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# **Crowdsourcing Goods Deliveries in Multi-Sided Markets – A Multiple Case Study**

Master's Thesis

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<p>Crowdsourcing is an intriguing option to carry out the last-mile delivery of goods. Due to the rising trend of ecommerce many companies face the pressure to offer home deliveries to their customers. However, companies still struggle to make these last-mile deliveries profitable due to the challenging optimization of distances between drop-off points and corresponding delivery times. Crowdsourcing tackles these obstacles by tapping into a large mass of individual deliverers and their unused resources, such as the leftover space in a customer's car. Indeed, crowdsourcing is proven to enable faster, and more cost efficient deliveries.</p> <p>Crowds have been exploited in a wide array of businesses but only recently has the trend of crowdsourcing goods deliveries emerged. Consequently, there exists only limited empirical research on the subject. Further, thus far the crowdsourcing literature has been mainly based on various applications on crowdsourcing product development. Hence, it is not yet fully understood how crowdsourcing goods delivery platforms engage their deliverers and grow the platform.</p> <p>The aim of this study is to analyse strategies that crowdsourcing goods delivery platforms adopt to realize network effects and engage crowds. This qualitative multiple-case study explores nine crowdsourcing goods delivery companies that operate solely as intermediaries that connect people who need something delivered with those who are able and willing to do the task. The data analysis follows Eisenhardt's (1989) instructions on building theory from case study research, deriving tentative findings within the individual cases and then comparing these emergent patterns across the cases. A framework was synthesized from recent crowdsourcing and multi-sided platform literature to focus the analysis on issues closely related to crowdsourcing platforms. The framework observes openness, pricing and governance strategies used by the platform owners.</p> <p>This study reveals strategies that the crowdsourcing goods delivery platforms adopted to build up a viable platform. They combined strategies that are typical of both multi-sided platforms and crowdsourcing environments. Further, my findings suggest that these platform strategies were used sequentially to address different challenges in the different phases of the case companies' life cycle.</p>		
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<p>Tavarakuljetusten joukkoistaminen on houkutteleva vaihtoehto kuljettaa verkkotilaukset asiakkaille. Verkkokaupan yleistyessä moni yritys on joutunut tarjoamaan kotiinkuljetuksia asiakkailleen. Kuljetusten toteuttaminen tehokkaasti on kuitenkin haasteellista tilauksien reitittämisen ja vastaavien aikaikkunoiden optimoinnin vaikeuden vuoksi. Joukkoistaminen vastaa näihin ongelmiin käyttäen hyväkseen suurta määrää kuljettajia ja heidän resurssejaan. Joukkoistamalla yritys voi esimerkiksi antaa verkkotilaukset kaupassa käyvien asiakkaiden kuljetettavaksi. Joukkoistamisen on todettu tekevän kuljetuksista nopeampia ja kustannustehokkaampia.</p> <p>Joukkoistamista on käytetty hyväksi monella alalla, mutta tavarakuljetusten joukkoistaminen on tullut vasta nyt mahdolliseksi. Aiheesta on tehty hyvin vähän empiiristä tutkimusta, ja joukkoistamista käsittelevä tutkimus perustuu pääosin avoimiin tuotekehityssovelluksiin. Aiempi tutkimus ei siis kerro, miten joukkoistetut tavarakuljetusalustat sitouttavat kuljettajia ja kasvattavat palveluaan tehokkaasti.</p> <p>Työn tavoitteena oli perehtyä strategioihin, joita joukkoistetut tavarakuljetusalustat käyttävät luodakseen kasvavan alustan ja sitouttaakseen käyttäjiään. Tämä kvalitatiivinen monitapaustutkimus tarkastelee yhdeksää yritystä, jotka joukkoistavat tavarakuljetuksensa yksityisille kuljettajille toimien ainoastaan tilauksien välittäjänä. Data-analyysi perustui Eisenhardtin (1989) tapaustutkimusmetodiin, jossa löydökset kerättiin aluksi yritystapauksista erikseen, jonka jälkeen niitä verrattiin keskenään eri tapausten kesken. Viitekehys piti analyysin rajattuna strategioihin, jotka liittyvät ainoastaan monipuolisiin markkinoihin ja joukkoistamiseen. Viitekehys koottiin vastaavasta kirjallisuudesta ja se keskittyy avonaisuus-, hinnoittelu- ja valvontastrategioihin.</p> <p>Tutkimus luettelee strategioita, joita joukkoistetut tavarakuljetusalustat käyttivät rakentaakseen toimivan alustan ja käyttäjäjyhteisön. Yritykset yhdistelivät strategioita, jotka ovat tyypillisiä käytettäväksi sekä monipuolisilla markkinoilla että joukkoistetuilla alustoilla. Lisäksi löydösteni perusteella näitä strategioita käytettiin vastaamaan eri kasvuvaiheiden tuomiin haasteisiin.</p>		
Avainsanat: joukkoistaminen, monipuoliset markkinat, monipuoliset alustat, tavarakuljetukset, ruokakuljetukset, joukkoistetut tavarakuljetukset		Julkaisukieli: englanti

## **Preface**

Many people have contributed to this thesis although only my name appears on the cover. First of all, I would like to thank my supervisor Robert Gustafsson for bringing out the best in my master's thesis. I am thankful to him for the discussions that helped me to focus my ideas and for carefully reading and commenting my text on multiple revisions of this thesis.

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# 1. Introduction

Exploiting crowds in goods deliveries is an intriguing opportunity for any business facing a pressure to offer last-mile and on-demand deliveries. It is still a challenge to deliver the last-mile in a profitable way due to difficult optimization of distances between drop-off points (Boyer et al. 2009) and corresponding delivery times (Punakivi & Saranen 2001; Boyer et al. 2009). In crowdsourced deliveries, however, these obstacles are overcome by tapping into large masses (Brabham 2008) and their unused resources (Owyang 2014). A leftover space in an existing customer's car, for instance, is an example of unused resource that is an advantage impossible to be imitated by traditional logistics. Crowdsourcing also provides new opportunities to improve overall efficiency by reducing fixed costs, such as employees and owned vehicles. Further, exploiting a large base of collaborators potentially speeds up production (Satzger et al. 2013; Kohler 2015).

Although crowdsourcing is not a novel phenomenon, only recently has the possibility of crowdsourcing the goods deliveries become viable. The main drivers, the widespread mobile technologies (Rougès & Montreuil 2014; Owyang 2014), the social networks (ibid.), the Internet of Everything (Owyang 2014) and Web 2.0 (Kleemann & Voß 2008) have enabled platforms to reassign the challenging on-demand and last-mile deliveries for crowds to handle. These technologies have facilitated managing communication and interactions between people (Kleemann & Voß 2008), which has led to the emergence of novel applications in crowdsourcing. For example, only during the recent years has the transportation industry been famously disrupted by new players exploiting crowds, such as Uber and Lyft.

As attractive as it may appear, turning a business model into a fully functional and viable crowdsourcing platform is a challenge. Firstly, any crowdsourcing platform should engage a crowd that is both willing and able to participate in value creation (Kohler 2015). Secondly, as these platforms connect two or more entities whose participation is dependent on the other side, managing the platform becomes even more complicated. Value for one entity tends to increase with the size of the entity on the other side (Hagiu 2014; Evans 2003; Kohler 2015). But an unbalanced platform, where one user group becomes too large, could result in excess competition on one side, which in turn lowers

the value of the platform (Eisenmann et al. 2006). Moreover, as there are multiple entities of users, there are, naturally, multiple conflicting interests (Hagiu 2014). Thus, on a more granular level, managing a platform involves matching needs of various users in a sustainable manner. Finally, the crowdsourcing is still a new concept especially in the goods deliveries domain and people might be unwilling to let a random person to deliver groceries, for instance. Hence, crowdsourcing goods delivery platforms still need to win the trust of consumers by proving that they are capable of offering the same quality that traditional logistics companies offer.

What are the strategies for exploiting the necessary network effects and to engage crowds on a crowdsourcing goods delivery platform, then? There is little we know about the strategies used in the crowdsourcing in the services domain and in the domain of goods deliveries, in particular. Prior literature on crowdsourcing has mainly discussed the phenomenon in the product development, where open source software projects (Boudreau & Hagiu 2008) and problem solving, innovation (Satzger et al. 2013), and product design competitions (Kohler 2015) have provided the base for empirical research. In addition, only limited empirical research (e.g., Rougès & Montreuil 2014; Sadilek et al. 2013) explores the crowdsourcing goods deliveries. In their study, Rougès & Montreuil (2014) contribute toward a better understanding of value creation in crowdsourcing goods delivery companies. Based on their sample group's daily driving habits, Sadilek et al. (2013) prove that packages can be delivered with remarkable speed and coverage using a crowdsourcing based delivery model. Thus, prior literature does not provide insights into what makes the crowdsourcing goods delivery platforms viable.

Further, crowdsourcing platforms operate in multi-sided markets, and yet it is unclear how to apply corresponding multi-sided platform (MSP) strategies to crowdsourcing environments. The MSP strategies discussed in the respective literature aim at realizing, maintaining and internalizing network externalities and controlling interactions between multiple divergent entities. Strategies discussed in crowdsourcing literature, in turn, aim at engaging only one entity, the crowd, and controlling quality of the co-created outcomes of only that one entity.

To address the research gap, this qualitative empirical study explores strategies used to create a viable crowdsourcing goods delivery platform by studying nine goods delivery companies that work as an intermediary between the customers and delivery agents. The

aim of the interviews was to explore the strategic choices that the case companies had taken in their platform design and that contributed to platform viability and growth.

The interviews were analysed following the Eisenhardt's (1989) instructions on building theory from case study research. I first explored the strategies and their antecedents in each case separately. Next, I compared these emergent patterns across cases to generalize and validate findings. A synthesised framework derived from recent crowdsourcing and MSP literature guided the analysis. The framework aided in evaluating the strategies related to platform openness, pricing and governance, which can be divided further into regulation of access and interactions and controlling creation.

The study reveals multiple strategies that crowdsourcing goods delivery companies used to engage crowds, realize network effects and maintain quality. The crowdsourcing goods delivery platforms combined strategies typical of crowdsourcing and MSPs. However, also strategies that were not identified for crowdsourcing or MSPs in prior literature emerged in the analysis.

The results show that most of the case companies preferred building a viable platform even at the cost of growing slowly. Firstly, they controlled growth through restricted geographical access and imposed vetting and training processes for the deliverers. These measures limited growth but helped growing a viable platform by securing beneficial connections between the users.

The results also suggest that the use of the platform and crowdsourcing strategies is dependent on the stage of the platform life cycle. In the early phases of the platform life cycle, some of the case companies subsidized the deliverers while others were holding the monetization of the service in order to gather a sufficient amount of users required for securing network effects on the platform. While the market was evolving, the crowdsourcing goods delivery platforms started to subsidize the customers with lower prices. The cost of subsidizing was covered by lowering the deliverer remuneration or by including retailers that paid commission for the deliveries. When the volume eventually soared, the platforms moved away from crowdsourcing model where voluntary choice of tasks entailed unreliable deliveries. Instead, they employed some of the deliverers, separated picking phase as an isolated process and controlled the coupling of tasks and deliverers to gain higher efficiency, reliability and availability.

This study has theoretical and practical implications. First, I synthesize a framework that facilitates the structured analysis of strategies in crowdsourcing goods delivery platforms. Second, the study reveals strategies that crowdsourcing goods delivery platforms adopted and their motives. The findings show the strong influence of scale on strategic choices on platforms that prior research on the subject neglects. Further, these emergent strategies represent important practical managerial implications also for organizations that are considering exploiting crowds in their activities and for players experimenting new applications in crowdsourcing environment.

## **2. Literature review**

In the study, I derive the supporting theory from two rich fields of research, which I discuss in this section. In the section 2.1, I discuss the crowdsourcing environments and how crowds can be exploited in business. In the following section, 2.2, I explain how multi-sided markets affect to crowdsourcing platforms. In the section 2.3, I discuss the trade-offs of different platform designs. Next, the section 2.4 explains how crowdsourcing platforms engage their crowds in multi-sided markets. The section 2.5, in turn, goes through strategies that crowdsourcing platforms use to control quality. Lastly, in the section 2.6, I present the research gap derived from preceding sections and form two research questions to address it.

### **2.1. Crowdsourcing in business**

In their frequently cited article, Estellés-Arolas and González-Ladrón-de-Guevara (2012, pp. 197) define crowdsourcing as “a type of participative online activity in which an individual, an institution, a non-profit organization, or company proposes to a group of individuals of varying knowledge, heterogeneity, and number, via a flexible open call, the voluntary undertaking of a task”. In this study, I refer to the former, proposing party as *crowdsourcer* and to the latter, proposed party as *crowds*. The definition varies in literature and crowdsourcing may also refer to an activity practiced solely by profit-oriented companies (Kleemann & Voß 2008; Howe 2006). In the master’s thesis, however, I refer to the previous, broader view, as the crowdsourcing models and relationships between different entities in MSPs may be more complex.

Companies can fundamentally change their business model by leveraging crowds. In essence, they may outsource a function once performed by employees to an undefined network of people (Howe 2006). A company, as a crowdsourcer, can exploit crowds to create value, from which it captures a share of profit and shares the revenues with the crowd (Kohler 2015). Apart from the economic compensation, these rewards for the crowd can come in the form of social recognition, self-esteem, or the development of individual skills (Estellés-Arolas & González-Ladrón-de-Guevara 2012). The advantages of crowdsourcing are used to deliver a company’s products and services in a more efficient, effective, reliable, personal, or faster way (Kohler 2015).

Indeed, the advantages of crowdsourcing are numerous. Firstly, a crowdsourcer may improve quality of its products and services by using consumer knowledge. By crowdsourcing its traditional development activities, a company is, in fact, outsourcing its processes to its customers, as the customers and the crowds that are creating the value can be overlapping groups of people. Thus, the customers use their own preferences and knowledge in creating value, products and services. Hence, a very compelling value proposition is created. (Kohler 2015; Kleemann & Voß 2008)

Secondly, crowdsourcing may improve overall efficiency by reducing costs and increasing productivity. A company can avoid high fixed costs by replacing employees with independent contractors. Collaborating with a large amount of these contractors also potentially reduces the time spent in developing (Satzger et al. 2013; Kohler 2015; Kleemann & Voß 2008). A large amount of contributors developing designs for a product leads into a vast amount of ideas in short time. The crowdsourcers has to then solely develop a system to pick the best solution and, perhaps, deliver it to the end customer. Further, applying the attractive reward mechanisms potentially results in remunerating these individuals significantly less for the contribution than it is worth for the firm (Kleemann & Voß 2008).

Moreover, crowdsourcing companies move some of the risks to the collaborators. In product development projects where crowds take part into the design phase the customer commitment is gathered before the product is manufactured (Kohler 2015), which partly ensures the future sales. The individual collaborators also take the risks associated with possible unexpected costs of value creation by using their own resources. If a crowdsourcer promises a certain reward for a task, the individual who carries out the task takes the risk in profitability, as he or she receives the same reward despite the amount of time and effort he or she put into the task.

## **2.2. Crowdsourcing platform in multi-sided markets**

Crowdsourcing platforms connect two or more user groups, such as the crowds and the end customers. For example, one of the largest crowdsourcing platforms, Amazon Mechanical Turk (AMT), allows any company to distribute simple tasks for regular people to perform (Satzger et al. 2013). Similarly, Yahoo Answers!, a questions and answers portal, connects people who ask questions with those who answer the questions.

A common denominator for these two platforms is that they both connect multiple sides and operate themselves solely as intermediates.

Therefore, instead of considering crowds as a stand-alone entity, they should be viewed as a part of a platform that incorporates multiple user groups that have their own distinct roles and incentives. In these multi-sided platforms (MSP) crowds are not the only user entity to be engaged. In effect, in MSPs, the opposite user groups attract each other, and the platform provider, who manages the platform, only enables interactions between them. Therefore, it is necessary to understand how other external user groups affect the crowds' participation and how the monetary benefits are designed so that they attract all the users groups, not just the crowds.

MSPs coordinate, in essence, the demand of distinct groups of customers who benefit from each other in some way (Evans 2003). More specifically, MSPs are technologies, products or services that mainly create value by enabling direct interactions between two or more customer or participant groups (Hagiu 2014). When MSPs are able to successfully connect distinct participant groups with complementary needs, the platform creates significant value to the participants groups due to reduced search costs and transaction costs (Hagiu 2014). Hence, the platform users do not need to search and transact with multiple partners separately through different platforms but allocate all the interactions through one platform, instead.

