survey link to the discussion forum and groups within the service. The survey was accessible only for users of the service. The questionnaire was launched on 17 October, and all 107 responses were gathered within the next three weeks. All respondents were entered in a prize draw for one \$50 Amazon gift certificate.

Time using the service	N	%	Age	N	%	Gender	N	%
Less than 1 month	12	11,2	20 or less	6	5,6	Female	54	50,5
1 - 3 months	20	18,7	21-25	37	34,6	Male	53	49,5
3 - 6 months	18	16,8	26-30	31	29,0			
6 - 9 months	16	15,0	31-35	15	14,0			
9 - 12 months	16	15,0	36-40	14	13,1			
12 - 15 months	23	21,5	41 or more	4	3,7			
More than 15 months	2	1,8						
Total	107	100		107	100		107	100

Table 2. Time using the service, age and gender information of the respondent data.

4.2 Validity and reliability

All of the model-testing was conducted via component-based PLS-SEM in SmartPLS 2.0 M3 (Ringle et al., 2005). The key advantage of the component-based PLS (PLS-SEM) estimation, when compared to co-variance-based structural equation methods (CB-SEM), is that it is non-parametric and therefore makes no restrictive assumptions about the distributions of the data. Secondly, PLS-SEM is considered to be a more suitable method for prediction-oriented studies, while co-variance-based SEM is better suited to testing which models best fit the data (Anderson and Gerbing, 1988; Chin et al., 2003).

Convergent validity (see Table 3) was assessed with three metrics: average variance extracted (AVE), composite reliability (CR), and Cronbach’s alpha (Alpha). All of the convergent validity metrics were clearly greater than the threshold cited in relevant literature (AVE should be greater than 0.5, CR greater than 0.7 (Fornell and Larcker, 1981), and Cronbach’s alpha above 0.8 (Nunnally, 1978)). Only well-established measurement items were used (see Appendix), all with a loading over 0.7. No indicators were omitted. Furthermore, there were no missing data; therefore, no imputation methods were used. We can conclude that the convergent validity and reliability requirements are met.

Discriminant validity was assessed first through comparison of the square root of the AVE of each construct to all of the correlation between it and other constructs (see Fornell and Larcker, 1981), where all of the square root of the AVEs should be greater than any of the correlations between the corresponding construct and another construct (Jöreskog and Sörbom, 1996; Chin, 1998). Secondly, in accordance with the work of Pavlou et al. (2007), we determined that no inter-correlation between constructs was higher than 0.9. Thirdly, we assessed discriminant validity by confirming that all items had the highest loading with its corresponding construct. All three tests indicate that the discriminant validity and reliability are acceptable.

	AVE	CR	Alpha	ATT	CUI	NE	RECIP	RECOG	SOCINF	WOM
ATT	0.773	0.932	0.902	0.879						
CUI	0.738	0.919	0.883	0.671	0.859					
NE	0.867	0.963	0.949	0.394	0.328	0.931				
RECIP	0.710	0.907	0.864	0.645	0.505	0.442	0.843			
RECOG	0.810	0.945	0.922	0.561	0.401	0.517	0.657	0.900		
SOCINF	0.696	0.901	0.854	0.638	0.448	0.367	0.503	0.423	0.834	
WOM	0.721	0.912	0.871	0.773	0.613	0.468	0.660	0.728	0.641	0.849

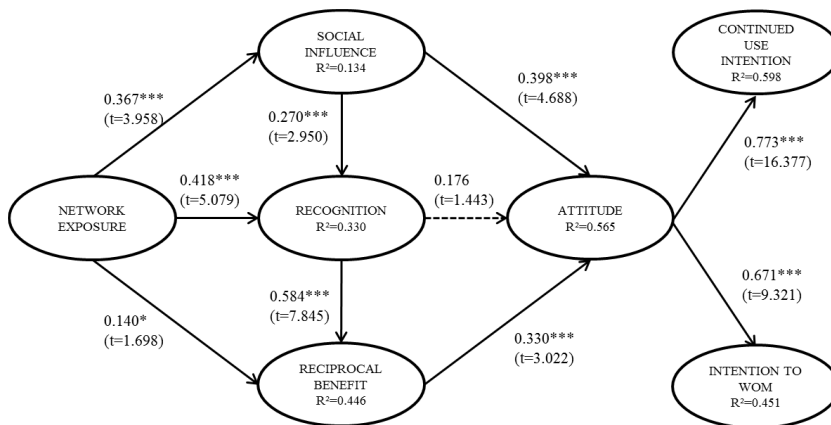
ATT = attitude, CUI = continued use intentions, NE = network exposure, RECIP = reciprocal benefits, RECOG = recognition, SOCINF = social influence, WOM = word-of-mouth intention. The figures on the diagonal correspond to square roots of the average variance extracted for the corresponding construct.

Table 3. Convergent and discriminant validity.

4.3 Results

The research model (Figure 2) could account for 59.8% of the continued use intention for the gamification service as well as 45.1% of intention to recommend the service to other people. Furthermore, the social factors accounted for 56.5% of the variance of attitudes toward the use of a gamified service. In addition, the model also accounted for 13.4% of the variance in social influence, 33% of recognition, and finally 44.6% of the variance of perceived reciprocal benefit.

Overall, the results (Figure 2) support all of the hypotheses except for hypothesis 2b. Network exposure positively influences all three social persuasion-related constructs (H4a–c). In the previous section of the paper we also hypothesised that network exposure would not have a direct effect on attitude but instead it would be mediated by other social factors. Indeed the coefficient between network exposure and attitude was only 0.017 ($p > 0.1$), whereas the total effect via other social factors was 0.394 ($p < 0.01$). Social influence positively influences attitude directly (H1b) and also the perceived degree of recognition users receive (H1a). Our results indicate that recognition does not have a significant direct effect on attitude (H2b); however, it has a positive influence on the perceived reciprocal benefits gained from the use of the service (H2a). Perceived reciprocal benefits were found to be a strong predictor for attitude toward the service (H3). Attitude was found to be a strong predictor of both intentions measured: intent to continue using the service (H5) and intentions to recommend the service to other people (H6).



* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Figure 2. Path model results.

5 Discussion

In this paper, we investigated how social motivations predict attitude towards the use of gamification, and intentions to continue using a gamified service. The results indicate that social factors are strong predictors for how gamification is perceived and whether the user intends to continue using the service and/or recommending it to others. Additionally, these relationships were further positively influenced by the degree to which users are exposed to other users in the service.

The results also indicate that the amount of recognition users receive might not directly affect their attitudes toward gamification to a significant degree. However, recognition did have an indirect effect on attitude, through the concomitant increase in perceived reciprocal benefits. This could be due to that simply receiving recognition – e.g., in the form of ‘likes’ – might not improve how the service is perceived unless, at the same time, the user feels that receiving and giving recognition increased the benefits from using the service. This would further explain the indirect effect on attitude from the perceived reciprocity through beneficial experience created by the service.

