

MOBILITY-AS-A-SERVICE: ATTRACTING PARTICIPATION OF  
SERVICE PROVIDERS TO A MAAS PLATFORM

Case: MaaS Global – Whim app

Master's Thesis

Anh Huynh

Aalto University School of Business

MSc Degree Programme in Strategy

Spring 2020

<b>Author</b> Anh Huynh		
<b>Title of thesis</b> Mobility-as-a-Service: Attracting participation of service providers to a MaaS platform		
<b>Degree</b> Master of Science in Economics and Business Administration		
<b>Degree programme</b> MSc Degree Programme in Strategy		
<b>Thesis advisor(s)</b> Ville Eloranta		
<b>Year of approval</b> 2020	<b>Number of pages</b> 96	<b>Language</b> English

### Abstract

Platform business model has disrupted and transformed industries around the world. It allows organizations to revolutionize their value chains and tap into a diverse pool of external players, resulting in accelerated innovation and value creation. Platform business has extended beyond technology-driven industries to more traditional and less digital ones. This study examines how platform could reshape the traditional transportation industry, using the case study of Mobility-as-a-Service (MaaS) – an innovative mobility ecosystem that integrates various transport modes and offers them as a mobility service package via one interface.

The ability to attract participants is vital to a platform's success. This overarching purpose of this study is to understand what motivates different stakeholders, such as public and private transport service providers, to join a MaaS platform and how a MaaS operator (the platform owner) could attract them to its ecosystem to improve urban transport.

The empirical research was conducted as an intensive embedded single case study, focusing on the MaaS ecosystem in the Helsinki capital region (MaaS Global Oy/Whim app). Research data was collected through ten semi-structured interviews with the founder of MaaS Global and representatives of public and private transport service providers. Data analysis followed standard steps of qualitative content analysis, including transcription, within-interview analysis, cross-interview analysis, and synthesis. Moreover, the research findings were reviewed against existing literature to improve quality and validity of the findings.

The research concludes that the motivations of platform participants are mostly extrinsic and include both monetary and non-monetary types of motivation. The motivations can be categorized under four main themes: financial gains, reputation and credibility, learning benefits, and social contribution. Additionally, the findings also demonstrate that a platform owner can leverage four facilitating drivers to influence platform participation: expected rewards, a sense of autonomy, a sense of competence and a sense of relatedness. In practical terms, a strong business case with clear financial gains is vital to attract platform participants. Furthermore, the platform should be perceived as transparent and fair, which includes clear pricing and earning logic, and clear decision rights, procedures and data exchange. Finally, supporting resources regarding technical integration, such as testing and toolkits, are also considered as important in facilitating platform participation.

---

**Keywords** Mobility-as-a-Service, platform, motivation, ecosystem, innovation

---

## ACKNOWLEDGEMENTS

Firstly, I would like to give special thanks to my thesis supervisor, Ville Eloranta, for his invaluable guidance during the thesis project. His advices helped me overcome multiple roadblocks and steered me to the right direction while giving me the freedom to develop this paper with my own approach and thinking.

I would also like to thank representatives from the transportation service providers, both Whim's partners and non-partners, who kindly participated in the interviews and provided vital insights, without which this paper could not be completed.

Moreover, I would like to particularly thank Mr. Sampo Hietanen, the CEO of MaaS Global, who believed in my research proposal and allowed me to conduct the thesis project with Whim as the case company. In addition, I am grateful for the support of JP Tanhuala, Iitu Leinonen and other employees from MaaS Global, who connected me with their transportation partners and introduced me to the fascinating world of Mobility-as-a-Service.

I would like to express my gratitude to the Aalto University School of Business for providing a supportive environment with high-quality teaching, and learning opportunities for my academic curiosity and career development. My experiences have been interesting, international and most importantly intellectually stimulating, which will accompany me in my next chapters as a young professional.

Lastly, I would like to especially thank my family and friends for their constant support and encouragement, not only during the thesis process but also my entire studies. Without them, I would not have been able to accomplish my goals and be where I am today.

Thank you.

Anh Huynh

Helsinki 02.06.2020

## DEFINITIONS

<i>Platform</i>	A platform can be loosely defined as a product, service or technology which serves as a foundation upon which complementary products, services or technologies can be built by external agents (Gawer, 2009; Porch, Timbrell & Rosemann, 2015).
<i>Platform owner</i>	Platform owner is the focal firm who has the primarily responsible for the development trajectory of the platform (Tiwana, 2013).
<i>Platform complementors</i>	The term “complementor” is a short version for “the developer of a complementary product or service” that extend the platform’s native functionalities (Cusumano & Gawer, 2002; Gawer & Henderson, 2007).
<i>Mobility-as-a-Service</i>	In this study, Mobility-as-a-Service refers to “a user-centric, intelligent mobility distribution model in which all mobility service providers’ offerings are aggregated by a sole mobility operator and supplied to users through a single digital platform” (Kamargianni & Matyas, 2017).
<i>MaaS operator</i>	MaaS operator is the middle player between service providers and users. MaaS operator leverages data and purchases capacity from various transport service providers via secure APIs, bundles it then resells to users via one integrated interface. Additionally, MaaS operator can suggest the best routes by combining different transport modes based on their knowledge of real-time traffic network (supply side) and user’ preferences (demand side) (Kamargianni & Matyas, 2017). In this study, a MaaS operator assumes the role of a platform owner.

*Transport or  
mobility service  
providers*

Transport or mobility service providers are one of the core suppliers to the MaaS platform. They offer transportation and mobility-related services, such as taxis, car rental, public transportation, parking, toll operators, etc. They sell their capacity and provide access to their data to the MaaS operator via secure APIs (Kamargianni & Matyas, 2017). In this study, transport service providers assume the role of platform complementors.

# TABLE OF CONTENTS

<b>1</b>	<b>INTRODUCTION .....</b>	<b>1</b>
<b>1.1</b>	<b>Mobility-as-a-Service.....</b>	<b>2</b>
<b>1.2</b>	<b>Research objectives.....</b>	<b>3</b>
<b>1.3</b>	<b>Structure of the thesis.....</b>	<b>4</b>
<b>2</b>	<b>LITERATURE REVIEW .....</b>	<b>5</b>
<b>2.1</b>	<b>Classification system of platform business .....</b>	<b>5</b>
2.1.1	Industry platform.....	7
2.1.2	Multi-sided platforms .....	10
<b>2.2</b>	<b>Mechanisms to incentivize platform participation .....</b>	<b>11</b>
2.2.1	Platform architecture.....	12
2.2.2	Platform governance .....	13
<b>2.3</b>	<b>Motivation for platform participation .....</b>	<b>18</b>
2.3.1	Motivation in platform business literature .....	18
2.3.2	Motivation in Open Source Software literature .....	19
2.3.3	Drivers that facilitate motivation.....	26
<b>2.4</b>	<b>Theoretical framework.....</b>	<b>28</b>
<b>3</b>	<b>METHODOLOGY .....</b>	<b>30</b>
<b>3.1</b>	<b>Research approach .....</b>	<b>30</b>
<b>3.2</b>	<b>Data collection.....</b>	<b>33</b>
<b>3.3</b>	<b>Data analysis .....</b>	<b>35</b>
<b>3.4</b>	<b>Research evaluation.....</b>	<b>36</b>
<b>4</b>	<b>FINDINGS .....</b>	<b>38</b>
<b>4.1</b>	<b>Towards the future of mobility .....</b>	<b>38</b>
<b>4.2</b>	<b>Mobility-as-a-Service from the platform provider's perspective .....</b>	<b>39</b>
	Vision .....	40
	MaaS Global's business model.....	41
<b>4.3</b>	<b>Factors that encourage service providers to join a MaaS platform.....</b>	<b>43</b>
	Industry trends .....	43
	Financial gains.....	44