Network effects, which illustrate the tractive forces between the distinct user groups, are the foundation of MSPs. A MSP realizes cross-side network effects and increases social surplus, if it is able to internalize the one participant group's existing externalities for another (Evans 2003; Liebowitz & Margolis 1994). The higher the number of the participants, the more opposing sides benefit from each other and the value of the platform increases (Hagiu 2014; Evans 2003; Eisenmann et al. 2006). For instance, in crowdsourcing goods delivery platforms, increase in the amount of deliverers would provide more frequent deliveries, which yields higher value for the ordering customers. The increase in the amount of customers, in turn, provides deliverers the better opportunities to earn. Consequently, the cross-side network effects eventually grow the platform, as opposite user entities attract one another.

A growing platform enjoys increasing returns of scale. Users are willing to pay more for joining into a larger network (Eisenmann et al. 2006) as it offers more value to them. Economies of scale may also lead to significant barriers to entry for other players, which allows the platform to gain a superior position in the market (Hagiu 2014).

Therefore, achieving desired network effects is the most critical goal for platform providers. Firstly, attracting all the sides onto the platform is a challenge for every MSP in the early phases of their life cycles. Because none of the sides will join without the users on the other side, the problem is to get enough of initial users on one side, i.e., the critical mass to join the platform. Cross-side network effects ensure that critical mass attracts more participants on the other side (Hagiu, 2014; Evans, 2003; Eisenmann, Parker and Van Alstyne, 2006). This results in a self-reliant platform, which grows on its own.

Secondly, MSPs need to avoid the negative network effects. Negative same-side effects realize when interactions are negative and harmful. They may surface due to low quality on the platform or excess competition. For example, a large amount of users on one side leads to excess competition, which again leads to lower profit margins and value for the users (Hagiu 2014; Eisenmann et al. 2006). Harmful connections and interactions between the users of different sides, in turn, lead to negative cross-side network effects that prevent platforms from growing. In the case of the crowdsourcing goods delivery platforms, too many deliverers on one side, which denotes lower profits, and low quality of goods deliveries lead to negative network effects.

### **2.3. Platform design and its openness**

For platforms, perhaps the most prominent strategic decision is how many sides to include on the platform (Rysman 2009; Eisenmann et al. 2008). Rysman (2009) refers to this initial platform design decision as openness. Apart from how many sides to pursue, openness refers also to decisions over how a platform relates to competing platforms (Rysman 2009). It may choose to be compatible with competing platforms or even integrate with them.

Contrary to access regulation, which I discuss later, openness does not regulate the access of single users of a user group. Instead, it involves strategic decisions whether to open an access for a user group, such as deliverers, consumers, advertisers or retailers, with a

specific task and role onto the platform. The more open the platform is, the more sides, i.e., distinct user groups, it hosts. In the case of delivery services, an open platform would have deliverers as their own separate, crowdsourced entity in addition to orderers and retailers. On the contrary, if a platform is more closed, it might serve only one side, e.g., customers, and in turn maintain deliverers as their own employees. Thus, the strategic decisions addressing the platform openness determine how many user entities a platform should have when pursuing growth and quality. Platform openness has a fundamental effect on the pricing and governance strategies.

Platform providers are able to alter openness. They may open an access to the platform for a new participant group or alternatively close the access for the existing side (Eisenmann et al. 2008). By closing platform for a side the platform continues offering their products and services as its own operations (Hagiu 2014; Eisenmann et al. 2008; Rysman 2009). In practice, closing denotes acquiring a side by hiring its participants, for instance (Hagiu 2014) or developing own capabilities to offer the same products and services (Eisenmann et al. 2008).

Closing a platform can also be partial. For instance, many of the Windows OS's software applications, such as web browsing, disk management and streaming media, used to be provided solely by third parties. However, Microsoft started to develop its own applications in parallel with the third party developers. Eisenmann et al. (2008) refer to this strategy as closing the platform, as the participants of the respective side find it more difficult to compete once the platform provider offers a substitute.

Openness yields significant economic trade-offs. On the one hand, more sides lead to potentially larger cross-side network effects, larger scale and diversified sources of revenues (Hagiu & Wright 2015; Hagiu 2014). On the other, more sides may also create excess complexity on the platform and entail conflicting interests between the sides (ibid.). Further, if a platform decides to outsource activities that it previously had under its own control to an external user group, it loses the control on the quality of the products or services (Hagiu 2014).

Therefore, a crowdsourcing goods delivery platform may want to alter platform openness throughout the platform life cycle to pursue different strategic goals. In general, platform providers can increase supply by operating on the side where the amount of participants is

still insufficient to attract the other side and create strong network effects (Hagiu 2014; Rysman 2009). Once the network effects are realized and there are enough participants on both sides for the platform to keep on growing the platform provider can start to operate as a sole intermediary. Similarly, crowdsourcing goods delivery platforms would be able to offer the deliveries themselves from the beginning until the amount of crowdsourced deliverers is sufficient for providing frequent deliveries, thus higher value, for the end customer.

## **2.4. Strategies to engage the crowds and realize network effects**

As the company benefits from the crowd, the crowd has to benefit from the company. If a crowdsourcing business fails to engage the crowds, the advantages of crowdsourcing will not realize. Crowdsourcers may engage their crowds both with monetary rewards and rewards that address crowds' intrinsic motivation. In multi-sided markets, the rewards have to be designed in a way that they do not attract only the crowds but also the end customers and perhaps other user entities.

### **Pricing strategies**

One way to engage the crowds is to create attractive monetary incentives onto the platform. In crowdsourced-based businesses, this pricing challenge culminates into questions what is the value created in the collaboration that is charged from the end customer, and what are the rewards or shares of revenues distributed to the crowds (Kohler 2015). Because individual creators choose the tasks voluntarily, it is difficult to determine a sufficient reward or remuneration that motivates the creator but is not too high for the crowdsourcer that aims at turning a profit, either (Satzger et al. 2013). The crowdsourcer has to take the nature of the task, external factors, such as number of available workers, and environmental influences, like weather, into account. However, the pricing mechanism can also be based on an open pricing model where users determine the prices themselves thus relieving a crowdsourcer from defining the monetary reward in advance (ibid.).

In multi-sided markets, on the other hand, the price is also dependent on how participation of users on one side affects the participation on the other and how much profit can be extracted from the participation (Rysman 2009). In fact, the price for one

side might be even lower than the marginal cost for that side (Parker & Alstynne 2003; Rysman 2009). Indeed, MSPs need to offer the product or a service for free or at subsidized prizes to at least one side of the platform in order to attract the initial users (Hagiu 2014; Evans 2003). To cover the cost of subsidizing, the platform charges the other side(s) more, which makes them the money-side (Hagiu 2014; Eisenmann et al. 2006). Hence, in their pricing strategies, MSPs divide their users into the subsidy side users who in large numbers attract the other, money-side.

There are multiple factors to concern when determining an optimal pricing strategy for a multi-sided crowdsourcing platform. Firstly, the platform should identify the money sides and the subsidy sides. The former gets charged more, as the users on this side are the ones that benefit the most from the other sides or are capable of charging the other sides more (Hagiu 2014; Armstrong 2006). The latter, in turn, consists of the most price-sensitive users or users that provide large externality and value for the other sides on the platform (Hagiu 2014; Rysman 2009). Thus, they should be subsidized by offering them lower prices or higher remuneration (Armstrong 2006) or by strongly supporting and investing in their creation activities (Evans 2003). Therefore, subsidy side represents the critical mass that needs to be attracted first to join the platform in order to encourage the other groups' participation. This form of subsidy pricing is common and necessary for MSPs in the early phase of the life cycle to create initial user base, which is then capitalized later (Rysman 2009). However, for crowdsourcing goods delivery platforms, it is still unclear which one, the delivering crowds or the ordering customers, is the subsidy side and which one is the money side.

Secondly, the money and subsidy sides might change when the market evolves, which affects the pricing. The platform might attract extremely valuable users onto the platform, which reduces the prices or increases remuneration for the users on the respective side (Evans 2003; Eisenmann et al. 2006). MSPs may also need to increase the level of quality, which they tend to do by charging more the side that is needed to produce high quality, as high initial investments help weed out the low quality players (Hagiu 2014). This way pricing has additional quality benefits as it can be used also to regulate access to the platform, as I will discuss later.

## **Non-pecuniary rewards**

However, achieving strong engagement in the crowds requires also implementing non-pecuniary incentives (Boudreau & Hagiu 2008). Indeed, pricing mechanisms are inefficient tools when engaging and motivating people. In addition to the monetary incentives, rewards may address crowds' intrinsic motivations, such as social recognition and skill development (ibid.). Engagement further increases, if the crowds are also affiliated with the community (Boudreau & Hagiu 2009; Kohler 2015) or attracted by the opportunity of working flexibly according to their individual habits, e.g. working hours (Satzger et al. 2013).

For example, TopCoder, a vendor of outsourced software project, has been able to engage a community of 20 000 actively contributing developers in regularly organized contests. The community takes part into contests where they compete on developing software according to software buyer requisites. Winners receive cash prizes that vary between hundreds up to millions of dollars. Yet, TopCoder ends up paying less than it would have paid for all the joining developers. Most contributors do not receive anything and still they are engaged to continuously take part into the contests. TopCoder is engaging coders with non-pecuniary incentives intrinsic motivation that are typical of coder communities, such as learning, status and recognition and affiliation with the community. (Boudreau & Hagiu 2008)

Sometimes even the freedom and the flexibility of working in crowdsourced-based models seems to attract crowds as such. Amazon Mechanical Turk (AMT) allows companies to distribute simple tasks with short description onto their platform where individuals execute them. The tasks include transcribing short interviews and textual analyses of pictures, which still human performs better than a computer. The rewards are relatively low, from \$0.02 to few dollars (Ipeirotis 2010), but motivators such as being productive (Kleemann & Voß 2008) and working flexibly with occasionally appealing tasks (Satzger et al. 2013) has attracted 250 000 crowdsourcing workers on AMT's platform (ibid.).

Crowdsourcers may also engage the crowds by amplifying exemplary behavior, which also contributes to higher quality. Kohler (2015) states that in order to engage the crowd and ensure high quality output crowdsourcing platform should empower and give

recognition to the best performing individuals and their work in order to amplify their behavior in others in the community and give incentives for the crowds to improve. For instance, in their auction-based crowdsourcing model, Satzger et al. (2013) motivate the crowds by integrating assessment of tasks into the model in order to encourage skill development within the community. Similarly, Yahoo Answers! amplifies desirable behavior by giving points to users who answer to the questions and reducing points from those who ask them (Satzger et al. 2013). The mechanism encourages users to also answer to the questions and not just ask them.

## **2.5. Strategies to control quality on crowdsourcing platforms**

Ensuring quality on crowdsourcing platforms is challenging but necessary. Low quality creation on the platform does not make the market unattractive only for the end customers but also for the participants to produce high quality products and services (Hagiu 2014). Strength of the network effects is not only determined by the number of users and the interactions between them but also by their quality (ibid.). Thus, low quality on the platform might lead to negative network effects that eventually result in network failure, where the platform fails to engage and attract its users.

There are at least three aspects typical of crowdsourcing platforms that affect quality of the co-created product or service. First, easy access onto a platform makes managing tasks and assuring quality challenging. On the one hand, by keeping the platform accessible crowdsourcers are able to benefit from large masses of co-creators with different knowledge and interests. On the other, an easily accessible platform might lead to a heterogenic mass of creators who may join and leave at any time, which complicates manageability of the tasks (Satzger et al. 2013). The unrestricted access also attracts undesirable participants that produce low quality, which might result in harmful negative connections between the platform users (Boudreau & Hagiu 2008).

Second, there are limitations to what extent the crowd can deliver value. The limitations include the requisite qualifications for performing certain high-sensitivity tasks and crowds' limited expertise and knowledge, which tends to relate only to the visible part of a crowdsourcing company's business. Thus, crowds might disregard the possible other insights into the business that are available for its employees. (Kleemann & Voß 2008)

Third, loose coupling of the tasks and the crowdsourcing individuals contributes to low quality. In crowdsourcing platforms, the crowds may choose the tasks themselves, whereas in companies tasks are usually assigned straight to the employees. Voluntary booking of a task does not take the individuals' abilities or the fit for the task into account, only their own preferences and willingness (Satzger et al. 2013). Hence, quality of performance varies significantly on a crowdsourcing platform, as coupling is more difficult to control.

Crowdsourcing platforms address these issues with various quality governance strategies. They can be divided into strategies regulating access, which involves determining the users who can join the platform (Hagiu 2014), regulating interaction, which involves controlling and restricting interactions between and within the entities on the platform (Hagiu 2014), and controlling creation of crowds on the platform (Boudreau & Hagiu 2008). These strategies ensure positive network effects on the platform and help in engaging users in order to make the platform grow.

### **Regulating access**

Quality may be governed proactively by regulating access. The principal idea in regulating access is to ensure the suitability and the fit of all the members on different sides of a platform. By attracting only the right participants the likelihood of relevant connections between the users of opposing sides increases while the amount of negative interactions with potentially undesirable members decreases (Boudreau & Hagiu 2008). For instance, in crowdsourcing goods delivery platforms, relevant connection would realize between an orderer and a deliverer that are located close to each other. Contrary to openness strategies, regulating access simply concerns restricting single users' access to the platform and does not involve determining the total number of the sides on the platform.

In addition to ensuring desirable connections between the members of different sides, access regulation can also be used to avoid negative same-side network effects from realizing. Sometimes the number of members on one side of the platform may increase to excess leading into fiercer competition and thus downward price pressure and shrinking margins (Eisenmann et al. 2006), which in turn might reduce the incentives for member to invest in quality (Hagiu 2014). Positive network effects may turn into negative ones

that could lead into a market failure when grown strong. Therefore, regulating access by deliberately reducing the sheer number of participants on one side is necessary in certain conditions in order to maintain the network effects strong and positive (Eisenmann et al. 2006).

Measures to restrict access vary and are dependent on the context but their main goal is to ensure the participant fit. Similar to crowdsourcing goods delivery services, Uber, a crowdsourcing taxi service that connects passengers and drivers, screens the driver applicants with background checks. The background check is also followed by a short online training. eHarmony provides an example of two-side market that connects people to arrange a date. The platform ensures the participant fit by requiring applicants to complete a survey of 250 questions and then refusing the membership if they do not suit the platform's requirements.

### **Regulating interactions**

Regulating interactions is the more nuanced counterpart of the access regulation. It aims to achieve desired behavior in platform participants and in the interactions between them in order to realize positive network effects (Boudreau & Hagiu 2008) or simply to turn a profit. Platform providers can prevent some interactions totally or just restrict them.

Regulating interaction addresses many challenges created by constantly growing platform. Firstly, a crowdsourcer may prevent interactions to support only positive connections. To avoid negative connections crowdsourcers may, for example, control the distribution of tasks to the individuals based on their abilities, the previous performance and other metrics (Satzger et al. 2013). The crowdsourcer thus restricts the interactions with those who are not suitable for the task or who usually produce low quality. Distributing the tasks in a more beneficial manner does not only contribute to quality but also to profitability. The approach also amplifies desirable behavior and thus engages crowds, as described earlier.

Secondly, crowdsourcers can also totally prevent members of one side from interacting with the members on the other side. For instance, to ensure quality, the platform provider may want to audit the quality of the products created by crowds and verify whether the outcome qualifies for passing it to the end customer (Boudreau & Hagiu 2008). Crowds are thus exploited in value creation but they do not interact with the final customer.

Hence, in crowdsourcing-based businesses, regulating interactions is an effective strategy for controlling quality. The platform is capable of controlling and enhancing the outcome prior to delivering, or selling, it to the end-customer by limiting the relationships between the sides (Kohler 2015).

### **Controlling creation**

To achieve higher quality crowdsourcing platforms also tend to impose control over the crowds' creation. Creation refers here to the crowds' value creation processes. In the crowdsourcing goods delivery platforms creation consists of activities related to picking and delivering the customer orders. The goal of imposing control on creation is to improve quality and make creation more efficient. Creation refers to the activities and work performed out by the crowds.