Understandably, the larger the network, the more it is possible to receive recognition, get exposed to more social influence, and receive more reciprocal benefits from its use. However, the results show a relatively weak direct relationship between network exposure and reciprocal benefits. This could imply that the size of the network might not have so much intrinsic value with regard to reciprocal benefits directly. Instead, one could posit that the influence stems from the quality of the connection with other people and/or the frequency and nature of the interaction. Further inferences about this relationship, however, are beyond the scope of this study and remain possible avenues for future enquiry.

The results indicate that attitude toward a gamification service is a strong determinant of one’s intentions to continue using the service as well as of intentions to recommend the service to others. Thus the study further confirms the role of attitudes in explaining behavioural intentions (Ajzen, 1991).

5.1 Implications for the design of gamification and persuasive systems

From a design perspective, the findings have several implications. In the context of gamification and persuasive design, it is essential to take into account also the importance of having a community of people who are committed to the same goals. The importance of the network is apparent in creating a service with active and participating usage culture: the social norms and attitudes spread and are supported through the network. The network of other users and followers creates chances for meaningful interaction and further allows reciprocal activity and increases perceived benefits from the service. The findings show that enabling users to get exposed to attitudes of others and also to receive feedback directly from other users can positively influence the attitude towards using a gamification service. Further, social interaction via sharing and being exposed to activities of other users is likely to promote goal commitment towards challenges in the service (Locke and Latham, 1990). Commitment towards goals is likely to be an important antecedent for successful gamification and persuasive design. The social activity of sharing and getting recognized from completing challenges will, firstly, diffuse the norms towards challenges in the community and secondly strengthen commitment towards them. In practice, the findings indicate that gamification should be imbued with mechanisms that afford social interaction in order to enhance social influence and the perception of reciprocal benefits. Thus we propose that similarly to many contemporary games, social elements are essential for creating engaging gamification services.

5.2 Further research directions

The study points to several potential avenues for further research. Firstly, further studies could analyse the moderating effects of demographic variables on the effectiveness of social factors in motivating the use of such services. Secondly, in addition to comparing demographic variables, future work could consider differences related to, for example, how people perceive gamification, by measuring whether different gaming motivations differ with regards to adopting gamified services (Yee, 2007; Tuunanen and Hamari, 2012). Thirdly, this paper has explored only social motivations for using gamification (in the context of exercise); further studies could investigate hedonistic (Hirschman and Holbrook, 1982; van der Heijden, 2004; Webster and Martocchio, 1992) and utilitarian motivations (e.g., Davis, 1989) for gamifying activities. Fourthly, further studies could also measure the attitudes toward the gamified activities as well as intentions to partake in those activities.

Acknowledgements

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Appendix

Indicator	Survey item	Loading	Construct source
ATT1	All things considered, I find using Fitocracy to be a wise thing to do.	0.816	Ajzen (1991)
ATT2	All things considered, I find using Fitocracy to be a good idea.	0.925	
ATT3	All things considered, I find using Fitocracy to be a positive thing.	0.888	
ATT4	All things considered, I find using Fitocracy to be favorable.	0.884	
CUI1	I predict that I will keep using Fitocracy in the future at least as much as I have used it lately.	0.869	Venkatesh and Davis (2000)
CUI2	I intend to use Fitocracy at least as often within the next three months as I have previously used.	0.877	
CUI3	I predict that I will use Fitocracy more frequently rather than less frequently	0.843	
CUI4	It is likely that I will use Fitocracy more often rather than less often during the next couple months.	0.848	
NE1	I have a lot of friends on Fitocracy who follow my activities.	0.915	Lin and Bhattacharjee (2008)
NE2	Many people follow my activities on Fitocracy.	0.956	
NE3	I follow many people on Fitocracy.	0.919	
NE4	I have many friends in Fitocracy.	0.935	
RECI1	I find that participating in the Fitocracy community can be mutually helpful.	0.849	Hsu and Lin (2008), Lin (2008)
RECI2	I find my participation in the Fitocracy community can be advantageous to me and other people.	0.882	
RECI3	I think that participating in the Fitocracy community improves my motivation to exercise.	0.773	
RECI4	The Fitocracy community encourages me to exercise.	0.864	
RECO1	I feel good when my achievements in Fitocracy are noticed.	0.890	Hernandez et al. (2011), Hsu and Lin (2008), Lin and Bhattacharjee (2010), Lin (2008)
RECO2	I like it when other Fitocracy users comment and like my exercise.	0.894	
RECO3	I like it when my Fitocracy peers notice my exercise reports.	0.940	
RECO4	It feels good to notice that other user has browsed my Fitocracy feed.	0.875	
SOCINF1	People who influence my attitudes would recommend Fitocracy.	0.773	Ajzen (1991)
SOCINF2	People who are important to me would think positively of me using Fitocracy.	0.877	
SOCINF3	People who I appreciate would encourage me to use Fitocracy.	0.874	
SOCINF4	My friends would think using Fitocracy is a good idea.	0.808	
WOM1	I would recommend Fitocracy to my friends.	0.773	Kim and Son (2009)
WOM2	I will recommend Fitocracy to anyone who seeks my advice.	0.908	
WOM3	I will refer my acquaintances to Fitocracy.	0.780	
WOM4	I will say positive things about Fitocracy to other people.	0.877	

Appendix A. Survey items.

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Transforming homo economicus into homo ludens: A field experiment on gamification in a utilitarian peer-to-peer trading service



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ABSTRACT

During recent years, the addition of game mechanisms to non-game services has gained a relatively large amount of attention. Popular discussion connects *gamification* to successful marketing and increased profitability through higher customer engagement, however, there is a dearth of empirical studies that confirm such expectations. This paper reports the results of a field experiment, which gamifies a utilitarian peer-to-peer trading service by implementing the game mechanism of *badges* that users can earn from a variety of tasks. There were 3234 users who were randomly assigned to treatment groups and subjected to different versions of the badge system in a 2 × 2 design. The results show that the mere implementation of gamification mechanisms does not automatically lead to significant increases in use activity in the studied utilitarian service, however, those users who actively monitored their own badges and those of others in the study showed increased user activity.

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1. Introduction

During recent years, the use of game design elements for marketing purposes has rapidly gained a substantial amount of traction among service marketing practitioners, both in games (Hamari and Lehdonvirta 2010, Hamari and Järvinen 2011), as well as in non-game contexts (Deterring et al. 2011, McGonigal 2011, Zichermann and Cunningham 2011, Huotari and Hamari 2012). This development of enhancing services with game elements has been dubbed as *gamification*. Following the successes of social networking services (Facebook), games (Angry Birds) and location-based services (Foursquare), marketers have started to apply these innovations in non-game contexts. Gamification has already been applied in several areas, including the promotion of greener energy consumption (Ecolisland), building loyalty towards TV channels (GetGlue), taking care of one's health (Fitocracy) and even for gamifying the tracking of one's aspirations in life (Mindbloom). Gartner (2011) predicts that more than 50% of organisations will gamify innovation processes by 2015, as gamification provides accelerated feedback, clear goals and challenging tasks. Clearly, much has been invested in the idea of gamification and its primary *mechanism* (also called *mechanics* in the literature) has involved the use of *badges*, which are used to reward users for favorable pre-defined behaviors in a service. The strong belief in the effectiveness of gamification has mainly been

based on the conception that because games are fun, any service that uses the same mechanism should also prove to be more valuable and engaging. However, there is a dearth of empirical studies investigating the effects that result from gamifying services, in regard to customer and user behavior.