Reputation and credibility .....	48
Learning .....	49
Partner relationship .....	50
Social contribution .....	51
Transparency and convenience .....	52
<b>4.4 Factors that discourage service providers to join a MaaS platform .....</b>	<b>52</b>
Cost consideration .....	52
Control .....	54
Uncertainty .....	56
<b>4.5 Summary of key findings .....</b>	<b>57</b>
 <b>5 DISCUSSION AND ANALYSIS .....</b>	 <b>59</b>
<b>5.1 Review Mobility-as-a-Service model through platform business lens .....</b>	<b>59</b>
<b>5.2 Motivations .....</b>	<b>62</b>
Monetary benefits .....	62
Non-monetary benefits .....	63
<b>5.3 Platform design .....</b>	<b>64</b>
Pricing .....	64
Transparency and convenience .....	65
Ownership of customers, data and brand .....	66
<b>5.4 Facilitating drivers that impact motivations to join a platform .....</b>	<b>67</b>
<b>5.5 Levers to motivate participants .....</b>	<b>69</b>
<b>5.6 Revised theoretical framework .....</b>	<b>71</b>
 <b>6 CONCLUSION .....</b>	 <b>74</b>
<b>6.1 Main findings .....</b>	<b>74</b>
<b>6.2 Practical findings .....</b>	<b>75</b>
<b>6.3 Limitations of the study and suggestion for further research .....</b>	<b>76</b>
 <b>REFERENCES .....</b>	 <b>78</b>
<b>APPENDICES .....</b>	<b>87</b>

## **LIST OF TABLES**

Table 1. Summary of platform definitions .....	9
Table 2. Summary of levers used to incentivize platform participation .....	17
Table 3. Summary of motivation types .....	24
Table 4. Meta-data on interviews .....	34

## **LIST OF FIGURES**

Figure 1. A classification system of platform business .....	6
Figure 2. Categories of industry platform .....	10
Figure 3. Levers to incentivize platform participation.....	16
Figure 4. Motivation types (adapted from Battistella & Nonino, 2012).....	23
Figure 5. Drivers that facilitate or undermine motivations .....	27
Figure 6. Theoretical framework .....	29
Figure 7. MaaS ecosystem framework (Kamargianni & Matyas, 2017) .....	32
Figure 8. Encouraging and discouraging factors for platform participation .....	58
Figure 9. Illustrative Mobility-as-a-Service development stages.....	62
Figure 10. Revised theoretical framework .....	73



# 1 INTRODUCTION

What do the world's largest corporations, such as Apple, Microsoft, and Google, have in common? While they have different products, functions, and structures, they all share one common feature: the platform-based business model. Powered by information technology (IT) transformation, the platform businesses provide the online infrastructure that enables people, organizations, and resources to interact with one another, creating and capturing significant amounts of value. Evan and Gawer (2016) suggest that platforms' substantial contribution to the global economy is due to their ability to improve productivity through highly efficient matching, asset utilization and innovation acceleration.

The market value of platform businesses worldwide is estimated to exceed \$4 trillion (ibid). We are all familiar with the tale of platform giants, such as Airbnb and Uber, who have managed to rearrange industry boundaries and roles, redefine value creation mechanisms and disrupt the entire industries all within less than a decade (Parker, Van Alstyne & Choudary, 2016). Some industries have already been disrupted by platform business, such as social media, books, and music, whereas in some other industries it is just the beginning. Some researchers even compare the power of platforms to transform the global economy to that of the industrial revolution (Kenney & Zysman, 2016). As Parker et al. (2016) put it, the platform revolution is here.

In essence, value creation in a platform business is enabled by interactions between external producers and consumers and thereby the exchange and consumption of goods and services (Parker et al., 2016). In traditional businesses, the value chain is typically linear with producers at one end and consumers at the other. However, the platform business model triggers a shift towards a complex value matrix, in which producers and consumers jointly create, exchange and consume value in multiple ways (ibid). Platform businesses turn the locus of activities inside out, relying on an external network of complementors to innovate and respond to diverse customers' needs at a faster speed and bigger scale than ever before (Cusumano & Gawer, 2002; Kenney & Zysman, 2016; Van Alstyne et al., 2016). Additionally, platforms have a distinctive characteristic called network effects, which essentially means that more users attract even more users, a dynamic that generates a self-sustained cycle of growth (Evans & Gawer, 2016; Van

Alstyne et al., 2016).

So perhaps it is no wonder that the number of businesses who have adopted platform thinking in recent years has increased considerably and across industries (Kenney & Zysman, 2016). What is worth noting is that platform business is no longer the territory of tech and born-digital organizations but it also extends to a wide variety of industries, from healthcare to machinery to education (Accenture, 2016; Evans & Gawer, 2016). Yet, despite the attention platform business model has received from both firms and scholars, there are gaps in our knowledge and its dynamics and development direction is still unclear (Evans & Gawer, 2016; Kenney & Zysman, 2016).

In particular, existing literature on platform business focuses mainly on technology-driven industries, leaving a potential research area on the application of platform thinking in industries that have been considered to be more traditional and less digital type. My research aims to contribute to that gap by examining the new disruptive phenomenon of the transportation industry using the theoretical lens of platform business. That phenomenon is the focus of my thesis – Mobility-as-a-Service.

## **1.1 Mobility-as-a-Service**

According to the United Nations, by 2050 the world's population is estimated to reach an unprecedented size of almost 10 billion people, of which two-thirds will live in urban areas. It means adding 2.5 billion people to the world's urban population, an increase of over 70% comparing to 2011 (United Nations, World Population Prospects 2017). Population rise inevitably increases the demand for travel and transport. Additionally, vehicle ownership is estimated to double by 2030 (Dargay, Gately & Sommer, 2007), adding pressure to the already-overcapacity urban infrastructure. Put in another way, the existing urban infrastructure cannot sustain such an increase in the number of vehicles, congestions, and pollution, yet building new infrastructure is not always feasible (Bouton, Knupfer, Mihov & Swartz, 2015). This growing pressure together with the public expectation to reduce transport emissions to tackle climate change necessitates the emergence of an innovative mobility solution that can offer a more efficient and sustainable way to deliver and consume transport (König, Eckhardt, Aapaoja, Sochor & Karlsson, 2016). In this context, the concept of Mobility-as-a-Service (MaaS) was born in 2014 (Hietanen, 2014).

As a newly emerged concept, MaaS is still evolving with new services continuously being added (Holmberg, Collado, Sarasini, & Williander, 2016). Therefore, there is not one single universally accepted definition of MaaS (Holmberg et al., 2016; Kamargianni, Li, Matyas & Schäfer, 2016). König et al. (2016:10) define MaaS as the following:

*“Multimodal and sustainable mobility services addressing customers’ transport needs by integrating planning and payment on a one-stop-shop principle.”*

Kamargianni & Matyas (2017) elaborates the term MaaS as an intelligent mobility service package which integrates seamlessly various transport modes, such as car rental, bus, and taxi, and is offered to consumers through a single digital platform. Hietanen (2014) defines MaaS as a mobility distribution model aiming to meet consumers’ transportation needs by offering mobility services across different modes via one interface. Across definitions, three common elements that define a MaaS ecosystem emerge: multimodal mobility package, one single integrated interface, and personalized mobility service. Specifically, a MaaS system typically includes an intermodal journey planner, a booking system, easy-payment and real-time information (Kamargianni et al., 2016). Put it more simply, instead of owning a car, consumers can alternatively buy a mobility package that includes all kinds of transport modes and is tailored to their personal needs.