Strategies for controlling creation restrict the variety of ways crowds may carry out the task, which improves manageability of crowdsourcing project. Controlling creation may occur as systemized production where a crowdsourcer organizes the work in more beneficial manner. For instance, crowdsourcing platform TopCoder has divided the customer projects into sequential, more manageable tasks. In addition to the software development, the company holds contests on software architecture, software design and testing. Thus, TopCoder is able to harness crowds in different part of the value chain making the creation processes more manageable and efficient. (Boudreau & Hagi 2008)

Crowdsourcing platforms' focal strategies should concern engaging the crowds and controlling the quality. To engage the crowd, platforms need to create the right pricing and rewarding mechanisms. The former involves defining the sufficient pay for the individuals whereas the latter consists of intrinsic motivations, such as learning and desire for social recognition, and is more nuanced and more challenging counterpart of pricing in the platform design. Quality, on the other hand, tends to be maintained by regulating interactions between the customer and the crowds, regulating access to ensure the suitability of the participants and controlling the creation process of the crowds.

## 2.6. Research questions

The theory section yields an interesting research gap. There is little we know about crowdsourcing in the service domain and in the domain of goods deliveries, in particular. Prior empirical research and the theory on crowdsourcing presented in the previous section are limited to crowdsourcing product development applications. Crowdsourcing research mainly stems from various real-life applications in product development and configuration (Kleemann & Voß 2008), such as open source software projects (Boudreau & Hagiü 2008), problem solving, open innovation (Satzger et al. 2013; Brabham 2008) and product design competitions (Kohler 2015; Kleemann & Voß 2008).

Crowdsourcing in the services domain and in goods deliveries, in particular, differs significantly from crowdsourcing product development practices. Unlike in product development, in goods deliveries interactions and exchange of goods between the crowds and the end customers are inevitable and, to an extent, beyond control of the platform providers in the service businesses. Crowds need to deliver the goods to the end customer, which makes quality control challenging, as the crowdsourcer is not able to inspect the quality during this exchange. In crowdsourcing product development, in turn, crowds are capable of working independently in isolation and do not necessarily need to interact with an end customer in order to carry out the task. For instance, in integrator platforms (coined by Kohler 2015), the crowdsourcer, is able to evaluate the quality of the co-created product prior to selling it to a end customer. The crowds execute the tasks in isolation from the end customer. Therefore, it is unclear how crowdsourcers operating in the services domain and in goods delivery platforms, in particular, are able to apply strategies used in crowdsourced product development.

Furthermore, crowdsourcing goods delivery platforms tend to operate in multi-sided markets. Platforms multiple sides affect each other positively growing the platform or negatively making the platform less attractive for its users. Crowds are thus only one side that needs to be considered when building a functioning, viable platform. It is not yet perfectly understood how crowdsourcing goods delivery platforms may apply common MSP strategies, i.e., openness, pricing and governance strategies, to crowdsourcing environments, and vice versa.

To explore this research gap, I form two research questions that aim at understanding the strategies used in crowdsourcing goods delivery platforms and the reasoning behind the strategic decisions:

*Q1. How do crowdsourcing goods delivery platforms engage their deliverers, realize network effects and control quality in multi-sided markets?*

*Q2. How do the platform strategies change throughout the life cycle of a crowdsourcing goods delivery platform?*

### **3. Research methods**

The aim of this multiple-case study is to explore the strategies that crowdsourcing goods delivery platforms use to engage users, realize network effects and control quality in multi-sided markets. I use the synthesized framework, presented in the theory section, to inspect how openness, pricing and governance strategies, are applied to the crowdsourcing platforms that operate in the domain of deliveries. The objective was also to understand the reasoning behind these strategic decisions and how they change throughout the platform life cycles.

This section presents the approach I adopted to explore these strategies and answer the two research questions. First section, 3.1, presents the research context. The following section, 3.2, describes the data collection procedures that involved choosing the nine case companies, conducting the interviews and triangulating the tentative results with archival data. Lastly in 3.3, I explain the data analysis process which was an iterative process following Eisenhardt (1989) instructions on building theory from case study research.

#### **3.1. Research context**

This study explores strategies used in nine crowdsourcing platforms organizing delivery of goods, which include groceries, restaurant food and other goods. The platforms do not deliver the goods themselves; instead they solely match users who need any goods delivered with those who are willing and able to deliver them. The case companies operated in the domain of goods deliveries but had slightly different business models. Seven of the case companies were crowdsourcing their deliveries to the individuals, one company exploited a large pool of part-time employees and another passed customer orders for a large base of existing delivery companies. A common denominator between all of the companies, however, was that they all operated in multi-sided markets, connecting at least two distinct participant groups. Although all of the companies were less than five years old, they ranged from those still operating with seed capital and in one city to those funded with millions of dollars and operating in multiple markets. The companies were also based in different geographic locations in North America and Europe.

Crowdsourcing goods deliveries are still a nascent market, where the best practices are still explored and that is characterized by several entrants experimenting with different business models. As typical of nascent markets, the fast industry growth has been allowing the players to grow with it without facing intensive competition yet, though crowded with new entrants. However, many of these entrants will sort out during the process, and only few will grow to a leading position. The emergence of wide body of players in the industry is mainly driven by novel mobile technologies, innovative applications in social networks and increased start-up funding.

Crowdsourced deliveries represent only one branch of the growing collaboration economy currently led by Uber, AirBnB, Instacart and alike. The collaboration or the sharing economy is filled with successful and notorious examples of how crowds can be harnessed for business. The industry is still in its infancy and the players are facing several complications and legislative constraints. Although the market has predominantly been growing with the leading players, people's preferences towards sharing economy and legislative factors still hinder the growth.

### **3.2. Methodological approach**

I chose the qualitative case study method to approach exploring the research gap. Case studies are the optimal strategy for exploring phenomena in real-life contexts (Yin 2003). Case studies are also preferred when answering to “how” and “why” questions. These questions are explanatory by their nature and address causal relationships (ibid.) Cases and, for instance, conducting interviews enable the access to explore these relationships. The qualitative methods, in turn, are used to understanding why or why not the relationships hold (Eisenhardt 1989). Thus, qualitative case study is optimal when exploring strategic decisions and their antecedents in real-life environments.

Although this study is based only on nine companies, they provide basis for generalizable theory. A common prejudice against the case study strategy is that such limited empirical data would not provide sufficient basis for scientific generalization (Yin 2003; Eisenhardt & Graebner 2007). However, findings derived from a case study can be generalized to other situations through analytic generalization (Yin 2012). Analytic generalization stems from study's theoretical framework to establish a theory that could be applicable to other situations (ibid.).

Furthermore, choosing multiple cases improves the theory's generalizability. Multiple-case study enables comparison of cases to reveal whether emergent findings recur in several cases or is idiosyncratic to a single case (Eisenhardt & Graebner 2007). Each new case may be used to support, reject or shape tentative propositions that emerge from individual cases (Eisenhardt 1989). Accordingly, this study's data analysis involves both within-case and cross-case analysis of nine cases, as described later in this section.

### **3.3. Data collection procedures**

I embarked on the selection of case companies with wide exploration of players in the crowdsourcing delivery ecosystem in different geographic markets. The aim was to find more than six companies that exploited individuals (referred as crowdsourcing) in organizing deliveries of goods and only operated as intermediaries between these individuals and the parties that needed something delivered. Preferably, the prospect case companies should also use novel technologies, such as mobile platforms, in matching these two entities. Thus, I used sources like Investors' Angel<sup>1</sup>, CrunchBase<sup>2</sup> and other websites focused on start-up funding from different countries in Europe and North America to find newly established and funded companies from this nascent market.

After a vast search I narrowed down the number of prospect case companies. I defined a high-level outline of companies' business models based on archival data such as companies' web sites and media articles to be able to categorize them and confirm that they were crowdsourcing delivery platforms instead of traditional delivery services. I sorted out the companies that were no longer active in order to be able to arrange the interviews (except for the company, pseudonym IndigoDeliverer that had been ceased but been a part of a larger organization and thus provided a potential case to explore antecedents of a market failure). In addition, some of the companies had employed their crowdsourced deliverers under a full-time employee contract. However, these companies were not excluded since they represented an apparent phenomenon in the industry. Finally, 50 potential case companies and an array of different business models were identified. I categorized the companies into crowdsourced grocery, restaurant and local goods delivery platforms and crowdshipping platforms. I did not limit the number of

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<sup>1</sup> <https://investorsangel.com>

<sup>2</sup> <https://www.crunchbase.com>

potential case companies more at this phase yet, as I would need to narrow it down due to the companies' reluctance to be interviewed and share information about their business.

The search for prospect case companies was followed by the inquiry phase. I started contacting the potential case companies by sending inquiries for prospect of interviews. I aimed to get a coherent sample of case companies from the aforementioned categories complying with Eisenhardt's (1989) instructions on the theoretical selection of cases. Finally, the process led to a desirable coherence. A scope of nine companies from different categories were identified: three crowdsourced grocery delivery platforms, two crowdshipping companies, where the focus was on long-distance deliveries, two local crowdshipping companies, where the focus was on deliveries within a city, one delivery business intermediate exploiting existing delivery businesses and one restaurant delivery service. Exceptionally, the last two were not crowdsourced, by correct definition. Instead, they pooled the deliveries into their vast bases of existing delivery companies and part-time employees, respectively.

This group of case companies represents an ideal sample for theory development. It provides a variety of distinct cases and examples from the industry of crowdsourced goods delivery platforms: One company exploited a large pool of delivery businesses and other a large pool of part-time employees; one platform had experienced a market failure and another received millions in funding; some delivered as delicate items as groceries; one had turned some of the deliverers into employees.

The case companies are presented shortly below. The suffixes of the pseudonyms illustrate the domain each case company was operating in. Grocer refers to grocery deliveries, Shipper refers to crowdshipping, Deliverer refers to local deliveries, and Food refers to restaurant deliveries. Throughout the study I will refer to these groups of case companies, as business models in one domain remind each other. However, I use the term crowdshipping company or crowdshipping platform to refer to BurgundyDeliverer, IndigoDeliverer, BlueShipper and PurpleShipper.

**GreenGrocer.** Founded in 2015, GreenGrocer is a crowdsourced grocery delivery service available in the most populous areas of two cities. The company is focused on same-day and on-demand grocery deliveries and carries out both the picking and delivering of groceries. The company has multiple partner grocers to support its business.

Unlike other grocery delivery platforms, GreenGrocer has employed two of its deliverers. The company has received more than \$500k in funding.

**OrangeGrocer.** OrangeGrocer was founded in 2012 and it had spread into four cities. Similarly to GreenGrocer, the company offers same-day grocery deliveries carried out by crowds who pick and deliver the groceries. The company has partnerships with grocers. The company has received \$100k in funding.

**YellowGrocer.** Founded in 2015, YellowGrocer crowdsources grocery deliveries and is available countrywide for deliverers to join. The locations of registered deliverers determine the available areas for ordering groceries. Unlike OrangeGrocer and GreenGrocer, YellowGrocer has not established partnerships with retailers and allows deliverers to pick and deliver from any store. The company has not received any funding yet.

**BlueShipper.** Launched in 2014, this crowdshipping platform BlueShipper connects those who need anything shipped and those who are capable of doing the task on their route. In addition, the company constantly carries out various pilots and experiments, such as grocery home delivery, with temporary partner retailers. Apart from the pilots, the platform is available countrywide. The company is still funded by seed capital.

**PurpleShipper.** Founded in 2010, PurpleShipper is a crowdshipping platform that connects people that need something shipped with those who can do the task on their way. The platform's deliveries have mainly taken place within one country. The company has not engaged into partnerships with other businesses. The company has received more than \$800k in funding.

**BurgundyDeliverer.** BurgundyDeliverer was established in 2014, and it is a platform connecting people that need something delivered within a city with those who are capable and willing to do the task. At the time of writing the platform had just been launched and has expanded into two cities. The company had not partnerships with other businesses. The company was still funded by seed capital.

**IndigoDeliverer.** IndigoDeliverer was established in 2014 as a part of a large organization until it was ceased a year later. IndigoDeliverer offered its parent

organization's consumer customers to get their parcels delivered home by anyone registered in the system. The service was available in one city.

**AuburnDeliverer.** Founded in 2013, AuburnDeliverer offers its last-mile delivery solution to retailers. In essence, the company sends retailer customers' requests to its large base of partner delivery companies who deliver the product to the end customer. Unlike other case companies, the company does not have its own application. Instead they integrate their API into a retailer's web store so that the end customer may choose their same-day home delivery. The company's services are available in one city. The company has received more than \$500k in funding.

**MaroonFood.** Founded in 2014, the company has been able to expand into major cities of ten countries and receive a generous funding. MaroonFood is a restaurant delivery service that allows customers to order meals that are cooked by the restaurant and delivered by the company's own employees. The company was acquired in 2015 but kept its original brand.

There were nine interviews, in total. Due to the relatively small size and novelty of the companies, one interview was held in each case company and most of the interviewees represented a part of the original founding team. The interviewees were co-founders, CEOs, heads of product and operations and a public relation manager. The interviews were held mainly using Skype and only one individual was interviewed at once except for one interview that was held face-to-face with two interviewees in the same session. The interviews lasted from 40 minutes to 70 minutes. Each session was recorded to enable precise transcribing.

To support the semi-structured interviews an interview guide (see Appendix) was created to outline the themes discussed in the interviews and, later, to confirm some of the discoveries derived from the previous interview in the following session. The interview guide consisted of open-ended question only to outline related themes but it was not followed strictly. Rather the interviews followed discussion's natural flow and the interviewees were encouraged to lengthy conversations with follow-up questions. The interview guide was shaped only to an extent to be able to get a more extensive or precise view on emerged patterns. The interview questions concerned the companies' business models and were aimed to understand the underlying reasons behind models' design.

The archival data that was collected in the previous phase was extended for those in the final sample and used to triangulate and validate the qualitative interview data. The archive data consisted mainly of information on case companies' websites but also media articles that the companies were promoting on their websites. This resulted into total of 27 media articles.

The summary of the case companies and the data collections methods is shown in the table 1.

**Table 1: Data collected from the case companies**

<b>Case company</b>	<b>Founded</b>	<b>Description</b>	<b>Interviews</b>	<b>Media articles</b>	<b>Web sites</b>
<i>OrangeGrocer</i>	2012	Grocery deliveries	1	4	1
<i>GreenGrocer</i>	2015	Grocery deliveries	1 x 2p	6	1
<i>YellowGrocer</i>	2015	Grocery deliveries	1	3	1
<i>BlueShipper</i>	2014	Crowdshipping	1	2	1
<i>PurpleShipper</i>	2010	Crowdshipping	1	2	1
<i>BurgundyDeliverer</i>	2014	Local crowdshipping	1	3	1
<i>IndigoDeliverer</i>	2014	Local crowdshipping	1	3	1
<i>AuburnDeliverer</i>	2013	Delivery business intermediate	1	3	1
<i>MaroonFood</i>	2014	Restaurant deliverer	1	3	1

### **3.4. Data analysis**

The qualitative interview data were analysed in an iterative process following Eisenhardt's (1989) instructions on building theory from case study research. After the interviews were transcribed, I embarked on the within-case analysis which involved detailed examination of the case companies separately and identifying of unique tentative themes. I used the insights derived from the prior literature to limit the analysis to specific issues linked to concepts of crowdsourcing and multi-sided markets. I first categorized the themes into groups defined in the theory section: strategies that related to engaging users and controlling quality. In all the interviews, various pricing strategies were used to engage users. However, strategies to control quality did not only appear to pursue high quality but also aimed at engaging users. Therefore, I developed themes into more specified constructs that emerged from the interviews: pricing strategies, regulating access, regulating interactions and controlling creation. In these constructs, the strategies aimed both at engaging users and controlling quality.

Few case companies aimed at engaging users and controlling quality in other ways, too. In the OrangeGrocer, GreenGrocer and BlueShipper cases, I identified strategies that changed the initial platform design both to engage users and control quality. The interviewees in respective companies mentioned these strategies as crucial for their platform development. This group of patterns was labelled as openness according to the theory section.

After the unique patterns of the cases were identified, I moved to the cross-case analysis, where these themes and relationships were compared across cases. Each case revealed evidences that supported, rejected or shaped the tentative propositions emerged from individual cases. This process led to more generalizable constructs that the case study sample supported and limited. The cross-case analysis revealed that scale affected the case companies. I noticed that the companies used strategies differently depending on the order volumes they had been able to reach. The reasoning behind the strategies choices revealed that companies needed to reach certain thresholds in the amounts of users before being able to adopt some of the emerged strategies. For example, the reason for only two case companies, MaroonFood and GreenGrocer, hiring their deliverers was only because they were able to reach higher volumes than others. Thus, the strategies were not idiosyncratic for these case companies but applicable to all when certain conditions, high

volume, took place. Therefore, I needed to analyse the cases taking into account that their strategies had altered throughout the stages in their life cycles. Accordingly, the Findings section reflects strategies through the life cycle viewpoint.