This research studies the effects of gamification on user retention, namely those of usage activity and quality, as well as social interaction within a service. The research problem was approached through a field experiment where a utilitarian peer-to-peer trading service was gamified by a process of implementing badges (Hamari and Eranti 2011). Badges have been regarded as the blueprint of gamification to such a degree, that gamification has been even referred to as *badgification*. In the experiment, people could unlock badges by completing common actions and tasks within the service. The experiment focused on investigating whether: (1) the mere implementation of the goal-oriented features and the social features of badges and (2) whether the active pursuit of badges were positively associated with increased service usage, quality, as well as social interaction within the case service.

This article proceeds as follows. In Section 2, we discuss gamification and badges. Section 3 outline possible theoretical foundations that may explain the effects of badges and gamification, and proposes hypotheses for study. In Section 4, describes the research process, data collection, and the service in which the experiment was conducted. Section 5 outlines the results and Section 6 elaborates on these results, limitations and discusses possible reasons for the supported and unsupported hypotheses. Section 7 concludes the article by suggesting further research directions for studying gamification.

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2. Background

2.1. Gamification

The concept of gamification has strongly divided opinions. Whilst some deem it as a new name for old marketing tools or as a new way of exploiting customers, some regard it as a genuine way of enhancing the value of service. Nevertheless, gamification has quickly become a trend in service marketing. Gamification can be situated in a previously unoccupied space of marketing thinking. For example, previously, *full games* have been used as a value-added service on product webpages and *serious games* have been used in educating consumers. Additionally, loyalty programs can resemble game mechanisms, which have been used to offer economic benefits to customers who in exchange demonstrate customer loyalty. However, the previous ways in which games and consumer behavior have come together in marketing are not exactly the same as in gamification's popular conception.

Gamification can be defined in two ways: (1) the use of game elements in non-game contexts (Deterding et al. 2011) or as (2) a process of providing affordances for gameful experiences which support the customers' overall value creation (Huotari and Hamari 2012). The latter conceptualization is rooted in *service dominant logic* (Vargo and Lusch 2004), which suggests that customers are the creators of value and the company can merely provide affordances for the customer to experience *gamefulness*. This conceptualization of gamification implicitly states that the customer in the end determines whether they are engaged in gameful experiences and whether consequently the perceived value of the service is increased. The other difference between the definitions is that Huotari and Hamari (2012) emphasize that, for gamification to have an effect on retention and customer loyalty, the customers should first be engaged in gameful experiences. The mere addition of game elements does not necessarily guarantee successful gamification. However, in popular discussion the idea prevails that gamification simply refers to adding game mechanisms into a service, which in turn automatically becomes more engaging and attains a better retention of customers.

In addition to linking gamification with service dominant logic, the *gameful experience* could be linked with hedonic usage patterns and consumption (Hirschman and Holbrook 1982), as well as intrinsic (as opposed to extrinsic) motivations (Deci and Ryan 1985) toward the use of information systems and services. Therefore, gamification can be viewed as an attempt to convert utilitarian services into more hedonically oriented. (See, for example, van der Heijden (2004) on hedonic IS.) In terms of IS theory, this sits well within the long-run context of studying technology acceptance (Davis 1989, Venkatesh 1999), continuous usage intentions (Bhattacharjee 2011, Hsieh et al. 2008), and especially with the more recent understanding of the hedonic nature of novel services which has called for the measurement of more hedonic constructs, such as *perceived enjoyment*, *flow*, *immediate feedback*, *clear goals* (Csíkszentmihályi 1990) and *social comparison* (Festinger 1954). As such, gamification might offer an interesting vein for this continuum of research.

In principle, this is also how gamification differs from loyalty programs, although it is often used for pursuing similar goals. Most loyalty programs aim to offer economic benefits (redeemable by points) from the continuous use of services that most likely invokes extrinsic motivations. These, in turn, have been demonstrated to be detrimental to intrinsic motivations, autonomy and creativity (Deci et al. 1999). Game mechanisms in themselves, however, do not provide economic benefits for the users, but are believed to add value to the service via transformation of the usage motivations and intentions (Huotari and Hamari 2012).

2.2. Badges: The blueprint of gamification

Badges have been considered as the *blueprint of gamification* and have been the primary game mechanism in popular gamified applications such as Foursquare. Game industry studies have found that the addition of badges to games has led to better critical reception and increased revenue (Electronic Entertainment Design and Research 2007). In fact, large game console publishers such as Microsoft, demand that game developers include badges in the games that are published for Xbox consoles. However, there is a dearth of literature as to how badges affect user behavior in a gamification setting where users are not predisposed to gaming.

Badges consist of optional rewards and goals whose fulfillment is stored outside the scope of the core activities of a service (Montola et al. 2009, Hamari and Eranti 2011, Jakobsson 2011). On a systemic level, a badge consists of a signifying element (the visual and textual cues of the badge), rewards (the earned badge), and the fulfillment conditions that determine how the badge can be earned (Hamari and Eranti 2011). Furthermore, because of their visual element – especially the badge itself – and the included descriptions regarding the goal and how to unlock a badge, they may also be accompanied by narrative elements and challenges that have been found to give rise to intrinsic motivation (Malone 1981). Previous works hypothesize that badges can provide clear goals, and signal reputation and status, as well as affirm it (Hamari and Eranti 2011). This article reports results of a field experiment which studies the effects of gamification that aims to provide features for *clear goals* and a *social comparison* on usage activity.

3. Hypotheses

We propose two sets of hypotheses divided between *social comparison* (Hypotheses 1–4) and *clear goals* (Hypotheses 5–8), as well as two sets of hypotheses between investigating whether the mere addition of game mechanisms (marked with “a”) and active exposure (marked with “b”) are positively associated with increased usage behavior. The latter sets of hypotheses are related to internal validity; whether the impact from being actually exposed to the gamified features is associated with usage activity. The hypotheses were divided in this manner because it was thought it may have been possible that those users who have been clearly exposed to gamification might show a greater level of activity, or that it might not be possible to determine any significant association between gamifying a service and increased usage activity. The dependent variables are the number of trade proposals a user has posted, the number of transactions a user has completed, the number of comments a user has posted, and the number of page views a user has generated.

3.1. Hypotheses 1–4: Social comparison increases usage activity

One of the rationales behind gamification has been to harness the persuasive power that emerges when people compare their points and badges amongst each other, and so benchmark themselves. In general, this phenomenon is called *social comparison* (Festinger 1954), and forms an over-arching concept for other, more specific theories related to the effects which result from comparisons between individuals such as *social influence* and the theory of planned behavior (Ajzen 1991). The social influence and recognition that users receive through gamification have also been found to be strong predictors for the adoption and use of gamification applications (Hamari and Koivisto forthcoming).