## **1.2 Research objectives**

Being able to attract participants determines whether a platform is successful or not (Gawer & Cusumano, 2008). To achieve that, the platform owner needs to understand the motivations of participants and how to stimulate them (Antikhainen & Väättäjä, 2010). Building on that premise, my study aims to discover how a Mobility-as-a-Service could attract different actors to join the platform to improve urban transport. The empirical setting of this study is the MaaS ecosystem in Helsinki. The research problem is investigated through the following research questions:

*Research Question 1: What motivates transport service providers to join a MaaS ecosystem?*

*Research Question 2: How could a MaaS operator attract service providers?*

The research questions are empirically important because the MaaS concept is novel and attracts a great amount of attention not only in Finland but also worldwide. However, it

is still significantly under-researched with little scientific literature available (Holmberg et al., 2016). Furthermore, because MaaS is in its early phase, the business model is evolving with loosely defined boundaries, presenting an interesting research area in which applying platform-thinking might yield promising results.

### **1.3 Structure of the thesis**

This thesis has of six chapters. In chapter 2, I review the relevant literature to this study. In particular, theories related to platform business and motivation are discussed in-depth. At the end of the chapter, key findings of the literature review are summarized and a theoretical framework is presented, which serves as a guideline for the empirical part of my study.

Chapter 3 introduces the research methodology. Specifically, I explain my research approach as well as how the data is collected and analyzed. The chapter ends with an evaluation of the research based on common methods in empirical social studies.

Chapter 4 discusses the empirical findings of my thesis. The chapter consists of four sub-chapters. The first two sub-chapters provides the viewpoints of the interviewees on the future of mobility and Mobility-as-a-Service concept. The next two sub-chapters provide a detailed review of the main findings, including factors that encourage and discourage platform participation.

Chapter 5 provides an in-depth analysis and discussion of the findings. The objective is to make sense of what the findings mean and to connect them with existing theories. The analysis allows revision of the theoretical framework introduced in chapter 2.

Finally, chapter 6 concludes the thesis with a summary of key findings and their practical suggestions. I conclude the thesis by reviewing the limitations of the study and suggesting potential topics for future researchers.

## **2 LITERATURE REVIEW**

The concept of platform business has become increasingly popular in the past years. The success of tech giants such as Facebook, Amazon, Airbnb and the like has proven the significant role of platform in value-creation (Eisenmann, Parker & Van Alstyne, 2011). The literature about platform is characterized as a newly developed field with an exponentially increasing number of studies (Thomas, Autio & Gann, 2014), some of which can be inconsistent or even contradicting with each other (Porch, Timbrell & Rosemann, 2015). It means that any attempt to classify different types of platform will be somewhat incomplete. However, it still offers a potentially relevant lens to understand and make sense of my research. Therefore, my literature review starts with a summary of different platform categories which is then used to develop the justification for the business model of the case company. It is then followed by a review of various mechanisms that a platform owner uses to run its ecosystem. I will then venture to the field of psychology to gain a deeper understanding of the motivations of players in an open innovation ecosystem. As a result, my theoretical framework is built on two domains: platform and motivation theories.

### **2.1 Classification system of platform business**

Platform can be conceptualized as a type of meta-organization that can evolve and fluidly extend its boundary from internal to external organizations (Gawer, 2014). There is no unified definition of what a platform business is, and it can get complicated to try to find one because each theoretical perspective offers its version of platform definition. To avoid limiting myself to one specific perspective, I choose to follow the broadest explanation in which the term ‘platform’ refers to products, services or technologies that function as a foundation upon which complementary products, services or technologies can be built upon (Gawer, 2009; Parker & Van Alstyne, 2005). Another way to distinguish a platform business is that its value chain is not linear like that of a traditional business.

Porch et al. (2015) remark that the definition and categories of ‘platform’ have evolved in the literature over the years to reflect the development of the phenomena, moving from internal product platform to external platform ecosystem (figure 1). At the highest level, platform can be categorized into firm-internal and firm-external types (ibid). As

mentioned earlier, it is important to understand that platforms are not static but rather evolving organizations (Hagiu, 2006; Gawer, 2014). It means that a platform's business model can change over time when it moves from startup to mature stage. Furthermore, a traditional business can also eventually turn to platform business. The complexity of a platform increases when it moves from internal towards external platform (Thomas et al., 2014).

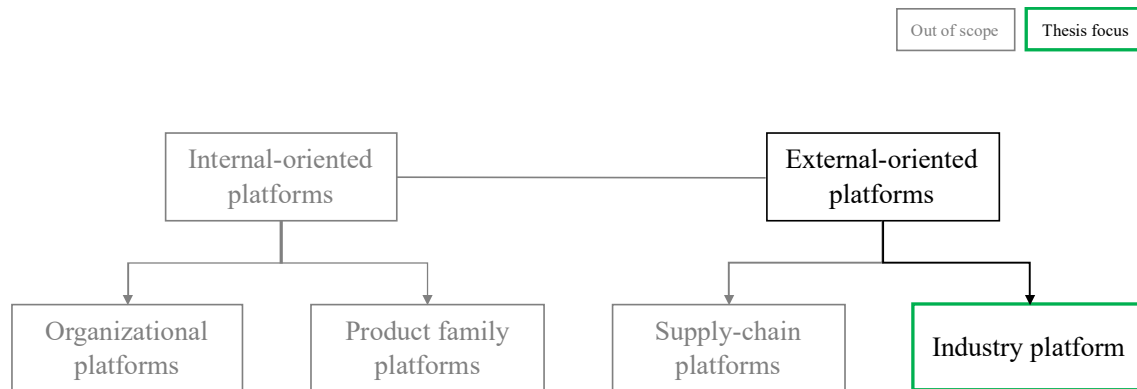


Figure 1. A classification system of platform business

The participants of internal platforms are the firm and its sub-units (Gawer, 2014). In essence, internal platforms comprise common organizational resources, subsystems, and capabilities based on which product development is built to decrease time and cost to expand product portfolio. Under *firm-internal platforms*, there is *organizational platform* which focuses on organizational and dynamic capabilities that enable firms to respond and adapt to external changes (Teece, Pisano & Shuen, 1998) and *product family* (Simpson, 2004; Jiao, Simpson & Siddique, 2007; Boudreau, 2010) which emphasizes on the technical architecture of the product or service to enable flexible and efficient product diversification. The most common examples of these internal platforms are from automotive manufacturing applications, machine tools and electronic devices (Porch et al., 2015). I will not go deeper into the literature of internal platform because it is not the business model of the case company, and thus, is out of scope.