Further, these constructs were constantly compared with prior literature, too, iterating toward an empirically valid theory that is strongly supported by the data. Some of the emerged themes required me to review and shape the original framework and theory and even the research questions.

In the Findings section, the findings are presented in their corresponding categories: openness, pricing, regulating access, regulating interactions and controlling creation. Some of the emergent concepts were brought up already in the Literature Review section. However, I recognized also new concepts that prior literature on crowdsourcing and MSPs had not identified. I present the identified patterns in the following Findings section.

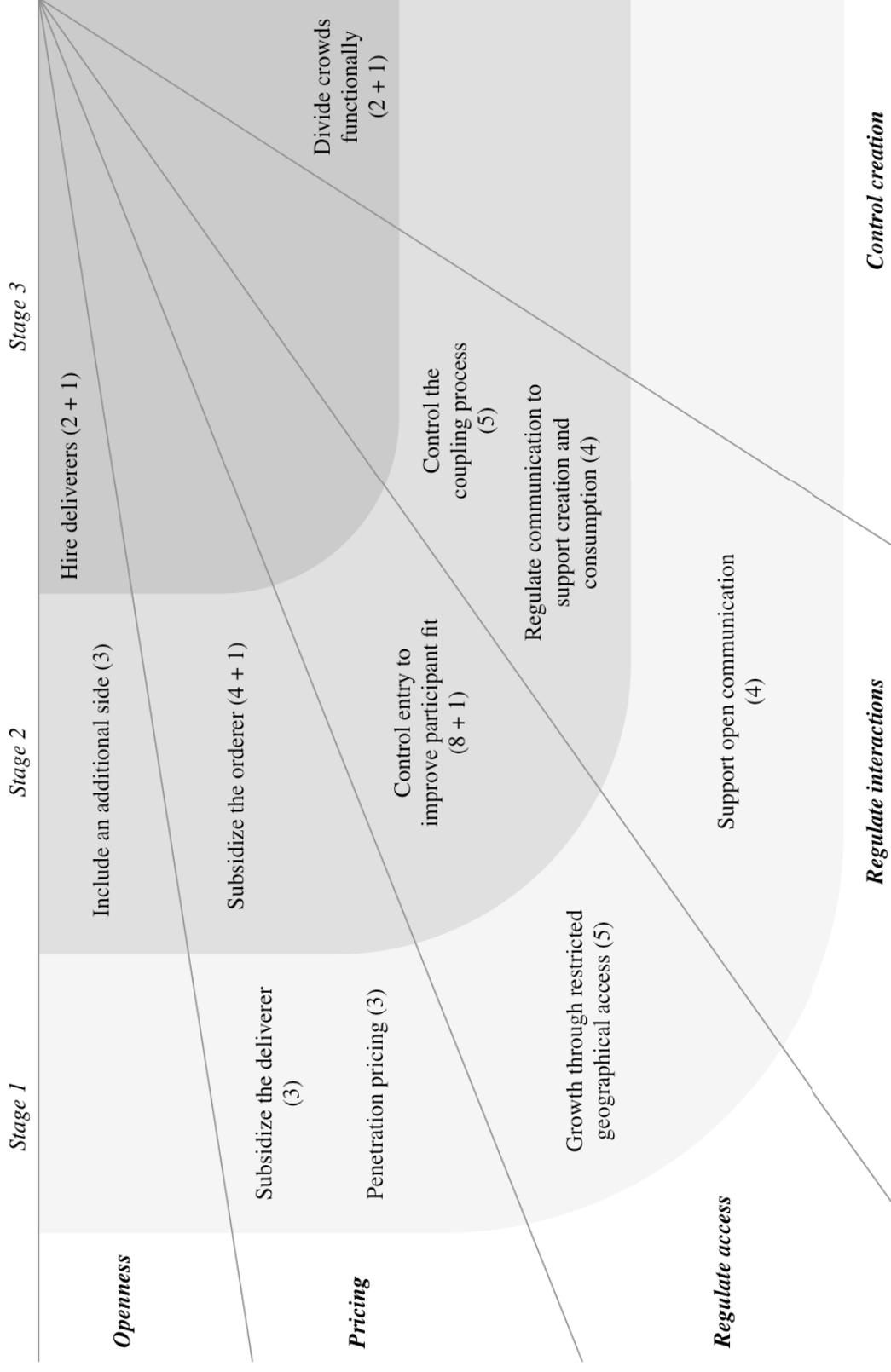
## 4. Findings

This section presents the results of the data analysis. The analysis reveals various openness, pricing and governance strategies that all the case companies used to realize network effects, engage crowds and control quality. The analysis further shows that the different strategies were used in different stages of the case companies' life cycles. Also the nature of delivered products and the business model affected the use of these strategies. For instance, grocery and food delivery platforms need to secure frequency of deliveries because their products are consumed on a daily basis. Long-distance crowdshipping companies, in turn, need to focus on a larger area than locally operating platforms. I elaborate the strategies related to openness, pricing, access and interaction regulation and controlling creation in the following five sections, respectively. I reflect them through the company's business model and discuss their relationships. The results describe the reasoning behind each strategic decision.

**Summary.** The summary of all the strategies used in multi-sided crowdsourced platforms is shown in the Figure 1, below. The figure illustrates the proposed causal relationships of the strategies used in crowdsourcing goods delivery platforms. Stage 1 represents the early stages of the platform life cycle, when volumes of deliveries and the number of users are low. At stage 1, companies' strategies aim at gathering the initial users, the critical mass, and thus grow the platform. At stage 2, the platform has been able to gather sufficient amount of users to realize network effects between them. At stage 3, the platform already grows itself and volumes are high enough to support the strategies presented in the top right corner. At this point, the platform owners seem to weigh the quality of the platform the most and adopt the strategies accordingly. All the strategies at sequential stages are not exclusive, as explained later.

The number in the parentheses shows the amount of the case companies that had adopted the strategy. The number after a plus mark illustrates the additional companies that were intending or planning to use the strategy.

**Figure 1: Strategies used in crowdsourcing goods delivery platforms**



## 4.1. Openness

The platform openness determines the number of the sides that are included onto the platform and how a platform relates to the competing platforms, as discussed in the theory section (Rysman 2009; Eisenmann et al. 2008). The more open the platform is, the more sides, i.e., distinct users groups it hosts. Platforms may increase openness by adding more sides or alternatively decrease openness by reducing the amount of sides and becoming more closed. In addition, offering the same products and services with one of the sides on the platform can be considered as partly closing the side, as the participants of the respective side will find it more difficult to compete once the platform provider offers the substitutes (Eisenmann et al. 2008). Thus, a platform is open when it has multiple sides where users compete only with other users within the same side. In turn, the platform is more closed when it hosts less sides and hampers competition by offering substitutes to the products and services that one of the sides offers.

In this section, I elaborate the openness strategies that the case companies used and their limitations and how they affect to other strategies used in crowdsourcing goods delivery platforms. The case companies both opened their platforms for participation and closed it. As the following case study examples will show, openness has a fundamental effect to strategies related to pricing and governance strategies.

**Include an additional side.** Crowdsourcing goods delivery companies OrangeGrocer, GreenGrocer and MaroonFood were able to make their platform more profitable, pay their crowds, i.e., deliverers, more and charge the orderers less when they were able to include third side, the retailers, onto their platforms. Retailers facilitated also keeping the product listings in the platform application up to date by sharing their data. However, partnerships also made managing the platform more complex.

Before the platforms appeared attractive enough for retailers to join and pay for the participation they needed to reach a certain threshold in the amount of users. OrangeGrocer and GreenGrocer were able to attract retailers only when their markets evolved. In the early phases of their life cycle, the platforms hosted only two sides: the orderers and the deliverers. In less than a year, GreenGrocer was able to gather sufficient amount of users onto their platform to attract retailers. OrangeGrocer, in turn, grew its user base for two years before they were able to establish partnerships with grocers.

Also MaroonFood had the retailer side, restaurants, on its platform. MaroonFood penetrated each new market by establishing partnerships with restaurants before offering deliveries to the orderers. Unlike OrangeGrocer and GreenGrocer, MaroonFood did not need to build up the base of the deliverers prior to launching in new markets, as the company employed them. This case company represents the largest platform in the study sample, in terms of sales and presence in different markets, which readily yields a strong value proposition to attract the retailer side: a potential sales channel.

Partnerships between the platforms and retailers increased the formers' profitability and facilitated maintaining the platform. Firstly, the companies were able to leverage the new side in their pricing strategies. The commissions that the third side paid for each delivery enabled the platforms to offer their orderers lower prices and their deliverers a higher remuneration. Once they managed to conduct the partnerships with grocers, OrangeGrocer and GreenGrocer's revenue streams included commissions that their partner grocers paid for each item purchased through their platforms. The commissions varied between the products. Similarly, restaurants paid commission that was dependent on the meal price for each meal purchased through MaroonFood's platform. I will elaborate these strategies more with other pricing strategies in the following section.

Secondly, the partnerships entailed also shared product information, which facilitated maintaining the platforms. As the orderers were able to browse and purchase the products straight through the platform, GreenGrocer and OrangeGrocer's partners were constantly updating their product data onto the platforms. This ensured that the ordering customers would not purchase items that were out of stock. Similarly, partner restaurants constantly shared their menus with MaroonFood so that the platform would stay up to date.

In turn, also the retailers benefitted from the partnerships. Firstly, a platform with large user base naturally offered retailers a new sales channel. Secondly, GreenGrocer constantly provided the retailers with information on the stores. For example, retailers could improve their store layout based on data concerning the average time the deliverers spent in stores picking up items. Moreover, establishing a partnership with a crowdsourced grocery deliverer allowed grocers to lower the costs in the unprofitable last-mile deliveries. In fact, one of their grocer partners was promoting GreenGrocer's deliveries as a complementary home grocery delivery service for its customers.

*“[The grocers] are losing money with the logistics because they have to offer a system from each store to deliver. Otherwise they have to take the orders like two days before if they want have a working system of logistics. If they want to have a niche store the logistics of the delivery for the online shopping, they are losing money because they need to have some people just for that. They cannot make the offer properly.” –GreenGrocer*

However, partnerships made the case companies’ platforms also more complex. Data sharing with external entities caused some difficulties, as some were more hesitant updating their data than others. The interviewee in OrangeGrocer mentioned this as one of the most challenging quality issues that their platform had faced. Hence, an additional side potentially entails unexpected quality issues and increased complexity on the platform. I go through all the imposed governance strategies later in the Findings.

*“In terms of maintain quality, our biggest hurdle is making sure that the products that they order through our website is available in the store. Because there’s some disconnect between shopper data and in store data that we have in our own web sites. It’s because of the simple fact that some grocers are more hesitant to share data than others.” – OrangeGrocer*

Other case companies in the study did not include an additional side onto their platform mainly due to their business model or the lack in volumes. BlueShipper used retailers in pilots they ran but they were not part of the BlueShipper’s everyday service. AuburnDeliverer already acted as an intermediary between the deliverer and the retailer that represented the orderer for the platform. The crowdshipping companies in turn mainly settled for two sides because their platforms were relying on a model that was solely connecting people that needed something to deliver with those who could carry out the task on their way. Further, IndigoDeliverer and PurpleShipper both mentioned having had difficulties creating volume and frequency of use onto their platforms. Thus, presumably, they failed to reach the threshold of deliveries, which was necessary for attracting the third side, retailers, to exploit these platforms in their business. Similarly, only grocery delivery platform that had not established partnerships with retailers, YellowGrocer, had also had problems with low volumes and particularly providing frequent deliveries in some areas. The case company was still in its early phase of platform development and the amount of users was still low.

**Employing deliverers.** GreenGrocer and MaroonFood integrated to their deliverer side by turning some of the crowds into full-time or part-time employees. Also OrangeGrocer was intending to adopt this strategy. The strategy aimed at maintaining high quality of the service and especially providing more available and reliable service for the orderers. Flexibility, i.e., voluntary choosing of tasks and paying the deliverers on a delivery basis, typically allowed crowdsourcing goods delivery platforms to operate profitably even with low volumes but also resulted in infrequent and unreliable deliveries. Therefore, hiring deliverers required to be supported by a sufficient volume of deliveries, as it traded off flexibility for higher availability.

GreenGrocer aimed at improving availability by hiring some of crowdsourced deliverers as employees. The company had decided to employ some of the deliverers because flexible working hours, which crowdsourcing model provided for the deliverers, had resulted in poor availability of the service. The deliverers were hired to operate full-time in the busiest areas in order to match the supply with the high amount of orders. The crowdsourced deliverers, which chose the deliveries voluntarily, were operating normally and delivered also around the busiest areas. Thus, operating deliveries with own employees in parallel with the crowdsourced deliveries, allowed GreenGrocer to provide more frequent deliveries while keeping the model still flexible.

*“[Hiring deliverers] was more about the availability of the [deliverers] than a little problem. - - Because problem of having this flexible system is that the availability becomes a problem we you’ve made it so flexible” – GreenGrocer*

Similarly, the interviewee in the grocery delivery platform OrangeGrocer mentioned that high volume would eventually make employing some of the deliverers in an area economically the most feasible option. However, the limited volume still required the company to use more flexible approach: to have deliverers as independent contractors.

*“The problem that [the company] has with crowdsourced model is that we don’t have tremendous volume we can engage our contractors in the full-time level in terms of they can rely on [the company] as the primary source of income. - - I think it might be more economical to eventually to go down the model of doing it hybrid or maybe even a full employee level fleet if you have a volume to support it.”–OrangeGrocer*

MaroonFood employed all of its deliverers because their model demanded it. MaroonFood had been able to expand in multiple markets and grow its brand. In each new market, the company fast realized high demand that required high supply. Therefore, the company had to be able to provide sufficient amount of meal deliveries to match the high demand. Hiring deliverers as part-time employees and allocating them around lunch and dinner times was meant to ensure this. Hence, for MaroonFood it was reasonable to trade off flexible, voluntary open call for a reliable service.

Although flexibility yields opportunities for crowdsourced platforms, other companies had not considered possibility of employing deliverers to improve availability. Reason for not integrating to the deliverer side was mainly an insufficient volume of deliveries. Firstly, as mentioned, employing deliverers is economically feasible only if the company has volume to support it. Therefore, due to the nature of crowdshipping companies, BlueShipper, and PurpleShipper could not employ deliverers and stay profitable. The long-distance crowdshipping services provide service to people even in remote locations and between long distances, where providing sufficient volume of deliveries would not be possible.

In addition, employing deliverers is not always an attracting option for the platform provider. When integrating to the deliverer side, crowdsourcing platforms trade off the flexibility, which is the factor that differentiates them from traditional delivery services. Firstly, with the flexible crowdsourcing model, where the crowds are paid only for the deliveries they carry out, the platforms are able to expand the service into a vast market without high upfront cost. Secondly, flexibility also means avoiding risks: the crowdsourcing platforms are able to operate profitable even in uncertain environments that are prone to fluctuations in demand.

*“So our business is literally been able to move to other areas without having to really incur any costs apart from putting a few adverts out for new drivers. Some of our competitors in [the country] which do similar thing but not through crowdsourcing, they’re quite slow to expand. It just shows how expensive it is to expand when you’ve got fleet of drivers to pay and make sure that you give them constant work.” – YellowGrocer*

**Summary.** Crowdsourced goods delivery platforms both opened the platform for new participant groups and closed it. First, they included an additional side to make the

platform more attractive for deliverers and orderers. Retailers became a part of a platform, which entailed commissions for delivering their products. Commissions, in turn, increased the remuneration of the deliverers, i.e., the crowds, or discounted the price for orderers. Thus both were attracted to join the platform in increasing numbers. Second, they hired deliverers for improving quality control, closing the deliverers' side. The strategy aimed at providing the customers, the orderers, with more available and reliable deliveries. Indeed, infrequent deliveries were a major issue for attracting orderers.

However, the platforms needed to reach a sufficient amount of users before adopting these strategies. Before being able to include retailers that were willing to pay commissions, the crowdsourcing goods delivery platforms needed to reach a certain threshold amount of users for them to be valuable enough to attract retailers. Hiring some of the deliverers traded off flexibility that allowed platforms to be profitable even with low volumes. Hence, this strategy needed also to be supported by a sufficient volume of deliveries in an area for these platforms to stay profitable.

A brief summary of the openness strategies that crowdsourcing goods delivery platforms used is shown in the Table 2.