Social proof theory (Cialdini 2001a, 2001b; Goldstein et al. 2008) predicts that individuals are more likely to engage in behaviors that they perceive others are also engaged in Cialdini (2001b).

Gamification via badges facilitates social proof by providing a means for users to observe the activities of others and which behaviors they have been rewarded for. “We view a behavior as correct in a given situation to the degree that we see others performing it” (Cialdini 2001b). The other side of this phenomenon is *social validation*, by which people signal their conformity, in that they have also engaged in the same behaviors. Van de Ven et al. (2011) found that people were willing to pay up to 64% more for a product that their peers had already acquired. Badges facilitate social validation by providing a means for users to display their conformity to the behavior and expectations of others. If these phenomena are present to a significant degree, then an increase in use activity for those users who were enabled to compare badges as well as for those users who have actively viewed the badges of other users would be anticipated. We propose the following hypotheses related to social comparison in a gamified setting:

Hypothesis 1a (*Social comparison: productive actions*). Users who are enabled to compare their badges with the badges of other users create more trade proposals.

Hypothesis 1b (*Social comparison: productive actions*). The number of times a user views the badges of other users has a positive effect on the number of trade proposal the user makes.

Hypothesis 2a (*Social comparison: quality of action*). Users who are enabled to compare their badges with the badges of other users complete more transactions.

Hypothesis 2b (*Social comparison: quality of action*). The number of times a user views the badges of other users has a positive effect on the number of transactions the user completes.

Hypothesis 3a (*Social comparison: social interaction*). Users who are enabled to compare their badges with the badges of other users post more comments.

Hypothesis 3b (*Social comparison: social interaction*). The number of times a user views the badges of other users has a positive effect on the number of comments the user posts

Hypothesis 4a (*Social comparison: usage activity*). Users who are enabled to compare their badges with the badges of other users generate more page views

Hypothesis 4b (*Social comparison: usage activity*). The number of times a user views the badges of other users has a positive effect on the number of page views the user generates

3.2. Hypotheses 5–8: Goal setting: Clear goals increase usage activity

According to Bandura (1993), setting goals such as those in badges increases performance in three ways: (1) people anchor their expectations higher, which in turn increases their performance; (2) assigned goals enhance self-efficacy; and (3) the completion of goals leads to increased satisfaction which, in turn, leads to increased future performance with the same activities. These effects are further strengthened if the goals are context-related, immediate, and the users are provided with (immediate) feedback. It has also been found that when the goals are clearly specified in terms of how many times they have to be completed, the rate of completion

of the tasks increases when compared to a condition where the number of times the task has to be completed is not specified (Ling et al. 2005).

Another effect noted from using badges has been connected to their ability to guide user behavior because they set *clear goals*. It has been argued that badges function as a *guidance mechanism* (Montola et al. 2009, Jakobsson 2011, Hamari and Eranti 2011) in a service, providing the user with an idea of how the service is meant to be used and what is expected of the user, thus increasing the *amount* and *quality* of those actions within the service. In a larger context, goals are regarded as a central game mechanism (Salen and Zimmermann, Salen and Zimmerman 2004) and have been demonstrated to exert persuasive power even when the progression towards them was illusory (Kivetz et al. 2006, Nunes and Drèze 2006). Clear goals are also one of the main dimensions of the flow theory (Csikszentmihályi 1990), which predicts that having clear goals and immediate feedback supports the emergence of the *flow state* – where the user’s skills and the challenge of the task are optimally balanced.

Even though users may be offered clear goals as described above, they need to be committed to the goals in order for the hypothesized effects of increased motivation, engagement and performance to arise (Klein et al. 1999). According to Locke and Latham (1990), *goal commitment* can be defined as one’s determination to reach a goal, implying that users are more likely to persist in pursuing the goals and be less likely to neglect them.

The badges in the experiment were designed with the above goal-setting related theories in mind. They provided *clear goals* (including the *specified numeration of goals*) and *immediate feedback*; however their effect on *performance* (the dependent variables) may well be dependent on *goal commitment*. We propose the following hypotheses related to goal setting:

Hypothesis 5a (*Goal setting: productive actions*). Users who are enabled to have clear goals through badges create more trade proposals.

Hypothesis 5b (*Goal setting: productive actions*). The number of times a user views their own badges has a positive effect on the number of trade proposals the user makes

Hypothesis 6a (*Goal setting: Quality of actions*). Users who are enabled to have clear goals through badges complete more transactions.

Hypothesis 6b (*Goal setting: Quality of actions*). The number of times a user views their own badges has a positive effect on the number of transactions the user completes.

Hypothesis 7a (*Goal setting: Social interaction*). Users who are enabled to have clear goals through badges post more comments.

Hypothesis 7b (*Goal setting: Social interaction*). The number of times a user views their own badges has a positive effect on the number of comments the user posts.

Hypothesis 8a (*Goal setting: Usage activity*). Users who are enabled to have clear goals through badges generate more page views.

Hypothesis 8b (*Goal setting: Usage activity*). The number of times a user views their own badges has a positive effect on the number of page views the user generates.

Sharetribe (formerly known as Kassi)

Search Sharetribe

Log in Create account

English Home Requests Offers About

Lend, help, share

Sharetribe is a place where the members of our community can share goods, services, rides, and spaces. You can let others know what you could offer to them and get help when needed.

Share with others! List things and deeds you can offer to others

Tell what you need! Tell others when you need help, an item or a ride

...or see what the others offer and need

What others need

- Renting: A room/studio apartment for girl**
Hello y'all, I want to rent a room or a studio apartme... -- *yaya* 10 hours ago
Contact | Comment
- Buying: Buying/ Taking Earphones or Headphones**
Wish to buy/take high quality headphones/earphones for la... -- *Pratik* 1 day ago
Contact | Comment
- Temporary accommodation: Asunto konservointiharjoittelijalle elo- syyskuuksi 2012**
Ranskalainen konservointiharjoittelija Fleur Foucher etsii... -- *Annu* 1 day ago

What others can offer

- Renting out: Room in Otaniemi JMT 1 (07.08 - 28.08)**
I am offering my room in Järmeräntalval 1 for sub-leasing... -- *Armed* 6 minutes ago
Contact | Comment
- Selling: 3x1GB DDR3 memory modules**
Used Corsair memory kit 3x1GB to be sold. 9-9-9-24 13... -- *Eetu* 9 hours ago
Contact | Comment
- Selling: ASKO SOFIE-sohvasänky / Single/double metal sofa bed**
Metal frame, black in colour. Bought it a couple years... -- *Niber* 10 hours ago
Contact | Comment

What's going on

- Vilhelmina* commented offer **Book shelkirajahityä** 33 minutes ago
- turgay* logged in to Sharetribe 2 hours ago
- Petri* logged in to Sharetribe 4 hours ago
- Bruno* logged in to Sharetribe 8 hours ago
- Andre* agreed to rent **Subrented room in Otaniemi for August to Alexey** 9 hours ago

Fig. 1. Sharetribe homepage “Sharetribe is a network of “tribes”, online communities where you can share goods, services, rides and spaces in a local, trusted environment. You can create a tribe for your university campus, your company, your neighborhood, your association, your sports club, your congregation, you name it!” – Sharetribe FAQ (2013).