At the turn of the century, with the emerging dominant role of technical platforms that fuel the competition in the personal computer industry, the focus of platforms extends beyond a firm's boundary. Research about firm-external platforms focus on two aspects: facilitation of complementary products or services developed by external agents, and interaction between two or more different participant groups, of which at least one side

plays the demand-side and the other plays the supply-side (Porch et al., 2015). There are two types of *firm-external platforms*. The first one is *supply-chain platform* which focuses on the interdependence between an assembler and its suppliers (Brusoni, 2005). This is also not within the scope of my thesis. The other type is *industry platform* (Thomas et al., 2014; Gawer, 2014), which is a technology-based innovation hub, in which a focal firm (platform leader) opens its technical interface and invites external agents (complementors) to develop complementary products or services for the platform (Gawer & Cusumano, 2008; Parker & Van Alstyne, 2005; Thomas et al., 2014). In industry platform, the platform leader relies on complementary products provided by independent external agents and thus, relinquishes its full control of the system to allow unintended innovation and new use case to emerge (Cusumano & Gawer, 2002; Gawer & Henderson, 2007; Parker & Van Alstyne, 2005). Typical case studies of this stream include Intel (Gawer & Cusumano, 2002) and Wikipedia (Garud, Jain & Tuertscher, 2008). Since industry platform is the focus of my thesis, it will be reviewed in further details in the following sub-chapter.

### **2.1.1 Industry platform**

Industry platform can be analyzed from two perspectives: industrial economics and engineering design. It is necessary to emphasize that there is no clear boundary between the two perspectives and most platforms demonstrate characteristics of both (Gawer, 2014).

The economic theoretical perspective examines platform as types of markets (two-sided and multi-sided) that facilitate transactions between different groups of customers (Rochet & Tirole, 2003; Evans, Hagiu & Schmalensee 2006; Armstrong, 2006). From an economic viewpoint, platforms create value by connecting and coordinating between two (or more) customer groups through effective pricing mechanisms (Gawer, 2014). At the very center of the economics research line lies the concept of network effects, which is divided into direct and indirect network effects. Indirect network effects indicate that the benefits to a user on one side of a platform depend on the number of users on the other side, hence, it is also referred as cross-side network effects (Evans, 2003; Hagiu & Wright, 2013; Gawer & Cusumano, 2014; Hagiu, 2014). Direct network effects mean that the benefits to a user on one side of a platform depend on the number of users on that same side, hence, it is also referred to as same-side network effects (Gawer & Cusumano, 2014).

Network effects can be positive or negative. When the number of platform participants increases, positive network effects mean the platform has a higher value to a participant, whereas negative network effects mean lower value (Tiwana, 2013). Researchers pay significant attention to network effects because of its crucial role in driving growth and scalability of a platform (Rochet & Tirole, 2006; Hagiu, 2006). By viewing a platform as a marketplace, the economic perspective focuses on a specific challenge of bringing multiple sides on board (Parker et al., 2016).

In contrast, the engineering design perspective views platforms as purposefully designed modular technological architecture (Gawer & Cusumano, 2002; Tiwana, 2013) to facilitate innovation. The gist of this perspective is that platforms have modular architecture comprising of a stable core and variable peripheral components to reduce the interdependencies. This modular architecture allows autonomous innovation between modules, which in turn enables easy modification by adding, switching, or removing features (Wheelwright & Clark, 1992; Gawer, 2014). In other words, the value of a platform depends on external agents to develop complementary innovations to extend the platform's native functions (Eisenmann et al., 2006, Parker & Van Alstyne, 2005). The platform owners determine the degree of openness of its interface between the core and the periphery. Boudreau (2010) finds empirical evidence proving that when a firm opens up and gives access for external parties to its resources, it can increase dramatically the innovation rate to a degree that is beyond any traditional organization capability (ibid). In short, the engineering design perspective argues that platforms create value by facilitating innovation at industry level (Schilling, 2000).

Gawer (2014) points out that while providing insights on competition dynamics between platforms, the economic perspective offers limited explanations on platform innovation. Similarly, while the engineering design is extremely useful to understand how platforms innovate, it does not offer explanations on how platforms compete. In reality, platform competition and platform innovation interact closely with each other and together they shape the development of platforms. Therefore, to have a comprehensive understanding of platform business and how it evolves, we need to combine both perspectives. Table 1 below provides a summary of platform definitions with their representative authors.



Table 1. Summary of platform definitions

Platform type	Definition	Re
<b>Internal-oriented platform</b>	The participants of internal platforms are the firms and its sub-units	Gr
- Organizational platform	Focuses on organizational and dynamic capabilities that enable firms to respond and adapt to external changes	Te
- Product family platform	Focuses on the technical architecture of the product or services to enable flexible and efficient product diversification	Si Si
<b>External-oriented platform</b>	Firm-external platforms focus on 2 aspects:	Pe
	- The facilitation of complementary prorducts/services by external agents	
	- interaction between two or more participant groups (supply-side and demand-side)	
- Supply-chain platform	Focuses on the interdependence between the assembler and its supplier	
- Industry platform	Focuses on providing a foundation for external players to participate in and develop complementary products to extend the platform's native functions	Pe
Market intermediary platform (economic perspective)	The platform acts as a facilitator to enable, connect and coordinate transactions between two or more distinct customer groups	Ar (2)
Technology-driven platform (engineering design perspective)	The platform acts as a technology-based innovation hub, in which a focal firm opens its technical interface and invites external agents to develop complementary products or services for the platform	Gr Gr (2)

### 2.1.2 Multi-sided platforms

The typical example of economic perspective is *market intermediary platform*, also called double-sided or multisided platform (MSP). An MSP acts as a facilitator to enable and coordinate transactions between two or more customer groups, and thus effectively aggregates supply and demand (Hagiu, 2006; Rochet & Tirole, 2006; Thomas et al., 2014; Hagiu & Wright, 2013). Gawer (2014) considers market intermediary platform as a special case of industry platform

Because MSP is essentially a type of intermediary, it is important to differentiate MSP from traditional market intermediaries by recognizing a firm's position along the continuum between pure MSP and pure reseller by understanding the strategic logic behind such position. According to Hagiu and Wright (2013), an intermediary firm can choose to be a pure reseller who purchases and then resells products or services, or a pure MSP who enables transactions without controlling or owning the offerings (Hagiu & Yoffie, 2009), or a hybrid of both. In other words, a firm's position along the continuum depends on how much control it has over transactions between sellers and buyers.

Figure 2 below illustrates the various categories on industry platform.

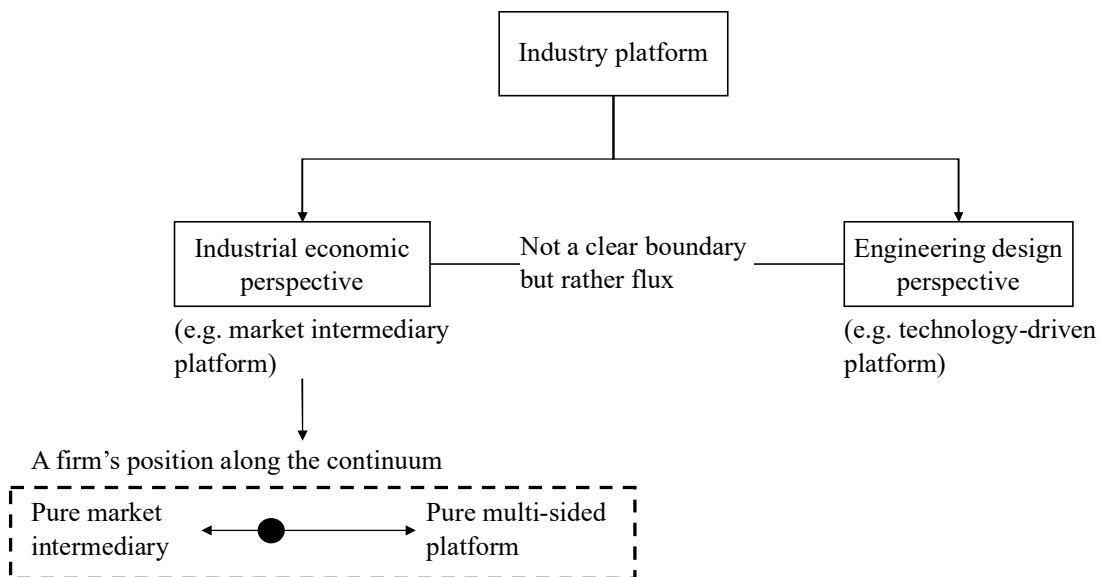


Figure 2. Categories of industry platform

While MSP emerges as a popular business model nowadays, mainly thanks to the success of Internet giants, such as Google, Amazon and eBay, Hagiu and Wright (2013) argue that MSP is not the answer for every business situation and in some cases, the reseller