**Table 2: Strategies the case companies used to alter platform openness**

Case company	Sides on the platform	Openness strategies
<i>OrangeGrocer</i>	Orderers - Deliverers - Grocers	<ul style="list-style-type: none"> <li>• Include a retailer onto the platform</li> <li>• (Intention to employ some of the deliverers)</li> </ul>
<i>GreenGrocer</i>	Orderers - Deliverers - Grocers	<ul style="list-style-type: none"> <li>• Include a retailer onto the platform</li> <li>• Employed some of the deliverers</li> </ul>
<i>YellowGrocer</i>	Orderers - Deliverers	<ul style="list-style-type: none"> <li>• Had not altered openness</li> </ul>
<i>BlueShipper</i>	Orderers - Deliverers	<ul style="list-style-type: none"> <li>• Retailers were included in some pilots the platform ran</li> </ul>
<i>PurpleShipper</i>	Orderers - Deliverers	<ul style="list-style-type: none"> <li>• Had not altered openness</li> </ul>
<i>BurgundyDeliverer</i>	Orderers - Deliverers	<ul style="list-style-type: none"> <li>• Had not altered openness</li> </ul>
<i>IndigoDeliverer</i>	Orderers - Deliverers	<ul style="list-style-type: none"> <li>• Had not altered openness</li> </ul>
<i>AuburnDeliverer</i>	Retailers - Deliverers	<ul style="list-style-type: none"> <li>• Had not altered openness</li> </ul>
<i>MaroonFood</i>	Orderers - Restaurants	<ul style="list-style-type: none"> <li>• Employed all the deliverers as part-time employees</li> <li>•</li> </ul>

## 4.2. Pricing strategies

The pricing strategies aim at realizing network effects and engaging users. They address pricing challenges that involve balancing prices in a viable way for all the users groups (Hagiu 2014), and also leveraging individuals' intrinsic motivations (Boudreau & Hagiu 2008).

In this section, I first further elaborate the penetration pricing strategy that the crowdshipping companies used to obtain the initial user base, the critical mass. Then I describe how the rest of the case companies, which determined the prices themselves, moved from subsidizing deliverers to subsidizing orderers.

**Penetration pricing to attract the critical mass.** The crowdshipping companies aimed at attracting the initial mass of users by offering their service without any transaction fees.

The early stages of the platform life cycle are challenging for platforms because no side will join while the other one is missing. Therefore, the companies maintained the value as high as possible for the users by postponing the monetization. The companies did not monetize the platform until the number of users had reached a threshold after which the opposite sides would have continued attracting one another and the platform would have kept on growing by itself.

In this study, I use the term critical mass to refer to a threshold amount of users that entailed viability. In a viable platform, the opposite user sides would attract each other making the platform grow by itself. Viability was achieved when the amount of deliverers matched the order demand. Thus, the critical mass was not an exact number of users but a varying transition point where platform became viable.

*“For a company to be viable, you have to hit that certain sweet spot for your company to make sure that you’re profitable in each city.” – OrangeGrocer*

*“- [The platform] feeds itself. So it grows year and year without us doing anything, really, which is what we’re looking for.” – PurpleShipper*

*“As soon as you’ve got a critical mass of orders in a particular area we’re not having to [encourage] [deliverers] to scale up and do the delivery.” – YellowGrocer*

*“First of all you need to get there enough [deliverers] to cover the population of that city- -“ – GreenGrocer*

The crowdshipping platforms, BlueShipper, PurpleShipper, BurgundyDeliverer and IndigoDeliverer, could not subsidize a single side because they did not determine the prices themselves. All the crowdshipping platforms had incorporated an open pricing system where the users determined the delivery prices themselves. The balance of supply and demand would define the prices, instead: if supply, i.e., the amount of the deliverers, is high and demand, i.e., amount of orderers, is low, even low priced orders are likely to get delivered soon and vice versa. Thus, the platforms could hardly influence in prices.

Therefore, the crowdshipping companies, which deployed open-pricing system, needed to attract the necessary initial mass of users with penetration pricing, i.e., by maintaining the platform free from transaction fee. In the early phases of their life cycles, the

crowdshipping companies attracted both deliverers and orderers onto their platforms by offering the service without a transaction fee. Thus, the platforms did not gain any profit in exchange for the critical mass, which was crucial in increasing the amount connections between users. If the platforms were able to gather the initial user base and realize beneficial connections between them, the following positive network effects would result in self-feeding platform where increase in amount of users on one side would attract the users on the other. However, only IndigoDeliverer from crowdshipping companies had introduced a transaction fee.

The other crowdshipping companies intended to monetize the platform once a sufficient user base had been grown and the service had become a functioning, reliable platform. As discussed before, the larger the platform the higher the value is for its users. Thus, the case companies were to monetize their platforms once the value for users had grown high enough for sharing. BurgundyDeliverer and BlueShipper were planning to introduce a simple transaction fee of 5 % to 10 %. PurpleShipper, in turn, had various prospect monetizing strategies, such as transaction fee, premium insurance and subscriptions.

*“We don’t take any commission, we don’t charge anything. And we will most probably follow this model for a while until we grow our user base and we do all the necessary small changes and optimizations.”—BurgundyDeliverer*

*“We will turn on the monetization within couple of weeks, I would say. - - We have a bunch of different ways of monetizing and we will turn on in different stage the different ones. - - There’s a just a percentage fee from sender, it could be a combined sender fee and bringer fee, it could be post-subscriptions for professional companies to give them value-added services. It could be premium insurance - - Then express notification” – PurpleShipper*

From the crowdshipping companies, IndigoDeliverer was the only one to charge a transaction fee from the beginning. The fee was used to cover the admin and maintenance costs. Being a spin-off of a larger logistics organization, IndigoDeliverer differed fundamentally from the rest of the companies that mainly were self-funded start-ups but it did not presumably result to any requirement for a higher return on investment than in the other case companies. According to the interviewee, IndigoDeliverer failed to realize enough volume for it to be interesting for the parent organization and was eventually

ceased. However, the relatively low transaction fee was not suspected to be the cause for the network failure.

*"We had a small commission, I can't recall how big it was, to cover the admin and the maintenance of the platform. - - Our commission was really low from the beginning. It was not in the level to change anyone's decision. - - The price was set by the end receiver. And if it was zero price for him, there was no commission either. I don't [believe] that it would be a deciding factor." – IndigoDeliverer*

YellowGrocer did not use penetration pricing when entering new markets but adopted a similar approach for the least profitable deliveries. The pricing mechanism in YellowGrocer was designed in a way that the platform did not turn a profit in the least profitable deliveries ensuring a sufficient pay for the deliverer. The delivery fee charged from the orderer was not dependent on the distance, contrary to the deliverer's pay. Consequently, in low volume, i.e., low profitability areas the platform would not receive any profit making the delivery more valuable for both the orderer and the deliverer. In turn, in high volume, i.e., profitable areas, where the distances are short and deliverers are able to deliver more at once, there is enough value for the platform to charge a profit.

*"The drivers [are] paid the fixed amount per delivery - - then we may have to take any hits in price differences depending if the products are more expensive. Other things that can affect our profit margin would be the distance actually paid. So we pay the driver [extra] for going further distances. Again that may just knock us under profitability on some of the smaller orders and voucher codes. " YellowGrocer*

The case companies that determined the prices themselves did not need to use penetration pricing. OrangeGrocer and GreenGrocer's pricing algorithms were established in a way that there was a share allocated for the company, too. Naturally, they could have used penetration pricing by not taking the share. But these case companies were growing the platforms by subsidizing a single side, the deliverers. They covered the cost of subsidizing by charging the orderer more or by demanding commission from the retailers.

**Subsidizing the deliverers.** In the early stages of their life cycle, GreenGrocer, OrangeGrocer, YellowGrocer subsidized the deliverer side that needed to be attracted first onto the platform for the orderers to join. Deliverers represented this critical mass for these case companies, as they were needed to provide the service in the first place. More

deliverers also resulted in more frequent deliveries on the platforms. To cover the cost of subsidizing, these case companies charged the profit from the orderer, instead.

Ensuring sufficient pay for the deliverer or even subsidizing them was necessary in order to engage them already from the early stages of a platform life cycle. For the platforms, the deliverers represented the critical mass, which was needed to provide sufficient amount of deliveries for the ordering customer. If the platform had too few deliverers, the deliveries would have been too infrequent to keep the orderers content with the service. Therefore, deliverers were needed to provide a reliable and available service, which aimed at attracting orderers to use the service.

For example, GreenGrocer was constantly ensuring that the platform had enough deliverers to satisfy the orderers. The company let people to register as deliverers, but not deliver, in the areas they were planning to expand, beforehand. Each time prior to launching the service in a new area, or a zip code, they first estimated the amount of prospect orderers in the new area. Then the company ensured that they had enough pre-subscribed deliverers there to provide the orderers with reliable delivery service. The company executives saw this critical for a functioning platform.

GreenGrocer: *“First of all, you need to get there enough [deliverers] to cover the population of that city - - We see how many [deliverers] do we need. So we focus the first week on getting those [deliverers]. Since we have the [deliverers] and we also have the retailer, we just make a little marketing there and then we open”*

In turn, low amount of deliverers led to a poor availability of the service. YellowGrocer used a different approach to launch a service; a zip code was opened when a person signed up to deliver in the area. Thus, the platform was not able to provide a reliable service just after the launch, as the amount of deliverers did not reach the required critical mass.

YellowGrocer: *“- - as soon as one driver then signs up, customer with that post code would be offered a delivery service. So it's just one driver, it's probably not enough to offer a reliable deliver service.”*

To obtain the initial, required amount of deliverers the prices were constructed to subsidize and thus attract them. The crowdsourcing goods delivery platforms pricing

algorithms were aimed at securing sufficient pay for the crowds, i.e., the deliverers, for their contribution. The platforms that displayed products on their service, OrangeGrocer, GreenGrocer, YellowGrocer and MaroonFood, were able to charge the end customer mark-ups on the products or a delivery fee, or both. Mark-up was a fixed percentage or a varying margin based on external factors, such as time and distance, which reflected the crowds' time spent on deliveries. The delivery fee was also based on factors that worked as proxies for the deliverer's time spent. For example, in grocery delivery platforms, where the deliverer had to collect the items from the grocers' shelves themselves, the total amount of items in an order is the main proxy for the delivery fee that is charged from the customer (only OrangeGrocer and GreenGrocer) and paid to the deliverer. Similarly, AuburnDeliverer's delivery fee was dependent on the area of the delivery, as in some areas delivering is more difficult and time consuming than in others.

The orderers could be charged relatively more in the early stages of the platform's life cycle to cover the cost of subsidizing of deliverers. For example, YellowGrocer was aiming to obtain the critical mass of deliverers by strongly subsidizing the deliverers while charging the orderers more. The platform integrated a mark-up that they expected to affect negatively to the number of orderers but which enabled them to pay higher remuneration per delivery. The higher remuneration in turn encouraged delivering and signing up as a deliverer. The mark-up and the deliverer remuneration were planned to be lowered once the critical mass was obtained and the amount of deliveries had scaled up.

*“So we offer a big mark up. We also pay the [deliverers] more with our particular model. So I think that probably affect the number of people that order from our service. - - We want to bring prices down for the customers and also pay down for the [deliverers] as well. As soon as you've got a critical mass of orders in a particular area we're not having to [encourage] [deliverers] to scale up and do the delivery. - - Every time we've spoken to the [deliverers] they are really happy with the amount they are earning. - - That's sort of how we've had to solve one of the problems and we've done that by [encouraging] [deliverers] by paying them a fair amount of money.”*

In addition to subsidizing deliverers by manipulating prices on the platform, the case companies were also investing and aiming their efforts to support the delivery activities. This may also be considered as subsidizing, as discussed in the Literature Review. OrangeGrocer automatically combined nearby orders together on their platform to

support delivering multiple orders at once, which guaranteed higher pay for deliverers – and higher profit for the company. GreenGrocer, YellowGrocer and MaroonFood sent the orders always first to the nearest deliverers to encourage only the most profitable deliveries (in GreenGrocer distributed the deliveries based on other metrics than proximity, as well). In PurpleShipper and BurgundyDeliverer's platforms deliverers were first asked their destinations and then they were suggested orders that were located by the route and could be delivered without excess effort. PurpleShipper was also following, when allowed, platform users' daily driving habits and suggesting the most suitable orders that corresponded to their routes.

BlueShipper further engaged its deliverers with a game. In one of their pilots, BlueShipper organized a motivating game that the deliverers could participate in and that was linked to the platform's delivering activities. Rather than aiming towards more efficient deliveries, BlueShipper's approach rewards and further engages the users with non-pecuniary incentives, such as recognition, skill development and sheer fun. Instead of increasing the remuneration for the deliverers, BlueShipper tapped into the crowds intrinsic motivations to engage them.

*“The deliverers that took part to the game said that they would not require lot of money just for playing a game.” – BlueShipper*

The efforts to support the delivery activities further prove that the crowdsourcing goods delivery services were subsidizing the deliverer side to realize network effects in the beginning. In effect, the side does not only represent the critical mass but is also a close equivalent for a staff which creates the value in the end – which also denotes that the investments are expected to eventually have returns.

**Switch to subsidize the orderer.** Once the amount of deliverers matched the order demand, GreenGrocer, AuburnDeliverer and OrangeGrocer started to subsidize and thus attract the customers, i.e., the orderers, in increasing numbers to further grow the platform. To cover the costs in subsidizing of the orderers, the platforms lowered the deliverers' remuneration or conducted partnerships with retailers that paid a commission for each delivery.

YellowGrocer, too, was intending to switch to subsidizing the orderer side by lowering the deliverer remuneration once they had obtained the critical mass of deliverers.

YellowGrocer, established in 2015, was still in the nascent phase and thus still subsidizing the deliverer side. However, the company was planning to turn this pricing strategy upside down. Once there are enough deliverers on the platform to provide frequent deliveries, they do not have to be attracted anymore with compelling remunerations. A high number of deliverers might result in excess competition on the side, which would lead into fewer orders per deliverer and in fact make the platform less attractive for them. Therefore, the deliverer remuneration can be brought down to further increase value for the orderer, in turn.

*“We want to bring prices down for the customers and also pay down for the [deliverers] as well. As soon as you’ve got a critical mass of orders in a particular area we’re not having to [encourage] [deliverers] to scale up and do the delivery.” – YellowGrocer*

AuburnDeliverer had reached the threshold amount of deliverers, which allowed it to lower deliverers’ remuneration in order to subsidize orderers, instead. The platform had been able to grow its deliverer base up to approximately 200 delivery companies. Such quantity on the deliverer side had allowed AuburnDeliverer to subsidize the opposite side, the orderers, and offer them deliveries priced lower the general average level in the area. Apart from the aforementioned reasons, AuburnDeliverer was able to provide lower than normal industry level prices also because it represented supplementary income for the deliverers. AuburnDeliverer’s deliverers consisted of existing delivery companies and they were not obliged to deliver an order in the platform. However, when idle, they could cover some of the sunk, fixed costs related to running a business by delivering these additional orders. Thus, AuburnDeliverer was able to tap into unused resources of regular delivery companies.

GreenGrocer and OrangeGrocer covered the cost of subsidizing the orderer by including retailers onto the platform, instead. The partnerships entailed more profitable deliveries due to commissions and lower costs. The partner grocers paid commission per item delivered, which allowed GreenGrocer to display the same prices as in stores, in general. GreenGrocer was also able to move some of the advertising costs to the grocers that were willing to endorse their service as one way to get the groceries delivered home. The partnerships, thus, allowed the platform to lower the delivery fee for the orderer while maintaining sufficient pay for the deliverer.

However, only the successful platforms, in terms of growth, were able to attract other external entities. After opening their service more than in one city and succeeding in creating some traffic onto their platforms, OrangeGrocer and GreenGrocer both included an additional side on their platforms: grocers. (OrangeGrocer had partnerships with grocers but was reluctant to provide further details of the partnership).

Similarly, MaroonFood's brand and presence in multiple markets facilitated them conducting partnerships with the restaurants. Each time prior to moving to a new market, MaroonFood established partnerships with restaurants. Due to the commissions that restaurants paid for each delivery, MaroonFood was able to provide consumers with low priced deliveries, which had been crucial in the industry. Contrary to OrangeGrocer and GreenGrocer, MaroonFood was able to negotiate partnerships with retailer without any position in the target market because they had already been able to grow and scale to various markets, which showed potential for future sales channel and thus readily attracted restaurants. MaroonFood's case supports the finding that platforms are able to attract the retailers to the platform as a money-side when their value has increased with scale.