4. Methods and data

4.1. Data collection and the case service

Sharetribe (www.sharetribe.com) is an international peer-to-peer trading service that offers its service package to a variety of organizations. See Figs. 1 and 2.

The available localizations as of early 2013 were English, Spanish, Finnish, Greek, French, Russian and Catalan. Sharetribe is used in communities all over the world, and there were 479 local Sharetribes worldwide. The company, Sharetribe Ltd., is a social for-profit enterprise registered in Finland. Its mission is to help people connect with their community and to help eliminate excess waste by making it easier for everyone to use assets more effectively by sharing them.

Sharetribe's marketing strategy focuses on differentiating itself from other trading services such as eBay or Craigslist, by being targeted to narrow local communities such as an organization or town districts and by also offering tools for non-monetary transactions, including borrowing and carpooling. Users can buy and sell goods and services though. Sharetribe uses open source principles in the design of their service and the entire code is offered for anyone to download. The reason for having many *tribes* is to emphasize local communities, trust and information access, and also to diminish transaction costs and costs related to shipping.

4.2. Field experiment

The field experiment was set up in the Sharetribe¹ service and data were gathered from the implementation of badges at the beginning of December 2010 until the end of July 2012. During this time

¹ The previous name of Sharetribe was Kassi. Sharetribe was given its current name in May 2012. We use the current name in the paper to make it easier for readers to find the service.

the service remained the same without any major upgrades.

The existing users were evenly and randomly assigned to four test groups. See Tables 1 and 2. Users who registered after the implementation were further randomly assigned to one of the groups.

The data consists of a database of 3234 users of the Sharetribe Aalto University site, who registered during the experiment timeframe. They include the number of trade proposals, accepted transactions, comments posted and how many individual page views a user undertook. Only users who had registered during the experiment timeframe were selected because older users had existing trade proposals in the service and would therefore have had accumulated actions during the experiment timeframe that would not have been affected by the experiment. Aalto University Sharetribe site was selected for the experiment because it is the largest implementation of Sharetribe of the several hundred installations worldwide.

The experiment was purposefully conducted as a field experiment in a real existing service, rather than in a laboratory setting in which respondents would have been asked to assume a hypothetical scenario of a badge system. In this way, using self-reported data could be avoided that might have potentially reflected novel and glorified attitudes toward the idea of using game mechanisms. With this approach, it is expected to achieve a higher level of validity. The generalizability of the findings is explored later in this article.

For the experiment, the badges were designed in adherence to previous work on conceptualizing the badge game design pattern (Hamari and Eranti 2011), as well as to resemble popular implementation approaches such as those found in Foursquare, the Steam gaming platform and Xbox Live. Table 3 describes the elements of the badges. According to previous works, a badge consists of three main elements: (1) signifier, (2) completion logic and (3) rewards (Hamari and Eranti 2011).

The users were able to unlock badges for typical actions within the service, such as commenting on other peoples' trade proposals, submitting proposals of their own, completing trades – and even

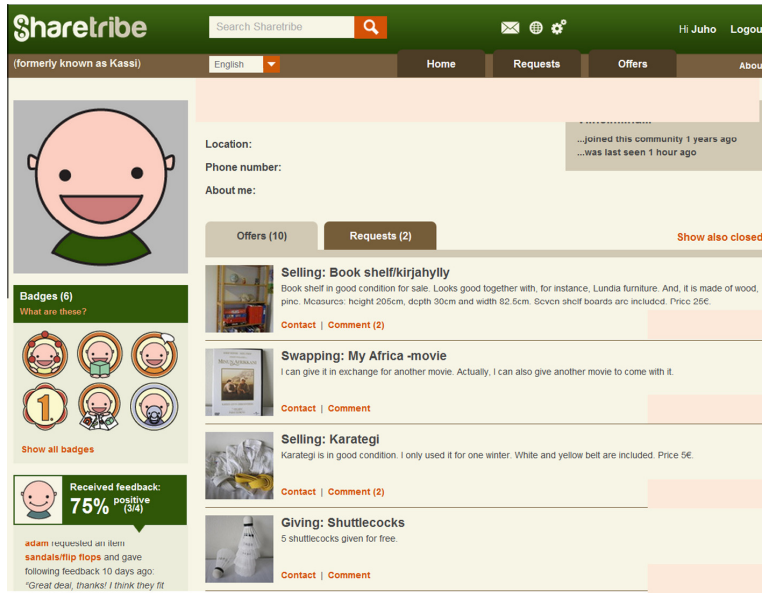


Fig. 2. User profile in Sharetribe.

Table 1
Experimental groups – independent variables.

Ability to view other users' badges (social comparison)	Ability to see from which actions one can unlock badges (clear goals)	
	No	Yes
No	Group 1	Group 3
Yes	Group 2	Group 4

Table 2
Users in treatment groups.

	Count	%
Group 1: Both features disabled (control)	805	24.9
Group 2: Social comparison condition	802	24.8
Group 3: Clear goals condition	790	24.4
Group 4: Both conditions enabled	837	25.9
Total	3234	100/100

Table 3
The badge design.

Element/component	Implemented in Sharetribe
Signifier (name, visual, description)	The badges have a humorous name and a badge itself represents the type of activity that was carried out in order to unlock the badge. Both are also associated with the level of that badge with color coding and text (bronze/silver/gold). The description describes what the user has to do/has done in order to unlock the badge. For example: "You've been in Sharetribe on five different days. It seems you are on your way to become a regular." (Regular badge). This text is only visible for people in the experimental conditions related to <i>clear goals</i>
Completion logic (trigger, pre-requirement, condition, multiplier)	The completion logic does not include any hidden rules. All that has to be done in order to unlock a badge is mentioned in the description component, unless the person is in one of the experiment conditions in which she is not able to see <i>clear goals</i> . The badges have no pre-requirements for unlocking them
Reward	As in other popular services, the only reward from unlocking the badge is that it will be unlocked in the user's profile.



for using the service for a prescribed number of consecutive days. The unlocked badges were displayed on the users' individual profiles, and viewable both by the owner of the badges and other users in the respective treatment groups. Users were notified via email for every badge they unlocked.

Users also were able to view badges on a separate page linked to every users' profile. See Fig. 3. This enabled them to see which badges they had unlocked (colored) and which badges they were yet to unlock (grey). Furthermore, users in the respective treatment groups could also see which activities were unlocked or could unlock the badges.

5. Results

A simple *t*-test on the dependent variables did not show any significant differences between the experiment conditions. See Table 4.