model would yield better performance. To determine, four aspects should be examined: the potential to achieve scale, consideration of aggregation effects, experience of buyer and/or seller, and market failures. Specifically, reseller is a better model when there is a significant advantage in terms of economies of scale. For example, economies of scale play a more noticeable role with high-demand products than with low-demand/long-tail products. Secondly, reseller strategy is more suitable to bundle products and services that are complementary to each other and have a higher value when sold together as a package. Thirdly, a big retailer is in a better position to offer better buyer or seller experience, e.g. standardized product information and delivery service. Lastly, reseller is a better model to ensure reliable information about product quality, guarantee the credibility of sellers, and avoid asymmetrical power between sellers.

Overall, industry platform is considered the most complex type of platform. As a platform becomes more open, it generally enjoys an increasingly diverse source of innovation because more external actors will be attracted to join the ecosystem. However, a higher number of participants also means a more complex system, both in terms of structure and behaviors. Additionally, Gawer (2014) also noted that the dynamics between the platform provider and its complementors, while being collaborative, can also be simultaneously competitive. When a platform reaches this stage, how a platform owner manages and runs its ecosystem, without relying on managerial hierarchy or supply-chain authority, plays an essential role to balance this collaborative/competitive dynamic while ensuring complementors' incentives to innovate on the platform (Gawer, 2014). The following sub-chapter will discuss in details different mechanisms used by a platform owner to control and run its ecosystem.

## **2.2 Mechanisms to incentivize platform participation**

An industry platform is born when a platform owner opens its system and invites external agents to join in and contribute. A platform is, therefore, a complex system by nature. With an extended network of agents, a platform is by far one of the most complex systems beyond any existing traditional business organizations due to the interdependencies among actors and great variability in behaviors (Adner, 2012). To manage such complexity, a platform owner deploys two mechanisms: platform architecture to reduce structural complexity and platform governance to reduce behavior complexity. A review of these mechanisms helps to understand better what a platform can do to incentivize

external agents to participate in and contribute to its ecosystem.

### **2.2.1 Platform architecture**

One cannot fully comprehend what a platform ecosystem means without understanding at least the basics of platform architecture. The platform architecture has two functions: partitioning and integrating (Tiwana, 2013) and its goal is to balance between autonomy and coordination. Partitioning means to break down a complex platform ecosystem into its sub-systems. These sub-systems should be as independent of one another as possible, allowing autonomy in design and innovation (Baldwin & Clark, 2000). These sub-systems should then be integrated with the platform to deliver value to end-users. Such integration is done through a standardized interface, which allows the components of the platform interoperate seamlessly with minimal efforts for communication and coordination.

A platform owner needs to determine the degree of modularity of its architecture. Modularity refers to the extent to which the platform and its complementary components can be designed and modified independently from each other (Tiwana, 2013). The purpose of having a modular design is to minimize the interdependencies among the actors of the ecosystem so that each actor can evolve and make changes without causing ripple effects to the rest of the system. It allows rapid innovation and easy modification by adding, switching, or removing features (Wheelwright & Clark, 1992; Gawer, 2014). Modularity thus reduces dramatically the transaction and coordination costs that external actors bear every time they implement a new change, which translates into more frequent and faster innovation (Baldwin & Clark, 2000; Tiwana, 2013). Therefore, Tiwana (2013) argues that the architecture of a platform strongly influences the motivation of actors to participate in and innovate complementary products and services for a platform. Tiwana, Konsynski, and Bush (2010) also emphasize that the decision – where to position a platform architecture on a continuum between perfectly monolithic and perfectly modular – is irreversible and has strategic implications on the platform’s evolutionary trajectory in the future.

The advantages of modular architecture in platform design comes in three-fold. Firstly, it allows multiple firms to participate in the production and combine efforts to deliver values for end-users, rather than having one single integrated organization to do all the work. Choudary (2015) refers to this as the plug-and-play properties of a platform.

Secondly, new capabilities that are unanticipated by a platform's original designers can be readily added through the contributions of external actors in the future, illustrating the emergent properties of a platform ecosystem (Tiwana, 2013). Lastly, it allows external actors to focus on their expertise and hone their core competence because system integration is ensured thanks to compliance with the platform's interface specifications.

Modularization uses two mechanisms of decoupling and interface standardization to balance between secrecy and openness. The essence of decoupling is to decide which functions remain inside the platform – the core, and which ones are left for external developers – the periphery (Tiwana, 2013). It is suggested that functions that are highly reusable, generic, and stable should go into the platform so that all actors of the ecosystem can enjoy the internal functionality enhancement, whereas unproven and high-variety functions should be left to external developers to foster competition in finding winning solutions (ibid). A platform's visible information is available to external developers through standardized interfaces, which provide pre-defined rules and protocols that dictate how an external module communicates, interoperates, and exchanges data with the platform. Putting it another way, all interactions between a platform and its modules occur through these interfaces. To ensure platform-wide integration, it is required that the platform's interfaces are precisely documented, stable, and versatile (ibid).

To sum it up, a platform modularizes its ecosystem to enable autonomous development of external developers on a large scale while maintaining low transaction costs. Then it leverages standardized interfaces to enable system integration between external components and the platform while keeping coordination costs low. The next logical question is how to get external developers to comply with a platform's interface standards, especially with newly introduced ones. Platform governance, which we will discuss in the next sub-chapter, plays an important role in enforcing compliance with a platform's design rules.

### **2.2.2 Platform governance**

Platform governance is defined as mechanisms used to facilitate the activities of external agents participating in a platform's ecosystem. Unlike traditional business, platform owners do not have hierarchical authority to control external agents, rather they rely on governance mechanisms to orchestrate the behaviors of the platform participants. Similar to platform architecture, the goal of platform governance is to balance between autonomy

and coordination to ensure that independent innovation can be successfully integrated to the platform and deliver values to end-users (Rochet & Tirole, 2003; Boudreau, 2010; Tiwana, 2013).

Tiwana (2013) identifies three dimensions of platform governance: pricing policies, decision rights, and control mechanisms, which are agreed by many other researchers (Eisenmann et al., 2006; Hagiu, 2014; Gawer, 2014).

The first dimension, *pricing policies*, is the focus of many researchers because it is key to incentivize and encourage external agents to innovate and develop platform complements (Hagiu, 2006; Tiwana, 2013; Parker et al., 2016). Additionally, pricing policies directly influence the market competition which reflects through multi-home, which means the extent to which a user can participate in several competing platforms simultaneously, and lock-in effect, which occurs when switching costs are significant enough to discourage users to change from one platform to another (Rochet & Tirole, 2003; Porch et al., 2015).