Similarly, GreenGrocer's benefits increased after each new partner grocer. GreenGrocer's first large partner grocer was followed by more and more grocers interested in joining the platform, which resulted in increase in the value of the platform. This allowed the company to negotiate increasingly higher commissions, which in turn increased value for the orderers and deliverers. Retrospectively, GreenGrocer was able to leverage a participant that yielded a significant value for the platform and consequently attracted others to join, too. In GreenGrocer case, incorporation of the high-value participant resulted in higher commissions, which in turn led to lower cost for the new subsidy side, the orderers.

GreenGrocer: *"I think the main thing to make it profitable is to partnership with these retailers - -Also there are other retailers that want to be inside so they paid more. So it's just the wheel that we are becoming more and more famous so they are just paying you more and increasing the commission - -"*

Surprisingly, none of the crowdshipping platforms exploited retailers or businesses as a separate entity. There were businesses that requested deliveries but BurgundyDeliverer

considered them as normal orderers. PurpleShipper had business users that were able to offer crowdsourcing deliveries through PurpleShipper but did not pay any commission for them. BlueShipper exploited occasionally retailers in pilots, as discussed before, but they were not involved in the platform's basic functionality on a daily basis.

**Summary.** The crowdsourcing goods delivery platforms adopted different pricing strategies depending on their business model. The crowdshipping companies relied on an open pricing system, where the users determine the delivery prices themselves. Thus, the platform providers are not able to subsidize a single side, as they do not determine the prices themselves. They had to rely on penetration pricing, i.e. postponing monetization of the service, to attract users in the early stages of the platform life cycle. In turn, the other crowdsourcing goods delivery platforms that defined the prices themselves were able to subsidize a single side. Thus, they were able to correct imbalances on the platform by attracting one side more than the other.

Subsidizing consists of at least two sequential stages that the crowdsourcing goods delivery platforms follow. First, in the early phases of the platform growth, the platforms subsidized deliverers who were needed to provide a functioning delivery service in the first place. The voluntary choice of tasks in crowdsourcing platforms typically demands for high number of deliverers before the platforms are able to provide the orderers with frequent deliveries, i.e., an available delivery service. In the second stage, when number of deliverers had enabled frequent deliveries, the crowdsourcing delivery platforms started to subsidize the orderers to attract them in increasing numbers and further grow the platform. The cost of subsidizing was covered either by lowering the remuneration of the previous subsidy-side, the deliverer, or by including retailers as a new side, if the platform had grown enough to attract them.

The companies did not solely rely on pricing strategies but also used rewarding mechanisms and invested in the deliverer side to support more efficient value creation process and engage the users.

A brief summary of the pricing strategies that were used to realize network effects, engage crowds and control quality is shown in the Table 3.

**Table 3: Pricing strategies used by the case companies**

<b>Case company</b>	<b>Pricing strategies</b>
<i>OrangeGrocer</i>	<ul style="list-style-type: none"><li>• Subsidizes deliverers to gain critical mass</li><li>• Starts subsidizing also the orderer by including a retailer</li></ul>
<i>GreenGrocer</i>	<ul style="list-style-type: none"><li>• Subsidizes deliverers to gain critical mass</li><li>• Starts subsidizing also the orderer by including a retailer</li></ul>
<i>YellowGrocer</i>	<ul style="list-style-type: none"><li>• Subsidize deliverers to gain critical mass</li><li>• (Planning to switch subsidizing orderer and lower deliverer remuneration once critical mass had been obtained)</li></ul>
<i>BlueShipper</i>	<ul style="list-style-type: none"><li>• Penetration pricing: No monetary benefits the company in the nascent phase in order to attract users</li></ul>
<i>PurpleShipper</i>	<ul style="list-style-type: none"><li>• Penetration pricing: No monetary benefits for the company in the nascent phase in order to attract users</li></ul>
<i>BurgundyDeliverer</i>	<ul style="list-style-type: none"><li>• Penetration pricing: No monetary benefits the company in the nascent phase in order to attract users</li></ul>
<i>IndigoDeliverer</i>	<ul style="list-style-type: none"><li>• Low transaction fee from the beginning</li></ul>
<i>AuburnDeliverer</i>	<ul style="list-style-type: none"><li>• Subsidizes orderers by lowering deliverer remuneration sufficient mass had been obtained</li></ul>
<i>MaroonFood</i>	<ul style="list-style-type: none"><li>• Subsidizes orderers and deliverers by charging the retailer side</li></ul>

### **4.3. Regulating access**

Regulating access was one of the governance strategies that were used to control the quality on the platform and ensure positive network effects and engagement of the users. Contrary to the openness strategies, regulating access addressed only the access of single individuals of each user group. Thus, access regulation does not control the number of sides.

In this section, I describe how and why the crowdsourcing goods delivery companies regulated access of their crowds. The case companies limited geographical access and sorted out the desirable prospect participants from the undesirable ones.

**Growth through restricted geographical access.** Crowdsourcing delivery platforms managed their growing by establishing their service in one limited area before moving to the next. Restricted geographical access facilitated controlling quality and increased the likelihood of relevant connections, due to the users' proximity. This led to increasing amount of relevant connections and positive network effects.

The case companies deployed varying levels of geographic restriction. OrangeGrocer, GreenGrocer, BurgundyDeliverer, IndigoDeliverer, AuburnDeliverer and MaroonFood all restricted access in a city or a zip code level mainly to realize network effects in a limited area before scaling up. YellowGrocer, in turn, restricted access in a country level. BlueShipper, PurpleShipper targeted the service to users that travel abroad and between cities, which required them to tap into a large pool of prospect orderers and deliverers. The interviewees said that the growth through restricted access was necessary to realize a viable platform.

*“For a company to be viable, you have to hit that certain sweet spot for your company to make sure that you're profitable in each city. And also many of these on-demand services start with a very niche area of a city and then expand slowly by slowly. So that's regarding the geographic.” – OrangeGrocer*

Growth through restricted access facilitated establishing relevant connections between the users, providing frequent deliveries and controlling quality. Firstly, the strategy helped the case companies to speed up the increase in the number of relevant connections between the deliverers and the orderers, which naturally contributes to platform growth. In physical goods deliveries an exchange of goods takes place, which requires the deliverer to meet with the orderer. Therefore, the number of relevant connections increases when the users on the opposite sides of the platform are located near to each other. Hence, the platform does not need a large amount of users in order to be viable in a limited area.

*“- - When you don't have that much supply or that much demand, it's very difficult for the company to do the correct [matching of users]. - - So all platforms, all market places, anything that's crowdsourced, crowdshipped or crowdfunded or whatever needs both sides to have a good balance to work well. And for example, in our case, in the case of deliveries - - you have to follow a hyper-localized model. Because people want something*

*delivered within a city or need to get some transportation within a city, you have to focus on each city one by one. - - We have to again start building the whole thing, building the demand and supply and do the [matching of users].” – BurgundyDeliverer*

On the contrary, in long distance deliveries, it is more difficult to establish relevant connections. The aim of the BlueShipper and PurpleShipper is to find people who could deliverer goods from orderers’ location to the drop-off location on their way. The prices on the platform are not high enough to encourage deliverers to do the task without having to do the trip anyways. The likelihood of relevant connections is thus much smaller. It is unlikely for any deliverers’ long-distance route to match the orderer’s location and the drop-off location. Indeed the frequency of use had been a major challenge for crowdshipping companies BlueShipper and PurpleShipper that supported the long-distance deliveries and needed to offer their service countrywide.

However, to solve this problem, also crowdshipping companies may adopt geographically restricted growth. The interviewee in PurpleShipper suggested that targeting the service in the busiest routes between the most inhabited cities could have an influence on the rate of the deliveries. This adaptation of geographically restricted growth would have increased the probability of relevant connections, similarly to city-by-city approach. Relevant connections, in turn, would have facilitated increased the frequency of use and thus growing the platform.

*”[As an answer to a question about the expansion strategy:] Usually we do it on a market by market, country by country. So a lot of other companies - - do city by city. - - But we see that doing just that although it might be smart, it kind of limits our market, because there’s so many people that needs to send something between cities or longer distances and there are also lot of people traveling in those areas. But of course it might have been smart to focus on different routes, say for example, [one large city] to [another large city].” – PurpleShipper*

Secondly, growing through restricted access helped the crowdsourcing goods delivery platforms also to offer more frequent deliveries. Limiting ordering only to certain areas facilitated gathering the critical mass of deliverers, which would guarantee available service. For example, grocery delivery platform GreenGrocer ensured that they had enough pre-signed-up deliverers in a zip code to cover the estimated amount of prospect

orderers in the area prior to launching the service there. Similarly, interviewee in AuburnDeliverer mentioned that they could not expand their service into other cities before they had gathered a sufficient amount of deliverers into that area. An available and reliable service was necessary in order to be able to provide enough value for the orderers on to the platform. Indeed, BurgundyDeliverer had found the orderers being demanding concerning the reliability of the service.

*“[Comparing the orderers to the deliverers:] - - the [orderer] has more demands, needs the service more urgently and will not excuse us many mistakes if you do any.”– BurgundyDeliverer*

In YellowGrocer’s platform the deliverers’ locations determined where the service was available. YellowGrocer was available for deliverers to join within the country, and once a user signed up as a deliverer, the service would be offered for the orderers in the respective area or zip code. With this approach the platform was able to expand geographically quickly and with low cost and tap into a large crowd of potential deliverers. However, they were not able to provide a reliable service everywhere, in terms of availability, due to the lack of deliverers. For example, if there were only one deliverer in the area, the service would still be offered to the ordering customers resulting in a potentially unreliable service.

*“I think the advantage is that we’ve built to expand quite quickly across the whole country. So our business is literally been able to move to other areas without having to really incur any costs apart from putting a few adverts out for new drivers. - - As soon as one driver then signs up, customer with that postcode would be offered a delivery service. So it’s just one driver, it’s probably not enough to offer a reliable deliver service. - - If a customer orders in one small area but we don’t have any deliver drivers then you get quite disappointed customer.”– YellowGrocer*

Lastly, growth through restricted access was necessary for controlling the delivery distance which quality was highly dependent of. Grocery and food delivery platforms, OrangeGrocer, GreenGrocer and MaroonFood needed to strictly control the distances between a store or a restaurant and the orderer due to the perishable nature of food. Therefore, these platforms permitted only orders in the same zip code where the restaurant or the grocer was located.

*“We plan the delivery areas so that our deliverers would spend more than 15 minutes driving to from restaurant to the orderer.” –MaroonFood*

However, regulating geographical access cannot be concluded to be a decisive factor for growth. First, tapping into an existing, high-volume product segment, such as groceries or restaurant food, which people consume on a daily basis, is expected to have an effect on the frequency of deliveries and thus growth. In crowdshipping platforms, the users’ need for a delivery was much more infrequent. This resulted in problems with frequency and long tail of idle users.

*“[As an answer to obstacles in crowdsourcing:] --Then of course, the frequency use case. It’s an obstacle because when you start a service like that, unless you get into for example directly in food delivery where frequency is abundant. - - And how often you have a delivery need? Most people don’t need delivery need every week. You have it three times a year, maybe. And then it doesn’t really become much.” – PurpleShipper*

Second, any service fails if it cannot deliver enough value for the end customers. After failing to realize sufficient volume on the platform, local goods delivery platform IndigoDeliverer decided to cease their service, although being restricted to a relatively populous city. The interviewee of IndigoDeliverer claimed, however, that the concept failed to create enough value for the target customer and the deliverer: the service allowed the orderer to get his package delivered from a *nearby* (maximum one kilometre according to the interviewee) delivery point, where online orders were shipped, by anyone subscribed as a deliverer. Thus, the deliveries were, presumably, infrequent due to the nature of the service – the value, in brief, was to get infrequent online orders delivered from a nearby location.

*”I think the core problem is that the [platform] solution did not offer enough value for the end receiver. - - We put lot of effort into extracting [deliverers] with reasonable success I would say. But in the end there were very few parcels that were posted on the [platform] app for the delivery.” – IndigoDeliverer*

**Control entry to improve fit of the participants.** The crowdsourcing delivery platforms increased the likelihood of relevant connections and decreased the likelihood of negative ones by controlling the participant entry process. Confirming deliverers’ identities, organizing training and orientation and limiting deliverers only to existing delivery firms

or own employees were practices used to control deliverer access to secure a high quality of the delivery service. After the vetting and training process, the rating system ensured that the deliverers were held under a constant surveillance. A different control was applied to retailer side: the case companies involving the retailer side simply had guidelines for selecting partners that were of benefit for their business. Apart from the geographical restrictions, the orderer access was regulated only with social filters.

The main mechanisms to control the deliverer access were the background checks, the social filters and the bank verification. BurgundyDeliverer and OrangeGrocer vetted deliverers with thorough background checks and BlueShipper required users to register through bank verification. PurpleShipper, GreenGrocer and BurgundyDeliverer verified identity with social filters, such as Facebook account, and other information, such as credit card information also to ensure that the platform users involved only real people. Registering in IndigoDeliverer and YellowGrocer did not involve any vetting process. AuburnDeliverer chose only existing delivery companies to make deals with and MaroonFood's access regulation could be considered the strictest as it only used its own employees.

These mechanisms were less strict in the crowdsourcing goods delivery platforms that still had a low volume of deliveries. Entry regulation was perceived unbeneficial for the platform especially in the early phase of the life cycle when growth in users is crucial, as restricting access potentially hinders the increase in amount of users. Further, when volumes are low, quality issues occur less likely, so entry regulation was perceived unnecessary in the beginning. Thus, the reason for loose regulation in the user entry in nascent platforms can be interpreted to be a goal to support fast growth.

*“So usually when the platform is small, it reduces the friction to gain more traction. And as it scales, it brings more friction.” – BurgundyDeliverer*

*“[As an answer to the question about potential quality issues:] That was not a concern. We never realized that in reality. I think we didn't get enough volume to understand what quality issues we had or to realize. Like the real quality, operational quality issues. If you take quality for operational quality, we did not get enough volume to catch that.” – IndigoDeliverer*

In three of the case companies, OrangeGrocer, GreenGrocer and MaroonFood, the vetting process was followed by deliverer training, which further ensured the fit of the participants. This phase is presumably challenging to carry out efficiently, if the number of applicants is high or amount of deliverers needs to be increased quickly. However, grocery delivery platforms OrangeGrocer and GreenGrocer deemed this phase crucial for maintaining the quality of the grocery deliveries. OrangeGrocer required first delivery applicants to pass an online training and, after, gave them guidelines for shopping, picking up items and communicating with the orderer. Similarly, GreenGrocer provided their deliverers with training and guidelines for shopping and delivering.

*“ - You’re dealing with people’s groceries and this is what people consume on a regular basis. So, yes, they’re [going to] be very careful about where they order from. So we have one chance. And if they are trusting a new brand they have never seen before they might be hesitant. So it starts from recruiting. We tell our [deliverers] to shop as if you were shopping for your own family. We create them guideline on how to shop certain fruits and vegetables and so forth, how to proceed in terms of making sure that a product is out of stock, how do communicate with the customer and stuff like that.” – OrangeGrocer*

Perhaps the most popular regulation mechanism for crowdsourcing platforms was a rating system, which was maintained by the participants. Although the system did not weed out the undesirable participants prior to access, it prevented negative interactions from recurring. GreenGrocer, PurpleShipper, BurgundyDeliverer and IndigoDeliverer allowed orderers to rate and evaluate the deliverer, and YellowGrocer was intending to introduce this feature. OrangeGrocer did not deploy rating system but instead encouraged users to give feedback on their operations and their deliverers. In addition, GreenGrocer and IndigoDeliverer enabled the rating and evaluation another way round, too. In GreenGrocer, the ratings on orderers were not public.

The rating systems were used for the same purpose, albeit differently. In PurpleShipper, BurgundyDeliverer and IndigoDeliverer the orderer could choose the deliverer based on the ratings among other factors. In GreenGrocer, the rating was one of the factors that affected the automatic distribution of tasks to deliverers. Furthermore, GreenGrocer contacted the deliverers who had been rated poorly and were not following the platform guidelines. Although not using a rating system at the time, YellowGrocer monitored quality by following the user feedback and similarly expelling the deliverers that violated

the rules of the platform. Nevertheless, the goal was the same: limiting deliveries of the deliverers who had performed poorly and preferring those whose behaviour was exemplary.