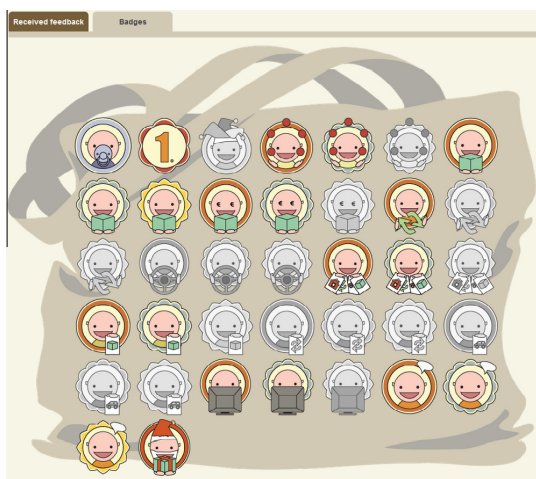


Fig. 3. View of the user's badges in Sharetribe.

A multivariate test (MANOVA) was performed on the effects of the possibilities to compare badges with other users, $F(4, 3227) = 1.679, p = 0.152, \text{Wilk's} = 0.998, \eta^2 = 0.002$; the ability to see from what actions one can unlock badges, $F(4, 3227) = 0.709, p = 0.568, \text{Wilk's} = 0.999, \eta^2 = .001$; and the interaction of the features, $F(4, 3227) = 0.716, p = 0.581, \text{Wilk's} = 0.999, \eta^2 = .001$, on the dependent variables: the amount of trade proposals, accepted transactions, comments posted or page views. These tests did not yield any significant results.

However, this sample included all the users in the data who had registered into the service during the experiment timeframe. Therefore, we moved to a more confined sample population in order to increase the level of internal validity. From the data, only users who had actively used the service after the implementation of badges were selected by selecting only those users who had at least 100 page views. This way, it could be ensured that all the users in the sample had had the possibility of being exposed to the experimental conditions. Even with this sub-sample however, the results did not change remarkably: *social comparison* feature: $F(4, 716) = 1.549, p = 0.186, \text{Wilk's} = 0.991, \eta^2 = 0.009$, or the *clear goals* feature, $F(4, 716) = 0.320, p = 0.865, \text{Wilk's} = 0.998, \eta^2 = 0.002$, or their interaction, $F(4, 716) = 0.507, p = 0.731, \text{Wilk's} = .997, \eta^2 = 0.003$.

We then tested the individual hypotheses by exploring the effects on individual dependent variables using separate ANOVA analyses. However, even here, we were unable to determine any significant effects from the two features on any of the dependent variables, and therefore, unable to find evidence to support Hypotheses 1–8a. See Table 5.

We then tested whether support for Hypotheses 1–8b could be found pertaining to whether the active exposure to gamified elements has a positive effect on the dependent variables. The exposure was measured via the number of views of the badge pages

Table 4
t-tests on dependent variables between the experimental groups.

Test group ID	Social comparison/clear goals	Trade proposals		Accepted transactions		Comments		Page views	
		Mean	SD	Mean	SD	Mean	SD	Mean	SD
1	No/No	1.00	3.08	0.52	1.61	0.62	2.20	115.18	263.77
2	Yes/No	1.15	3.55	0.49	1.64	0.70	2.61	106.47	281.01
3	No/Yes	0.92	3.25	0.48	1.48	0.63	2.14	97.32	243.55
4	Yes/Yes	1.04	3.13	0.40	1.35	0.63	2.72	97.84	252.58

of other users (*social comparison* condition – H1–H4b) and the number views of the users own badge page (*clear goals* condition – H5–H8b). Multivariate testing (MANCOVA) on the effects derived from viewing other users' badges ($F(4, 3228) = 5.814, p = 0.000^{***}, \text{Wilk's} = 0.993, \eta^2 = 0.007$), viewing the users own badges ($F(4, 3228) = 565.361, p = 0.000^{***}, \text{Wilk's} = 0.588, \eta^2 = 0.412$) and their interaction ($F(4, 3228) = 58.324, p = 0.000^{***}, \text{Wilk's} = 0.933, \eta^2 = 0.067$) all showed significant results. However, the effect of viewing other users' badges was relatively small.

We then moved onto testing hypotheses individually by using ANCOVA tests. The results showed that the amount of views of the users own badges was positively associated with all the dependent variables, whereas the amount of views of other people's badge pages was only positively associated with the number of submitted trade proposals. See Table 6.

Based on these tests, it can be concluded that comparing badges does seem to have a positive effect on use, however, it is so small that the effects were difficult to establish for the different dependent variables independently and the only significant effect from comparison could be established in the amount of trade proposals a user makes.

Additionally, it was found that only 38 users had visited other users' badge pages, whereas 664 users had visited their own badge page. Thus, it might not be surprising that any strong effects derived from comparing badges with other users could not be established. Instead, the fact that so few users had demonstrated any interest in the badges of other users implies even more essential challenges to gamification. This result implies that gamification clearly does not seem to be effective in all contexts, not necessarily because it would fail to arouse the anticipated psychological effects previously proposed, but instead because it can fail with regards to users becoming interested in the gamified features of the service in the first place. If we consider hedonic services such as games, where people by default are oriented towards gameful interaction, then the situation can be dramatically different.

It is commonplace to use ANOVA or similar types of analysis even though the data was non-normal. Also in this study, the dependent variables are not normally distributed, as there were more users with zero actions than users with one action, more users with one action than two actions and so forth. Therefore, the test were ran again using the Mann–Whitney *U* test, which is nonparametric and especially suitable for handling non-normal data. Even here, however, the results remained insignificant, with the following *p*-values – H1a: 0.972; H2a: 0.256; H3a: 0.795; H4a: 0.193; H5a: 0.965; H6a: 0.745; H7a: 0.430; and H8a: 0.169. The same was also the case with the sub-sample consisting only of active users (≥ 100 page views). The *p*-values are – H1a: 0.084; H2a: 0.136; H3a: 0.568; H4a: 0.509; H5a 5a: 0.916; H6a 6a: 0.934; H7a: 0.882; and H8a 8a: 0.399.

Table 7 presents an overview of the results.

6. Limitations and discussion on unsupported hypotheses

Given that the phenomenon under examination is relatively novel, it is still difficult to say which exact psychological theories can explain the effects stemming from badges or other game mecha-

Table 5
Test of Hypotheses 1–8a.

H#	Independent variable	Dependent variable	Result (3234 users registered during the experiment)			Results (723 active users with at least 100 page views)		
			F	p	η^2	F	p	η^2
1a	Comparison	Number of trade proposals	1.265	0.261	0.000	2.186	0.140	0.003
5a	Goal		0.695	0.405	0.000	0.166	0.683	0.000
	Comparison × Goal		0.022	0.882	0.000	0.333	0.564	0.000
2a	Comparison	Number of accepted transactions	1.131	0.288	0.000	0.790	0.374	0.001
6a	Goal		1.405	0.236	0.000	0.715	0.398	0.001
	Comparison × Goal		0.143	0.705	0.000	0.716	0.398	0.001
3a	Comparison	Number of comments	0.174	0.677	0.000	0.244	0.621	0.000
7a	Goal		0.110	0.741	0.000	0.015	0.901	0.000
	Comparison × Goal		0.248	0.619	0.000	0.769	0.381	0.001
4a	Comparison	Number of page views	0.200	0.655	0.000	0.052	0.820	0.000
8a	Goals		2.087	0.149	0.001	0.598	0.440	0.001
	Comparison × Goal		0.254	0.614	0.000	0.017	0.897	0.000

Table 6
Test of Hypotheses 1–8b.