Two main decisions regarding pricing policies are as follows. Firstly, a platform owner must decide whether they should charge money from both sides of a platform, or they should subsidize one side and make money with the other side. Rochet and Tirole (2003) suggest that the subsidized side should be the one whose number of participants has significant value to the other side. Secondly, platform owners must decide how to divvy the proceeds between external agents and the platform owner. The choice can be either a fixed scale, which is a percentage predetermined by platform owners, or a moving scale, which changes based on volume. In the context of software system, Tiwana (2013) suggests that the platform owner should decide to charge an access-based fee or usage-based fee, whereas app developers decide on the pricing scheme for their apps, such as one-time payment, subscription payment, or usage-based payment. Pricing decisions should align with the platform's lifecycle stage and its business model.

Studies have proven that pricing alone is not sufficient to regulate platform ecosystem (Gaware & Cusumano, 2002). Instead, platform owners rely on nuanced combinations of various non-price levers, including legal, cooperative, technological, informational, administrative, and other instruments, to encourage and regulate interactions among external agents. While Boudreau and Hagiu (2008) refer to these instruments as boundary

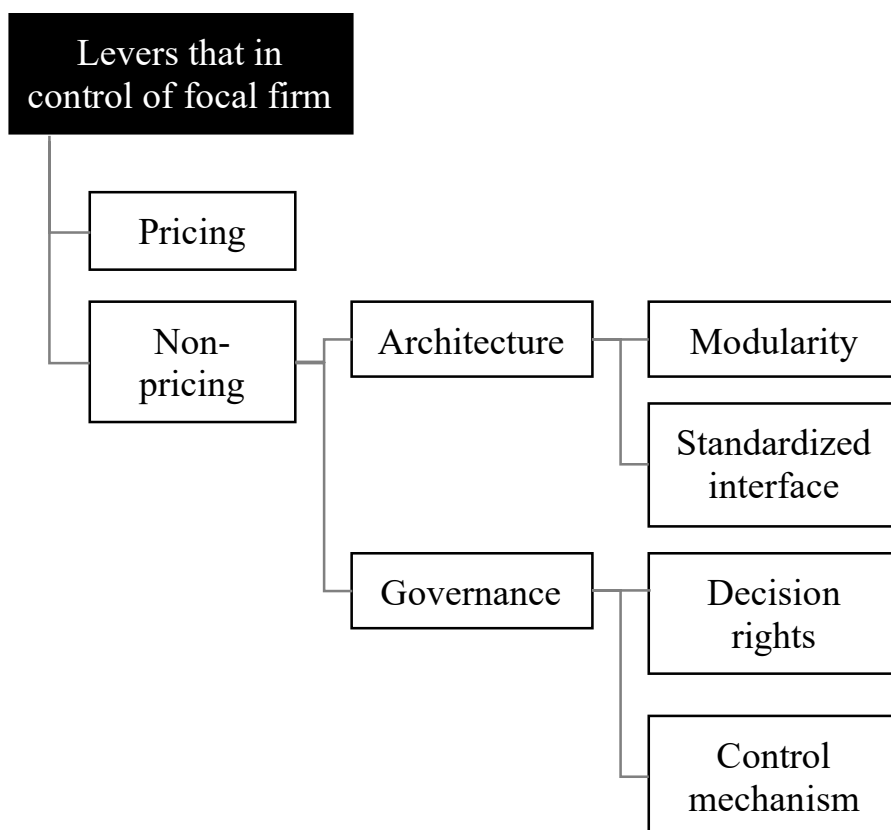
resources, Tiwana (2013) call them decision right and control mechanisms, two out of three dimensions of platform governance.

*Decision right* essentially means who makes what decision and it determines the extent of autonomy of a platform. It can be anywhere along the continuum between centralization, meaning the platform owner has the authority to make decisions, and decentralization, meaning the external agents have the authority to make decisions. There are two broad groups of decisions to be made: strategic and implementation. While strategic decisions determine the development direction of the platform, implementation decisions decide on platform details, such as features, functionality, design, and user interface. It is emphasized that decision right allocation should reflect the architecture of a platform (Baldwin & Clark, 2000), meaning that a platform with modular architecture should also have a modular division of decision rights between the platform owner and external agents, whereas a platform with monolithic architecture should have centralized decision-making process. Tiwana (2013) notes that for certain types of decisions, both platform owners and external agents should provide inputs to complement each other's strengths and core knowledge.

Finally, *control mechanisms*, are tools used to ensure alignment between independent work of external agents and the platform ecosystem's best interests. Control mechanisms implement and enforce the platform's rules by encouraging desirable behaviors and punishing undesirable ones. Tiwana (2013) suggested that a platform's control portfolio is a combination of four independent mechanisms: *gatekeeping*, *process*, *metrics*, and *relational*. While the first three mechanisms – gatekeeping, process, and metrics – are a formal form of control, the last one – relational – is informal control. Firstly, *gatekeeping control* refers to pre-defined criteria imposed by the platform owner to determine who can participate in its ecosystem. Secondly, *process control* refers to the extent to which the platform owner rewards external agents who comply with the platform's processes and punishes those who do not comply. Thirdly, *metrics* refer to the degree to which the platform owner rewards or punishes external agents based on their performance. However, metrics-based control is rarely used in platform context because market competition is a powerful mechanism to determine winners and losers. Lastly, *relational control* refers to norms, values, and culture set by a platform owner to influence behaviors of external agents and align their work with the goals of the platform owner. Relational control is hardly sufficient by itself because it takes time to develop and requires a stable pool of

external agents. However, it is an inexpensive mechanism that complements nicely the other formal control forms. Choudary (2015) adds the fifth type – interaction control which is used to regulate the quantity and quality of interactions among platform participants, interactions that determine how strong and sustainable network effects a platform can generate.

Overall, levers used by a platform owner to ensure the success of its ecosystem can be divided into pricing and non-pricing ones. The reason for this categorization is due to a significant number of studies on the effects of pricing on platform participation. Non-pricing mechanisms can be further divided into architecture, which includes modularity and standardized interface, and governance, which includes decision rights and control mechanisms (figure 3). Table 2 provides a summary of these levers and their representative authors.



*Figure 3. Levers to incentivize platform participation*



Table 2. Summary of levers used to incentivize platform participation

Levers		Description	Representative literature	
Architecture	Modularity	- Increase autonomy - Reduce transaction costs	Parker & Van Alstyne (2010), Cusumano (2003)	
	Standardized interfaces	- Reduce integration costs	Tiwana et al. (2007), Gawer & Henderson (2007)	
Governance	Decision right	Decision rights can place anywhere on the continuum between centralization and decentralization. There are two types of decisions: strategic and implementation	Tiwana et al. (2007), Parker et al. (2009)	
	Control mechanism	Gatekeeping	Gatekeeping control are pre-defined criteria to determine who and what can participate to a platform ecosystem	Tiwana et al. (2007), Hagiu (2006)
		Process control	Process control is to ensure compliance with platform's rules	Tiwana et al. (2007), Parker et al. (2009)
		Metric-based control	Metric-based control is to measure the outcomes, but rarely used in platform context. Market competition is a more powerful alternative	Tiwana et al. (2007), Parker et al. (2009)
		Relational control	Relational control are norms, values and cultures that influence behaviors of external agents	Tiwana et al. (2007), Parker et al. (2009)
		Interaction controls	Interaction controls regulate the quality and quantity of interactions happening on a platform which determine the strength of network effect	Hagiu (2006)
	Pricing policies	Pricing is the key incentive to encourage external agents to participate to a platform ecosystem	Tiwana et al. (2006), Tiwana (2006), Parker et al. (2009)	

## **2.3 Motivation for platform participation**

A platform depends on its external complementors to generate value (Eisenmann et al., 2006, Parker & Van Alstyne, 2005). Therefore, it is a consensus among researchers that motivating external players to participate in and contribute to a platform is crucial to its success (Tiwana, 2013; Koch & Kerschbaum, 2014). However, few studies focus specifically on what motivates players to join a platform and especially what a platform owner can do to influence such motivations (Battistella & Nonino, 2012).