BlueShipper, AuburnDeliverer and MaroonFood did not have a rating system for their deliverers. Naturally, as an employer, MaroonFood could not exploit ratings to limit its employees from working. AuburnDeliverer, in turn, was acting as an intermediary and the end customer did not have an access to the platform. Thus, the rating system was not applicable.

The platforms that involved the retailer side did not have extra measures for controlling the retailers' access because the volume on the side was relatively small compared to the orderer and deliverer side. Instead, companies established partnerships with companies that were interested in joining the platform and were suitable in terms of the service's focus and requirements. MaroonFood established partnerships only with restaurants that suited its offering – e.g., by keeping the pizzerias out. OrangeGrocer and GreenGrocer were in the phase of proceeding slowly with partnerships and each deal was separately negotiated with different terms with each grocer. AuburnDeliverer was limiting retailers only into the area where they had sufficient amount of deliverers in order for the service to be liable.

Orderers' access, in turn, was merely restricted. Platforms limited the access with social filters but mainly the customer access was maintained loose, apart from the geographical restrictions. For example, BurgundyDeliverer let users to join only with their Facebook accounts in order to ensure that the people behind the accounts were real.

**Summary.** The case companies regulated access in two different ways: restricting geographical access and imposing vetting and training processes for the prospect deliverers. The former strategy was adopted to create a viable platform in one market prior to moving to another. Limited area increased the likelihood of relevant connections between the users due to their proximity, which made restricting geographical access beneficial. The latter was used simply to weed out the undesirable deliverers and improve the fit of the rest in order to maintain high quality of the deliveries.

A brief summary of how the case companies regulated access to realize network effects, engage users and control quality is shown in the Table 4.

**Table 4: Regulating access**

<b>Case company</b>	<b>Strategies to regulate access</b>
<i>OrangeGrocer</i>	<ul style="list-style-type: none"><li>• Growth through a restricted geographical access</li><li>• Control entry: identity check and training</li></ul>
<i>GreenGrocer</i>	<ul style="list-style-type: none"><li>• Growth through restricted geographical access</li><li>• Control entry: identity check, training and rating system</li></ul>
<i>YellowGrocer</i>	<ul style="list-style-type: none"><li>• (Intention: Control entry: identity check, rating system)</li></ul>
<i>BlueShipper</i>	<ul style="list-style-type: none"><li>• Control entry: identity check</li></ul>
<i>PurpleShipper</i>	<ul style="list-style-type: none"><li>• Control entry: rating system</li></ul>
<i>BurgundyDeliverer</i>	<ul style="list-style-type: none"><li>• Growth through restricted geographical access</li><li>• Control entry: identity check, rating system</li></ul>
<i>IndigoDeliverer</i>	<ul style="list-style-type: none"><li>• Control entry: rating system</li></ul>
<i>AuburnDeliverer</i>	<ul style="list-style-type: none"><li>• Growth through restricted geographical access</li><li>• Control entry: restrict access only to existing delivery companies</li></ul>
<i>MaroonFood</i>	<ul style="list-style-type: none"><li>• Growth through restricted geographical access</li><li>• Control entry: restrict access only to employees</li></ul>

#### **4.4. Regulate interactions**

The second governance strategy, regulating interactions, involves controlling and restricting interactions between and within the entities on the platform (Hagiu 2014). By regulating access, platforms aim to achieve desired behavior in platform participants and in the interactions between them in order to control quality and realize positive network effects (Boudreau & Hagiu 2008).

In this section, I go through the strategies the case companies used to regulate interactions between the sides on their platform. Strategies included supporting open communication, regulating communication to support creation and consumption and controlling coupling process.

**Support open communication.** The crowdshipping platforms, where users were able to get anything delivered, believed an open communication to solve majority of the problems that the users would encounter. They also supported open pricing that allowed the users to determine the prices themselves. Hence, the crowdshipping platforms encouraged open communication to relieve themselves from participating in platform activities.

BlueShipper, PurpleShipper, BurgundyDeliverer and IndigoDeliverer sought to secure positive interactions between the deliverer and the orderer by enabling open communication within the platform. Open communication was supported in the form of a chat or a call to allow the users to talk openly to each other. Enabling communication was not only a mean to connect users and realize network effects but also to solve problems, such as optimization of time windows and unreliability. The users were able to agree on the delivery times, provide further information about the items delivered and the destination and contact each other when they encountered difficulties. For example, by allowing the users to call each other prior to, during and after deliveries through the platform application, BurgundyDeliverer outsourced problem solving, time window scheduling and informing to its users. Solving these issues would have otherwise required developing features onto the platform technology.

*“It’s two things we do: it’s matching and finding people and as soon as they’ve found each other letting them communicate and figure out the delivery. That’s kind of the two core things that we need to solve for people. [Because] people need to speak.” – PurpleShipper*

The interviewee in BurgundyDeliverer mentioned interactions as the most important factor for building a viable platform. Positive interactions, in turn, were secured by supporting communication between the users on the platform.

*“So the most important thing for [our service] and for any platform is interactions. It’s not a feature, it’s not a resource, but it’s actually what drives and multiplies [interactions] of any two-sided platform that connects people. - - You can’t beat the communication between the two sides. The most advanced technology may not be possible to solve the problem as efficiently as just the two sides calling to each other or texting to each other or chatting or you know chat system.” – BurgundyDeliverer*

The crowdshipping companies, BlueShipper, PurpleShipper, BurgundyDeliverer and IndigoDeliverer enabled open communication between the users in the form of a chat or a call. They did not even have measures to restrict the goods possible to be delivered on the platform (except for light monitoring over illegal deliveries). These services represented the least restricted crowdsourcing services of the sample in terms of interactions and access. All of these mainly operated with two sides, orderers and deliverers and their goal was solely to connect individuals that needed something delivered with those who would be able to provide their help.

**Regulate communication to support creation and consumption.** OrangeGrocer, GreenGrocer, YellowGrocer and MaroonFood were able to support creation of the deliverer and the consumption of the orderer by deploying features that automated some of the processes. Essentially, the features restricted the variety of interactions, made further communication less necessary and made the activities more efficient.

The platforms that focused on a specific category of products that people consumed on a daily basis seemed to impose more control on communication and interactions on the platform. Instead of supporting open communication, they deployed features that limited interactions but supported creation processes and consumption. Firstly, the grocery and restaurant delivery services, OrangeGrocer, GreenGrocer, YellowGrocer and MaroonFood, displayed lists of products on their platforms in order to facilitate buying and prevent misunderstandings. Naturally, this measure also controlled the variety of goods that the users were able to order and deliver through the platform. Secondly, payments were fixed and transacted automatically over the platform to reduce complexity and facilitate the purchase. Moreover, GreenGrocer, YellowGrocer and MaroonFood distributed the deliveries straight to the deliverer instead of allowing the orderer to choose the deliverer or the deliverer to choose the order. Hence, contrary to the crowdshipping companies, these platforms controlled and took part into the creation process themselves, which prevented negative interactions from occurring.

Also these case companies enabled open communication but only to an extent that was necessary for preventing negative interactions from occurring. OrangeGrocer guided deliverers to contact the orderer in the case of failing to deliver to a time slot and reply back with their available times, which was aimed at reducing customer disappointment. GreenGrocer allowed orderers to leave notes for further instructions so that the deliverer

would pick up the correct items, e.g., ripe avocados. AuburnDeliverer and MaroonFood, in turn, did not support any communication between the sides. However, both of these case companies represent the non-crowdsourcing example in the case sample: MaroonFood owned its own employees and AuburnDeliverer exploited businesses in their base of deliverers, which facilitated controlling quality.

It could be interpreted that controlling interactions was more crucial for some platforms than for others. Especially the grocery delivery platforms needed to control two separate phases in creation: the picking and delivering process. The previous was perceived complex for the quality control. Thus, these platforms needed to develop features that would support and facilitate both picking and ordering of items on the platform by displaying lists of groceries for orderers, among other features. Accordingly, both interviewees in crowdshipping platforms, BurgundyDeliverer and PurpleShipper mentioned that their users had delivered groceries but admitted that the platforms were not fit for the purpose as such because their platform design supported neither the picking of items nor selecting of items.

**Control the coupling process.** GreenGrocer, YellowGrocer, MaroonFood, PurpleShipper and BurgundyDeliverer aimed at making crowdsourcing of deliveries more efficient with an improved coupling process. Random coupling of the deliverer and the tasks resulted otherwise in long distances and slow deliveries. Instead of allowing the orderer to choose the deliverer or the deliverer voluntarily to choose the order, each delivery was assigned to the most suitable deliverer. By controlling the coupling process the platforms restricted the interactions between orderers and deliverer but were able to offer more reliable deliveries and faster responses.

These crowdsourcing goods delivery platforms distributed deliveries either automatically or manually to the crowds based on distance and ratings on previous deliveries. Both GreenGrocer and YellowGrocer deployed algorithms that automatically distributed an order to a deliverer once it was uploaded into the system by the orderer. The way the algorithm chose the deliverer varied between the two; both platforms took the distance to the orderer into account but GreenGrocer additionally applied the deliverer rating, which previous orderers had given to the deliverer, into the calculation. In MaroonFood, the restaurant orders that were ready for picking up were directed manually to an available deliverer closest to the restaurant.

The platforms were able to manage quality and efficiency by distributing the orders to the most suitable deliverers. Firstly, using the rating system to guide the order distribution helped weeding out poor quality drivers. This strategy contributed to higher quality. Unlike other platforms that deployed the rating system, GreenGrocer automated the decision process not allowing the orderers choose the deliverer based on the ratings.

Secondly, the order distribution aimed also at improving quality in terms of reliability and speed. Distributing orders to the deliverers closest to the orderers shortened the distance, which increased the rate of deliveries. Automatizing the process, in turn, ensured that the next deliverer was chosen quickly, if the first one denied, which further improved the total lead-time.

In both GreenGrocer and YellowGrocer, the assignment was, however, still voluntary and the deliverer could deny the task. In the case of denial, the algorithm would choose another suitable deliverer. The latter platform did not enforce any penalty on denying an order. In GreenGrocer, the deliverers chose beforehand the one-hour time slots when they would be available for deliveries. Then if they denied any order in the one-hour time frame, they wouldn't receive any more orders in that time slot. GreenGrocer's approach is, thus, closer to the MaroonFood's employee model, where the part-time deliverers were allocated beforehand into time slots.

The need for an improved coupling process was dependent on the product category a platform focused in. The grocery and food delivery platforms, GreenGrocer, YellowGrocer and MaroonFood, were the only ones to distribute the orders instead of allowing the users to do the choice. Indeed, in delivering perishable produces, frozen food and hot restaurant food time is a crucial factor, which presumably required these players to adopt a fast delivery system. Moreover, both groceries and restaurant food are commodities consumed in daily basis, which further necessitates a service with short lead times. Due to the nature of the deliveries in the crowdshipping platforms, crowdshipping companies were not able to benefit from as high existing volumes as grocery and food deliver platforms, which tapped into existing high-volume commodity product segment. Hence, orders could be on the platform for a longer period of time. For instance, in PurpleShipper the lead-time was often up to a week.

However, also crowdshipping companies aimed at improving the coupling process to an extent. As mentioned earlier, BurgundyDeliverer suggested orders for the deliverers but only after the user had announced his route. PurpleShipper, in turn, followed its users and suggested deliveries that were located on the route they frequented the most. This way PurpleShipper was able to exploit the long tail of the users – and supposedly shorten the lead-times of deliveries.

*“And that’s very satisfying for us to see that the long-tail of users where you might think that people are not active but they are. They are just waiting for the right thing.” – PurpleShipper*

Even though mainly focused on same-day deliveries, AuburnDeliverer did not deploy an automatic or manual order distribution system. Instead, the company simply uploaded pending orders onto the platform, where any of their multiple delivery partners could reserve and deliver it. However, AuburnDeliverer’s situation was different from the OrangeGrocer, GreenGrocer, YellowGrocer and MaroonFood’s. As the company offered deliveries to a large base of delivery businesses as a supplementary work to cover the costly idle time with, the deliverers were likely to deny an order. Interviewee mentioned the availability of their delivery partners as the greatest challenge in the model.

*“One of the main problem is sometimes is that they already have their days planned so we can’t really force them to do our deliveries if already have their planning booked. So sometimes it’s really hard to [get them to deliver].” – AuburnDeliverer*

Therefore, the time that would have taken a delivery to be accepted after multiple denials would have been longer than one of the many deliverers accepting a pending order. Thus, it was reasonable for AuburnDeliverer to propose deliveries via voluntary open call, which, in effect, is typical of crowdsourcing platforms.

**Summary.** Regulating of interactions was aimed at facilitating consumption and creation on the platform. Crowdshipping companies, which had relatively infrequent deliveries, supported open communication between the participants who then could agree on delivery schedules and locations and solve arising problems by themselves. In turn, the case companies that had been able to realize more frequent deliveries, imposed more control on the communication by developing features that supported more efficient consuming, i.e. buying products, and creation, picking and delivering. Crowdsourcing

goods delivery platforms regulated interactions also by controlling the coupling of tasks and the crowds in order to ensure the quality and efficiency of the deliveries.

A brief summary of how case companies regulated interactions between the sides to realize network effects, engage users and control quality is shown in the Table 5.

**Table 5: Regulating interactions**

<b>Case company</b>	<b>Measures to regulate interactions</b>
<i>OrangeGrocer</i>	<ul style="list-style-type: none"> <li>• Regulate communication to support creation and consumption</li> </ul>
<i>GreenGrocer</i>	<ul style="list-style-type: none"> <li>• Regulate communication to support creation and consumption</li> <li>• Control the coupling process</li> </ul>
<i>YellowGrocer</i>	<ul style="list-style-type: none"> <li>• Regulate communication to support creation and consumption</li> <li>• Control the coupling process</li> </ul>
<i>BlueShipper</i>	<ul style="list-style-type: none"> <li>• Support open communication</li> </ul>
<i>PurpleShipper</i>	<ul style="list-style-type: none"> <li>• Support open communication</li> <li>• Control the coupling process</li> </ul>
<i>BurgundyDeliverer</i>	<ul style="list-style-type: none"> <li>• Support open communication</li> <li>• Control the coupling process</li> </ul>
<i>IndigoDeliverer</i>	<ul style="list-style-type: none"> <li>• Support open communication</li> </ul>
<i>AuburnDeliverer</i>	<ul style="list-style-type: none"> <li>• Restrict communication totally between the sides</li> </ul>
<i>MaroonFood</i>	<ul style="list-style-type: none"> <li>• Regulate communication to support creation and consumption</li> <li>• Control the coupling process</li> </ul>

#### **4.5. Control creation**

Controlling creation was one of the governance strategies the companies adopted to achieve improved quality on the platform. Creation refers here to the crowds' value creation processes. In the crowdsourcing goods delivery platforms creation consists of activities related to picking and delivering the customer orders. The case companies controlled their crowds' creation by isolating picking as its own isolated process. This

strategy further increased the rate of the deliveries and made the delivery process more manageable.

**Divide crowds functionally.** GreenGrocer and BlueShipper divided crowds functionally into different parts of the value chain to control the crowds' creation process. They divided the picking of items and delivering into their own isolated processes. The strategy was aimed at accelerating the rate of deliveries in the high-volume areas. The stores that faced high demand got their own picking units, which were able to perform picking more efficiently. Further, the strategy facilitated controlling the quality, as the parts of the value chain were separated and working across the parts was disabled. However, for dividing crowds functionally the process had to be sequential, i.e., involving two or more phases, such as delivering and picking. Also high volume of deliveries in the area was required in order to maintain the platform economically viable.

These case companies separated the picking phase as its own isolated process either for chosen individuals or for the retailer handle. In GreenGrocer, one individual was trained for picking items in one store. She was assigned to pick the items ready for the crowds who would only deliver the orders to the orderers. Thus, GreenGrocer divided the creators functionally into the different parts of the value chain and restricted working across the different parts. This approach allowed GreenGrocer to apply more control into the picking phase, which was considered crucial for quality, and increase the rate of deliveries, as a separate picking unit made the picking process more efficient.

In BlueShipper's grocery deliveries, in turn, the retailer would pick up the items. Although mainly focused on shipping regular goods, on BlueShipper's platform the users delivered also groceries but they only picked up complete shopping bags with the orderer's purchases from a store. The grocer was in charge of organizing the picking phase, instead. Hence, BlueShipper had decided to move the responsibility and quality control away from the platform by denying the access into the most critical part of the value chain, which picking represented for grocery delivery services.