H#	Independent variable - Views to	Dependent variable	Results		
			F	p	η^2
1b	Badge pages of others	Number of trade proposals	5.450	0.020**	0.002
5b	Own badge page		810.885	0.000***	0.201
2b	Badge pages of others		2.247	0.134	0.001
6b	Own badge page	Number of accepted transactions	1034.045	0.000***	0.242
3b	Badge pages of others		1.957	0.162	0.001
7b	Own badge page		720.280	0.000***	0.182
4b	Badge pages of others	Number of page views	1.398	0.239	0.000
8b	Own badge page		2253.084	0.000***	0.411

Table 7
Confirmation of hypotheses.

H#	Hypothesis	Supported
1a	<i>Social comparison: productive actions</i> Users who are enabled to compare their badges with the badges of other users create more trade proposals.	No
1b	<i>Social comparison: productive actions</i> The number of times a user views the badges of other users has a positive effect on the number of trade proposals the user makes.	Yes
2a	<i>Social comparison: quality of actions</i> Users who are enabled to compare their badges with the badges of other users complete more transactions.	No
2b	<i>Social comparison: quality of actions</i> The number of times a user views the badges of other users has a positive effect on the number of transactions the user completes.	No
3a	<i>Social comparison: social interaction</i> Users who are enabled to compare their badges with the badges of other users post more comments.	No
3b	<i>Social comparison: social interaction</i> The number of times a user views the badges of other users has a positive effect on the number of comments the user posts.	No
4a	<i>Social comparison: usage activity</i> Users who are enabled to compare their badges with the badges of other users generate more page views.	No
4b	<i>Social comparison: usage activity</i> The number of times a user views the badges of other users has a positive effect on the number of page views the user generates.	No
5a	<i>Clear goals: productive actions</i> Users who are enabled to have clear goals through badges create more trade proposals.	No
5b	<i>Clear goals: productive actions</i> The number of times a user views their own badges has a positive effect on the number of trade proposals the user makes.	Yes
6a	<i>Clear goals: quality of actions</i> Users who are enabled to have clear goals through badges complete more transactions.	No
6b	<i>Clear goals: quality of actions</i> The number of times a user views their own badges has a positive effect on the number of transactions the user completes.	Yes
7a	<i>Clear goals: social interaction</i> Users who are enabled to have clear goals through badges post more comments.	No
7b	<i>Clear goals: social interaction</i> The number of times a user views their own badges has a positive effect on the number of comments the user posts.	Yes
8a	<i>Clear goals: usage activity</i> Users who are enabled to have clear goals through badges generate more page views.	No
8b	<i>Clear goals: usage activity</i> The number of times a user views their own badges has a positive effect on the number of page views the user generates.	Yes

nisms. Several theories from motivational and social psychology were discussed as probable candidates to explaining the possible effects of gamification. Therefore, for further study, we suggest measuring latent psychological variables through surveys in order

to attain more accurate linkages between game mechanisms, psychological effects and resultant behavioral manifestations.

With regard to the present experiment, there is no way to infer directly whether the game mechanisms were able to arouse the

hypothesized psychological effects, such as social influence or goal commitment as the study investigated behavioral outcomes. Furthermore, the unsupported hypotheses do not imply that the hypothesized psychological effects do not exist, but rather that gamification failed to arouse such psychological effects in the sporadic utilitarian context of the experiment. We hypothesized that gamification would positively affect the number of productive actions users carry out within a utilitarian service. These hypotheses were mainly based upon the considerably hype in the service marketing sector (e.g., Gartner 2011). There was no strong previous scientific evidence on the effectiveness of gamification and instead the hypotheses here are more based on anecdotal evidence. Thus, this study, although confirmatory in nature, has to be regarded as exploratory at this stage of the research on gamification. From this perspective and taking into account more recent discussion on gamification (e.g., see Gartner (2012) which hints that 80% of gamified applications will fail), then the results might not be so surprising after all. Thus, it could have been equally hypothesized that there would be no effect. Positive results from mere implementation of gamification alone might have required more elaborations as to why such an effect exists.

In the case of Sharetribe, it is possible that badges do not offer that much value to users. In retrospect, it would have been more surprising to find that the mere addition of badges and enabling users to compare them and attain clear goals would have significantly increased usage activities in a service where people use the service only as much as they need to in order to carry out their sporadic trading. This utilitarian use though is not unique to the case service, and we believe that the results are generalizable to other utilitarian services. The results do, however, bring forth an interesting further question: How does gamification work in more hedonic services where people use the service not because of extrinsic reasons, but rather for its enjoyment value, and in services where users return to use the service because they either enjoy the activity or want to keep in touch with other people in the service.

It was also considered whether the measured dependent variables are truly representative of the possible user activities within the service and discussed the issue with the developers of the service. The dependent variables were deemed to well represent the entire variety of relevant actions available for users of the core activity of the service, including making trade proposals, carrying out trades and commenting on trade proposals. Furthermore, browsing trade proposals was measured by means of how many individual page loads users had made. We intentionally did not report whether the independent variables affected how many private messages users had sent to each other as there was no badge to be earned from sending messages and because the number of messages may have depended upon the other trade activity of the user. Similarly, we did not report how the number of badges was affected by the independent variables for the same reason and there was no significant relationship between the independent variables and the number of messages or the number of earned badges.

Although the data for the study were sufficiently large with regards to registered users, the number of times users have carried out different activities (dependent variables) on average is quite

low. See Table 8. This also further justified us to run extra analyses with a more active sub-sample in which users had an acceptable number of actions carried out. As reported above, this sub-sampling analysis work further strengthened the results.

Sharetribe represent a typical start-up looking to grow customer engagement via gamification (Zichermann and Cunningham 2011). The experiment conducted in this study well emulates a typical scenario where gamification is commonly implemented into a relatively new service with a relatively small initial user base. As discussed previously, it was found that only a relatively small portion of users became interested in badges, and therefore, we were unable to find support for the first hypotheses (marked with “a”) which pertained to the question as to whether the mere implementation of gamification is effective in encouraging overall user behavior. A probable explanation for the failed gamification implementations (e.g., Gartner 2012) in general can stem from the lack of interest toward such mechanisms when user motivations are otherwise extrinsic to the service itself, such as selling ones belongings. However, we did find that for those users who actively monitored their own badges, the usage activity was also higher. This suggests that in a large service with a larger user base, gamification can be highly effective since it will affect at least some proportion of the users.