Ryan and Deci (2000) define a motivated person as someone who is energized to work to achieve a goal. My objective in this section is not to perform a meta-analysis of the literature on motivation theories. Rather the goal is to identify frameworks that can potentially apply to platform business context. My reviews particularly focus on studies that explain the motivations of independent participants who can choose, control, and manage their actions. The following section summarizes key findings in the motivation literature in both platform business and open innovation context.

### **2.3.1 Motivation in platform business literature**

Studies that look into motivations of external complementors in platform business context often emphasize economic-driven motivations. In his study on technological platforms, Tiwana (2013) states that app developers join a platform due to two main reasons: the advantage of scale and market access. App developers achieve economies of scale because they can leverage a base of common functionalities provided by the platform owner. As a result, they can focus on building unique features that differentiate them in the market. Additionally, a platform provides access to an existing sizable market that would have been otherwise inaccessible and/or too costly for small developers to acquire on their own (Van Alstyne et al, 2016). In other words, the motivations to join a platform is increasing demand and reduced search and transaction costs (Gawer & Cusumano, 2014).

In contrast, in their study on motivations of third-party developers in the context of the smartphone operating system (OS) ecosystem, Koch and Kerschbaum (2014) have found that there is a sizable group of developers who are intrinsically driven by factors such as fun and intellectual stimulation. Developers also attach more importance to improving skills and developing unavailable solutions than to gaining financial rewards. Boudreau and Jeppesen (2015) confirm that even without sales incentives, external complementors still contribute to

platform development because they have multiple sources of motivations, most of which are not related to platform scale and growth except for signaling and reputational motivations. Koch and Kerschbaum (2014) also show that comparing to intrinsically motivated developers, extrinsically motivated ones consider the market size to be significant because it indicates potential financial gains. Furthermore, they prefer platforms with tight integration due to easier targeting and less resource expenditure. Additionally, empirical evidence proves that the process of using a toolkit to build solutions gives personal enjoyment and pride to developers. Therefore, developers perceive the quality of toolkit, such as software development kit (SDK) provided by the platform owner, as an important factor in choosing which platform ecosystem to join.

Overall, the platform literature points out that external developers' decisions to join a platform are driven scale advantage, market access, and toolkit quality.

### **2.3.2 Motivation in Open Source Software literature**

Since the literature on platform business offers limited insights into what motivates external players to join a platform, I extended my review to the literature on open innovation. The field of open source software (OSS) has been studied extensively to identify a wide range of motivations why external innovators engage with open source projects (Belezon & Schankermann, 2008). The main difference between OSS and platform business is that most external developers in OSS volunteer their time and efforts. Understanding this willingness to work for free has been the key focus of many OSS research (Battistella & Nonino, 2012).

While OSS does not share the same characteristics with platform business, both OSS and platforms enable open and collection innovation among multiple stakeholders (Adner & Kapoor, 2010), who are external parties and cannot be managed by traditional employment contracts or organizational hierarchy (Roberts, Hann & Slaughter, 2006). Additionally, even though OSS projects do not present clear profit incentives like platform business, results from the empirical study of Koch and Kerschbaum (2014) show that there are multiple sources of motivations besides financial gains. Therefore, I would argue that the rich insights from OSS literature can be conceptualized to advance our understanding of external complementors' motivations in platform business. The degree of appropriability will be reviewed through the empirical results of my study.

a. *The classic Self-Determination framework*

While there is no consensus among OSS scholars as to which motivation plays the key role, past research has proven again and again that the motivations of external developers to participate in open innovation are incredibly heterogeneous (Boudreau & Lakhani, 2009). In contrast to the belief that extrinsic motivation drives contribution (Lerner & Tirole, 2002), empirical studies have found evidence proving that potential profit is not the only reason to participate in OSS (Lakhani & Wolf, 2003; Roberts et al., 2006). Developers can be motivated by either self-interest reasons, for example, seeking career advancement (Lerner & Tirole, 2002; Lakhani & Wolf, 2003) or they can be appealed by the ideology of OSS community and feel conformed to reciprocate to the community that values knowledge sharing (Hertel, Niedner, & Herrmann, 2003; Lakhani & von Hippel, 2003). Other motivations often quoted in literature review include learning and skill improvement (Benbya & Belbaly, 2010), enjoyment (Lakhani & Wolf, 2003), personal need for software solutions (Roberts et al., 2006), a sense of belonging to the community (Lakhani & Wolf, 2003) and reputation (Roberts et al., 2006; Boudreau & Lakhani, 2009).

To categorize the variety of motivations mentioned above, many researchers have relied on the classic self-determination theory (SDT) with its extrinsic/intrinsic dichotomy because it is by far the most frequently used framework (von Krogh, Haefliger, Spaeth & Wallin, 2012; Koch & Kerschbaum, 2014). Deci and Ryan (1985) distinguish *intrinsic motivation* as the drive to do something in the absence of external rewards because the reward is in the activity itself. In contrast, *extrinsic motivation* refers to doing an activity for its instrumental value to gain a separate outcome (Ryan & Deci, 2000).

Based on the basic distinction between extrinsic and intrinsic, many scholars attempt to further divide the motivations into sub-categories. For instance, Lakhani and Wolf (2003) report that **intrinsic motivation** can be sub-divided into 1) *enjoyment-based intrinsic motivation* in the form of a sense of creativity or intellectual stimulation, and 2) *obligation/community-based intrinsic motivation*. Similarly, **extrinsic motivations** can be divided into 1) *immediate payoffs* in the form of financial reward and personal use-value, and 2) *delayed payoffs* which include career advancement and skill development.

Similarly, Battistella and Nonino (2012) categorize **intrinsic motivations** into two dimensions: 1) *individual-driven motivation* such as entrepreneurial mindset (Tapscott & Williams, 2006)

and 2) *social-driven motivation* such as social responsibility (Benbya & Belbaly, 2010). Battistella and Nonino (2012) then divide **extrinsic motivations** into 3 dimensions: 1) *economic motivation* in the form of monetary rewards, free products and free services (Tapscott & Williams, 2006); 2) *professional motivation* such as reputation and career opportunities (Roberts et al., 2006); and 3) *social motivation* which includes a sense of individual accountability (Benbya & Belbaly, 2010). Based on the above-mentioned categories, one can argue that the two motivations identified by Tiwana (2013), scale advantage, and market access, can be considered as extrinsic motivation and specifically, economic type of extrinsic motivation.

Extending the classic SDT framework, Roberts et al. (2006) propose a third category called *internalized extrinsic motivation* to refer to motivations that are by definition extrinsic but are self-regulated rather than being imposed by external forces, for example, reputation and learning (Boudreau & Lakhani, 2009; von Krogh et al., 2012). After reviewing 40 different studies on individual motivation to engage with OSS development, Von Krogh et al. (2012) propose 10 motivational groups under the 3 main categories. *Intrinsic motivations* include ideology, altruism, kinship, and fun. *Internalized extrinsic motivations* include reputation, reciprocity, learning, and own-use. *Extrinsic motivations* include career and pay.