However, dividing crowds functionally required sufficient volume to support it. If the volumes decreased, the creators in the picking unit would have been left idle. The volume of orders needed to support constant picking in a store for the model to make economically sense and attract the creators who were responsible for picking.

Similarly to GreenGrocer, OrangeGrocer was planning to divide creation process into delivery and picking phases. However, the division would take place once the volume of deliveries reached a threshold where separating the picking and delivering process would make the respective processes more efficient. The company's deliverers were, thus, still in charge of both the picking and the delivering, which was the more viable model when the volume was limited and uncertain.

*“When you have volume you can maybe change your model from crowdsourced into more hybrid crowdsourced or as full-time basis. What you can do is, you can break the fulfillment into two pieces. - - You can have your fleet broken into two components. One component can be the picking side and second one can be the actual delivery side [doing the last-mile fulfillment]. - - I think it might be more economical to eventually to go down the model of doing it hybrid or maybe even a full employee level fleet if you have a volume to support it.” – OrangeGrocer*

None of the other case companies divided their creators functionally. Reasons were threefold. Firstly, most of the companies were initially strictly focused only on the last-mile delivery whereas grocery delivery services' value chain consisted of two distinct, sequential parts: picking and the last-mile delivery. For instance, a fundamental design decision for MaroonFood's business model was only to deliver ready-made restaurant food instead of including producing and cooking into the company or crowd's activities.

Secondly, only high volume enabled dividing crowds into the different parts of value chain. Although both OrangeGrocer and YellowGrocer had two clear sequential parts in their value chain, picking and delivering, they did not divide their crowds functionally because they did not have the volume to support either of the phases as an independent process, as described above. GreenGrocer had isolated the picking process only in the most frequented store in order to fulfil the orders faster.

Moreover, only grocery delivery services perceived the picking phase crucial for quality and, consequently, customer retention. Picking up the right groceries was important for quality, as delivering rotten or otherwise bad quality products would disappoint the orderer. From the case study sample, only GreenGrocer had separated picking as isolated process that they controlled and OrangeGrocer had considered it. In BlueShipper's

platform, the retailer was responsible of the picking phase only when groceries were ordered.

*“You’re dealing with people’s groceries and this is what people consume on a regular basis. So, yes, they’re [going to] be very careful about where they order from. So we have one chance.” – OrangeGrocer*

**Summary.** Two of the case companies controlled crowds’ creation by allocating individuals separately to either pick the groceries or to deliver them. Working across the two separated phases was restricted. The strategy allowed the case companies to increase the rate of the deliveries and control quality more efficiently.

A brief summary of how case companies controlled creation of the crowds to realize network effects, engage users and control quality is shown in the Table 6.

**Table 6: Strategies to control crowds’ creation**

<b>Case company</b>	<b>Controlling creation</b>
<i>OrangeGrocer</i>	• (Intention: divide crowds functionally)
<i>GreenGrocer</i>	• Divide crowds functionally
<i>YellowGrocer</i>	• Does not control creation
<i>BlueShipper</i>	• Divide crowds functionally (for grocery deliveries only)
<i>PurpleShipper</i>	• Does not control creation
<i>BurgundyDeliverer</i>	• Does not control creation
<i>IndigoDeliverer</i>	• Does not control creation
<i>AuburnDeliverer</i>	• Does not control creation
<i>MaroonFood</i>	• Does not control creation

## 5. Discussion

This chapter first summarizes the results of the whole study. Second, I discuss the contributions to theory on crowdsourcing and MSPs and practical implications for management of incumbent organizations and new players in the field. Finally, I evaluate the robustness of the study and suggest possible topics for future research.

### 5.1. Summary of the key findings

Crowdsourcing of deliveries presents an opportunity for platform owners to provide companies with cost efficient last-mile deliveries and added value for their end customers. However, due to the novelty of the industry, prior empirical research addressing lately emerged crowdsourcing goods delivery platforms is limited. The wide body of crowdsourcing literature had been mainly focusing on open source software project and crowdsourced problem solving, innovation and product design competitions and on other product development projects exploiting crowds. However, crowdsourcing in service applications, where inevitable interactions and goods exchange between the creator and the customer set certain restrictions on the practical implementation of the service, is less explored and theorized.

Moreover, the case companies explored in this study were not characterized only by their use of crowds but by their multi-sided markets. It is not yet fully understood how the common strategies typical of multi-sided markets, i.e., openness, pricing and governance strategies, apply to crowdsourcing platforms and, on the other hand, how strategies to engage crowds are shaped by multiple sides. Thus, the following research questions were formed.

*Q1. How do crowdsourcing goods delivery platforms engage their deliverers, realize network effects and control quality in multi-sided markets?*

*Q2. How do the platform strategies change throughout the life cycle of a crowdsourcing goods delivery platform?*

This qualitative multiple-case study aims at answering the two research questions by exploring strategies used in nine crowdsourcing goods delivery companies in multi-sided

markets. The case companies realized and maintained positive network effects, which are crucial for multi-sided markets, engaged crowds, who in the domain of deliveries were the deliverers, and maintained quality of co-created services in an adequate level with various pricing strategies and strategies that regulated openness, access, crowds' creation and interactions between the participant groups on platforms. The use of these strategies were presented and discussed in detail in Findings in sections 4.1, 4.2, 4.3, 4.4 and 4.5, respectively.

The case study discovered the antecedents of the various strategic choices by inspecting the reasoning of the case companies behind each. The strategies were not only affected by the business model that the case companies had initially chosen but by the scale of the platform. The analysis showed how these strategies were used sequentially throughout the different phases of the life cycle of a platform. In the early stages of the life cycle, the strategies were aimed at gathering a critical mass of users to ensure reliable deliveries and building up a functional platform from the beginning. Once the amount of deliverers matched the order demand, the money side shifted from the orderer to the deliverer side or possibly to the retailer side, if the platform was able to persuade them to join as a new side. The case companies that used open pricing system were to monetize the platform only after gathering sufficient amount of users and realizing viable interactions between them. After the platforms had gained sufficient amount of users to realize strong network effects, they also imposed access and interactions regulation mechanisms and integrated to the deliverer side in order to control quality more efficiently.

Next, I discuss the practical and theoretical implications of the findings.

## **5.2. Implications of the study**

This study has contributions to the research of crowdsourcing platforms. Firstly, I synthesized a large body of literature to build a comprehensive analytical framework that enables structural analysis of crowdsourcing platforms that operate in multi-sided markets. The framework provides a base for further research on emerging service-oriented applications in the crowdsourcing platforms where multiple sides might take place and where creators and consumers are overlapping entities. The framework is presented in the Literature Review section. These contributions will help future research on crowdsourcing goods delivery platforms, in particular.

Secondly, the thesis filled the research gap by revealing strategies used in crowdsourcing goods delivery platforms in multi-sided markets by using the aforementioned framework. These strategies are discussed in detail in the Findings section. Even the real-life applications of crowdsourcing goods deliveries are still new and explorative empirical studies on the subject are very few. Hence, this study sheds light on the topic among the first ones.

Moreover, this study yields practical implications for the management. Managerial implications are important both for incumbent organizations who are considering integrating a crowdsourcing model as part of their activities and for emerging players in crowdsourcing industry. As implications are different for the management of incumbent organizations than for the new players, the strategies are discussed taking the maturity of markets into account in the Findings.

Next, I further discuss the theoretical and practical contributions to platform strategies in crowdsourcing goods delivery companies that operate in multi-sided markets. The crowdsourcing goods delivery platforms combined strategies typical of crowdsourcing and MSPs. However, this study revealed also new strategies that were adopted to make the platform viable. The findings also show the strong influence of scale on strategic choices on platforms that previous empirical research neglects.

### **The altering nature of pricing**

This study shows how pricing strategies are changed throughout the stages of a platform's life cycle. The crowdsourcing goods delivery platforms did not hold to initial pricing decisions but varied them, instead. This study also reveals an interconnection between openness and pricing.

The analysis shows that platforms change subsidy sides and money sides when pursuing different strategic goals. Prior literature recognizes that on MSPs the platform provider may need to subsidize a single side's users that hold great value for the other sides in order to make the platform grow. However, prior research fails to recognize that subsidy-side and money-side may change over time. This study shows how crowdsourcing goods delivery platforms moved from subsidizing deliverers to subsidize the ordering customers, instead. This change took place when the amount of deliverers was enough to

match the order demand. The platforms started to subsidize the orderer side to attract them in increasing number and thus further grow the platform.

Further, opening a platform for new participant group enabled engaging the original user groups. Although openness strategies are discussed in MSP literature, this study shows how openness brings a new dimension to consider in pricing of crowdsourcing goods delivery platforms. For example, by opening the platform for retailers to participate, the crowdsourcing goods delivery platforms were able to subsidize the orderer side, while still maintaining remuneration high for the deliverer.

### **Combined environment of crowdsourcing and MSP**

The case companies combined strategies that are typical of MSPs and crowdsourcing environments. Many of the identified strategies were described either in the literature related to MSPs or to crowdsourcing. The interviewees emphasized consistently strategies from the both domains as crucial for viability. These strategies were used to complement each other. Therefore, as hypothesized in the Literature Review section, it is important to consider crowdsourcing platforms operating in multi-sided markets.

There were two strategies that were identified from prior crowdsourcing literature. First, controlling coupling process is a common mean to improve efficiency and quality in crowdsourcing environments (Satzger et al. 2013). Tasks and the creators may be coupled more beneficially by distributing tasks based on previous performance or domain of interests, for instance. Second, dividing crowds to pick and deliver order separately can be identified from crowdsourced product development. As described in the chapter 2, in software product development crowds' activities may be separated into more manageable tasks. TopCoder, for instance, organized contests separately in architecture, software design and testing (Boudreau & Hagiú 2008).

The case companies adopted also strategies that were identified from MSP literature. For example, crowdsourcing goods delivery platforms subsidized sides and integrated into a side by offering substitutive products and services. These strategies were appeared constantly in MSP literature (e.g., Hagiú 2014), as discussed in the Literature Review section.

The crowdsourcing and MSP strategies, which the case companies adopted, appeared to be complementary. For instance, subsidizing a side and controlled coupling process complemented each other. Subsidizing a side essentially aims at engaging the users by giving the deliverers higher monetary compensation or by lowering prices for the orderer. However, also more beneficial coupling process could be considered as subsidizing a side, as it provided deliverers with higher profits and orderers with lower prices. The aim of this strategy was to make deliveries more cost efficient, for instance, by distributing the orders always to the deliverers that were the closest to the orderers.

### **Strategic decisions' antecedents on crowdsourcing goods delivery platforms**

This study sheds light on the characteristics that affect the strategic decision-making on crowdsourcing goods delivery platforms. As concluded in the Literature Review section, empirical research on the topic is limited. Therefore, this study yields important managerial implications, as it clarifies the antecedents of strategic decisions in the case companies.

These antecedents include the volumes that the nature of the products possible entails and the importance of proximity in physical deliveries. Firstly, crowdsourcing goods delivery platforms need to take the nature of the commodities they offer to be delivered into account. If a platform offers deliveries for goods that are consumed on a daily basis, they need to support communication accordingly. Grocery and food delivery platforms, OrangeGrocer, GreenGrocer, YellowGrocer and MaroonFood, provided lists of products and restricted open communication to minimum to make interactions more efficient. On the contrary, on crowdshipping platforms, BlueShipper, PurpleShipper, BurgundyDeliverer and IndigoDeliverer, where the services are needed less frequently, only open communication was supported. Further, the latter group of case companies imposed also an open pricing system where users determined the prices themselves. Thus, they relieved themselves from regulating interactions and allowed users to sort out the delivery times, prices and possible issues.

Secondly, the findings emphasize the importance of growth through restricted access. Prior literature recognizes the need to limit growth to achieve higher quality (Evans 2003; Boudreau & Hagi 2008) but this study revealed the motives for restricting growth on the crowdsourcing goods delivery platforms, in particular. In goods deliveries, the likelihood

of relevant connections increases when the service is offered in the limited area due to the proximity of deliverers and orderers. Therefore, limited geographical access helped crowdsourcing goods delivery companies in building a viable platform. Surprisingly, this holds true for the long-distance deliveries, as well. PurpleShipper had considered targeting their service most populous cities in the country, thus tapping into high trafficked routes. Restricted access would increase the likelihood of relevant connections for crowdshipping companies, too.

### **5.3.Evaluation of the study and limitations**

This thesis is, by nature, an abductive study where findings are derived inductively from the data. Thus, findings drawn from qualitative data are always prone to biases caused by subjective interpretation of the author. In addition, the author has to limit the number of interviews, narrow down the literature chosen for the thesis and decide when sufficient saturation is reached. Although the sample size was rather limited, the themes that surfaced in the interviews started eventually to follow the same patterns that had emerged from previous interviews. Moreover, a case study based on nine companies is sufficient to reach reliable enough conclusions in the limits of a master's thesis.

However, the sample was limited in other ways. The sample mainly consisted of companies that were slightly more than one year old. Some of the case companies were still defining their platform design and experimenting with different models. The case companies probably had not had enough experience to create the best practices and refine their business models. However, this appears to be the case with the whole industry characterized by countless amount of new entrants leveraging the latest technologies. Possible biases caused by the young age of the case companies were constrained by adding more established players that were more than five years old or received a significant amount of funding.

The findings are also susceptible to biases caused by different circumstances that companies were exposed to. Even though the players operated in the domain of deliveries, the sample might suffer from too low coherency: almost all the companies were situated in different countries where market conditions and people's behaviour, in particular, vary. Thus, in the geologically scattered sample, the case companies might be affected by divergent factors that are not related to the study.

In the Findings, the case companies' performance and strategic decisions are reflected through their scale. However, neither the scale nor the performance is quantified. Many companies were reluctant sharing the data related to their performance and companies were received varying amounts of funding which naturally facilitates some to scale up and perform better. Instead, the interpretations solely relied on comments of the interviewees and the author constructed descriptive sequential contexts, such as launch, time before partnerships, first partnerships, which reflected the company scale and performance. However, before being able to quantify the metrics conducting a qualitative exploratory research was necessary. The highly descriptive verbal illustrations on the performance gave understanding on the subject and on the metrics that really yield value for crowdsourcing platforms in multi-sided markets.

#### **5.4.Future research**

As the study was focused in the domain of deliveries that, naturally, sets restrictions on the possible platform design, future research could extend these findings to other industries. Sharing economy has its applications in nearly every industry and many of them are only lately emerged and have their own implications on a possible design representing interesting research subjects. Similarly, comparing traditional strategies to the ones used in various sharing economy applications and how the context affects the strategic choices represent interesting research topics.

As the industry evolves, the future research could examine the outcomes of different practices typical of crowdsourced platforms. Quantifying and comparing the key performance indicators of surviving players would reach more accurate results on the best practices that entail success. This would clarify also the consequences of different crowdsourcing and MSP strategies.

This study explored the use of price and non-pecuniary mechanisms in a high level in the context of multi-sided crowdsourcing platforms in the domain of delivery. The use of the two mechanisms is highly dependent on the context. The future research could study more precisely the right balance of price and non-pecuniary mechanisms to engage crowds and how different context affect them. This study explored the use of the two in the context of crowdsourcing in multi-sided markets in the service domain but neglected more precise evaluation of their balance.

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# APPENDIX

## The guiding interview questions

- What does the company do?
- Who are the different user groups in your service?
  - Does the company have partnerships with retailers?
- How do each benefit from using the service?
  - What are the benefits for retailers?
- What are the main benefits in crowdsourcing grocery deliveries?
  - How have you exploited these?
- What are the main issues and obstacles in crowdsourcing grocery deliveries?
  - How have you solved these?
  - How the chicken-and-egg/critical mass/initial mass problem should be solved?
- What are the other these kind of possible effects in crowdsourcing services that would either further encourage or hinder the use of your service?
  - How have you exploited/solved these?
- What are the most important (aspects, processes, features, processes, resources or activities) for making your service (and other services alike) viable and eventually turn to profit?
  - Why?
- How are the prices determined for each user group?
  - Why?
- Where does your revenue come from?
- How would you describe the company's cost structure?
- How do you pay/reward your drivers/shoppers/deliverers/crowds?
- Can any one become a deliverer?
  - How do you control it?
- What are the possible quality issues
  - How do you ensure it in your service?
- What other control do you have over the crowds or interactions between the different user groups?
- What makes your service convenient, beneficial, inspiring, or/and motivational for each user group?
  - How do you further encourage the use of your service for each side (features)?
- How are you going to scale? What will be changed?