7. Conclusion

This article reported results of a one and a half year-long field experiment on gamifying a utilitarian trading service by the implementation of badges, which have been considered the primary mechanism through which services have been gamified. This study was able to confirm that users who had actively exposed themselves to badges in Sharetribe were also significantly more likely to actively use the service, list their goods for trade, comment on listings and complete transactions. Furthermore, the results indicate that actively browsing other users' badges was positively associated with posting trade proposals in the service. However, support for the claims that implementing gamified features would alone lead to significant overall increases in usage frequency, quality or social interaction in a utilitarian trading service could not be found.

The unexciting result related to the lack of overall effects achieved by the introduction of gamified elements could be explained by several factors, such as a low *goal commitment* (Locke and Latham 1990, Klein et al. 1999) toward the badges, which was hypothesized to be a prerequisite for the badges to arouse the wanted effects. A low *goal commitment* could be explained by a number of different conditions within the gamified setting, such as the nature of the underlying service. It can be hypothesized for future studies that users in such a focused utilitarian service concentrate more on pre-meditated utilitarian activities and exercise a considerably more *cognitive involvement* rather than *affective involvement* (Zaichkowsky 1994). Therefore, hedonic service elements could be chosen to be ignored by the majority of the user population. For future studies, we suggest measuring the involvement of the users (Zaichkowsky 1994) and using it as a moderator for predicting *behavioral intentions* towards *continuous use*

Table 8
Means of the dependent variables in the data.

	3234 Users registered for experiment		723 Active users with > 100 page views	
	Mean	SD	Mean	SD
Trade proposals per user	1.03	3.24	3.77	6.05
Accepted transaction per user	0.47	1.51	1.87	2.72
Comments per user	0.65	2.45	2.59	4.60
Page views per user	103.47	259.35	399.80	434.99

intentions (Bhattacharjee 2011) and other measurements related to usage activities. We would also suggest in this context, that the direct measurement of *goal commitment* may provide useful information for future service development.

Another possible explanation for low *goal commitment* and *affective involvement* could be that badges were introduced long after the launch of the service. As such, the user population had not expected gameful interactions. If we consider popular gamified services, such as Foursquare, they have been advertised as gameful services from the outset, and consequently these services attract users who have preferences that match towards gameful interaction. Therefore, it might be easier to demonstrate the effectiveness of gamification in environments that have attracted a user population that would be receptive to gameful interaction. In the present experiment, gamification was implemented in a strictly utilitarian service where the user population had registered in order to trade goods and services, without any knowledge of the future implementation of gamified features. However, we suggest that further studies also be undertaken to investigate how temporal differences in implementation, affect the *technology acceptance* (Davis 1989) of gamified features.

Trading services can be seen to have patterns of sporadic use where users log into carry out pre-meditated searches for offers and to list their own goods or services. Gamification and badges, on the other hand, rely on persistence. Badges are reputation indicators and rewards that persist in the users' profile as a social indicator. However, in the larger context of the use of such services, their role might not be significant enough to fundamentally change the way these services are being used. It is conceivable that if the use of a service or a system is sporadic, then gamification might not be seen to hold enough value by the majority of users. The sporadic nature of such services also means that there are no peers who actively use the service for hedonic or social purposes and therefore the role of aspects related to *social comparison* (Festinger 1954) are diminished.

In the game context, however, badges seem to be a notable means for players' goal-oriented and social behavior. For instance, along with the publication of the FPS-game, Battlefield 3, EA Games also published a web service solely for monitoring and comparing player activities and badges. On the Xbox game console, every game publisher is required to implement badges in their games. In addition, it has been found that games with badges receive better ratings (Electronic Entertainment Design and Research 2007). Therefore, it seems that the effectiveness of game elements depends upon the nature of the service in which they are used, as well as the intentions and use scenarios of the users. The reason why people use different services can greatly differ between services that are of a different nature (van der Heijden 2004). Therefore, game mechanisms that are mostly hedonic are likely to provide little to the usage considerations of utilitarian services. This suggests that the gamification of utilitarian services might not be efficient unless the service also adds some hedonic emphasis, for example, by being gamified more consistently through perhaps narrative and other game mechanisms, or if the core activity within the service already resembles a game, which is the setting in which the use of badges seems to yield positive results.

In the field of game studies, there are two main perspectives by which games (and therefore gamification) may be defined: (1) *systemic* (Deterding et al. 2011) and (2) *experiential* (Huotari and Hamari 2012). The first approach defines games based on what elements or mechanisms their system has. Therefore, the addition of game mechanisms would (according to such an approach) transform services into games. However, the systemic perspective to gamification is in conflict with how we understand gameful experiences.

Gamification often attempts to direct user or consumer decision-making toward choices that are desirable to a third party. Games themselves, however, attempt to do the opposite. Games create choice spaces that are separate from deeply consequential outcomes (Caillois 1961). The enjoyment of games emerges from *mastering autonomous decision-making* activity, regulated by *free will* (Avedon and Sutton-Smith 1971, Ryan et al. 2006), rather than from the outcomes of that decision-making. In the same vein, Huotari and Hamari (2012) proposed that gamification then refers to design that aims to bring about these *gameful experiences*. In a common gamification implementation, however, the goals are strictly tied into the consequential utilitarian activities of the service, and this was also the case in this experiment. According to game theorists, this is a conflict that might negatively affect the general attitudes of users toward such an implementation. Therefore, we suggest that further studies be undertaken which measure the attitudes of users towards artificially assigned badges awarded for demonstrating certain behaviors within the service.

This conflict is also connected to a further issue. If we accept that gamification is about creating gameful experiences as the name suggests, and not just about directly increasing customer relationship metrics, then the successfulness of gamification should also reflect metrics that measure the user experience (see Huotari and Hamari 2012). Although, we may hypothetically find that gamification increased the retention of users and other usage activities, it would still be unknown whether users experienced gameful or playful experiences. Therefore, for further studies, we suggest focusing on the experiential aspects of such engagement, such as *perceived enjoyment* (van der Heijden 2004), *flow* (Csikszentmihályi 1990) and *playfulness* (Webster and Martocchio 1992, Martocchio and Webster 1992).

To conclude, this study proposes the following questions and lines of inquiry for research on badges and gamification. (1) How does the nature of the underlying service – *utilitarian* versus *hedonic* (Hirschman and Holbrook 1982, van der Heijden 2004) – affect *goal commitment* (Locke and Latham 1990, Klein et al. 1999) toward badges, and *attitude* towards gamification? (2) How does the *involvement* – *cognitive* versus *affective* (Zaichkowsky 1994) – of the user or consumer affect *goal commitment* and *attitude* towards gamification? (3) How do the temporal differences in the implementation or removal of the gamification affect *continuous use intention* (Bhattacharjee 2011)? (4) How does the level of *goal commitment* (Locke and Latham 1990) toward badges affect *continuous use intention* (Bhattacharjee 2011)? And (5), does the typical implementation of gamification mechanisms, such as badges, arouse experiences related to gamefulness and playfulness (Caillois 1961) and further promote hedonic use (van der Heijden 2004)?

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