#### *b. Alternative frameworks*

Some scholars propose alternative frameworks. However, they tend to be somewhat related to Ryan and Deci's original extrinsic/intrinsic dichotomy. For example, according to Bonaccorsi and Rossi (2006), motivations can be categorized into three groups: 1) *economic motivation* such as monetary rewards (Hertel et al., 2003) and competence signal to potential employers (Lerner & Tirole, 2002); 2) *social motivation* such as gift culture of OSS community and 3) *technological motivation* such as learning opportunity to improve programming skills (Lakhani & von Hippel, 2003). Economic motivation is closely related to extrinsic motivation, whereas social motivation generally matches to intrinsic motivation.

Unlike other scholars, Bonaccorsi and Rossi (2006) also provide insights into the motivations of firms to contribute to OSS. Because the goals of individuals and firms in participating in OSS differ, their incentives only overlap partly. In particular, while social motivations are the typical reasons for individual developers to engage with OSS development, economic and technological motivations play much more important roles in a firm's decision to participate.

Potential profit is the main reason that drives firms' decisions because they can generate indirect revenue by selling related products and lower innovation costs by taking advantage of R&D spillover (Bonaccorsi & Rossi, 2006). Firms also emphasize the importance of receiving feedback and contribution from the OS community, based on which they test and improve product quality, which in turn lower their innovation costs (Lerner & Tirole, 2002). In contrast, firms only share code and knowledge to comply with the norms of the OSS community and to sustain the trust and cooperation of individual developers.

Attempts to go beyond self-determination theory can be found in Benbya and Belbaly (2010). They argue that the wide range of motivations identified by researchers can generally be explained by two theories. The first one is a traditional economic theory that explains self-interested behavior when developers pursue outcomes that are beneficial for their future, such as skill improvement and job opportunities. The second one is social movement theory related to gift economies to explain selfless behavior when developers contribute to the greater good of the communities, such as reciprocity and ideology. Benbya and Belbaly (2010) believe that the SDT framework alone is insufficient to explain the mixed findings of motivations in OSS development. For example, Lakhani and Wolf (2003) have proved that intrinsic motivations in the form of enjoyment and fun are the main driver of participation, whereas Roberts et al. (2006) have found no evidence that could prove the significant influence of intrinsic motivations on the contribution of developers. Therefore, Benbya and Belbaly (2010) propose a multi-theoretical framework which includes three theories: goal-orientation, expectancy, and social exchange. Based on that framework, their study reveals that the setting of open innovation projects enables an overlap among economic, social, and psychological motives. In particular, learning goals in terms of skill and competence improvement, professional expectations in terms of career advancement, reciprocity, and ideology are the primary drivers of developers to engage with OSS projects.

After reviewing various studies, I conclude that while each scholar has his framework with different category names, there is quite a significant overlap among them in terms of individual motivation. Table 3 presents a short description of each motivation types together with their representative authors, while Figure 4 demonstrates my synthesizing version of findings from motivation research.

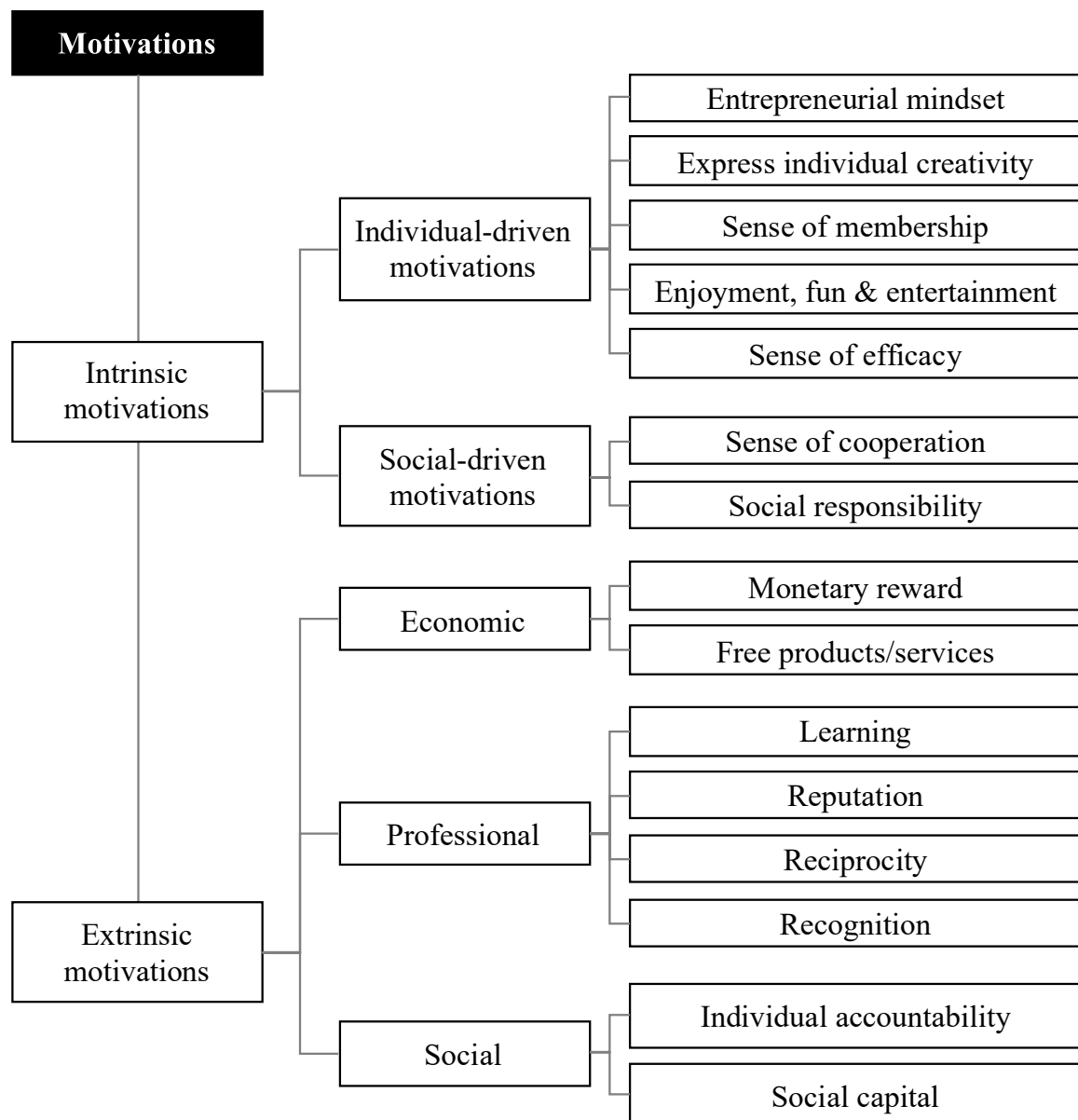


Figure 4. Motivation types (adapted from Battistella & Nonino, 2012)

Table 3. Summary of motivation types

Perspective	Motivation types	Sub-types	Description	Main authors
Platform-oriented	Scale advantage		External agents can leverage the foundation of common functionalities provided by platform owners to build their own complementary products and	Tiwana
	Market access		External agents can access existing markets that would have been inaccessible otherwise, which in return reduces search and transaction costs for external agents	Tiwana
Extended Self-Determine Theory	Intrinsic	Individual	Entrepreneurial mindset	Tapsco Battiste
			Opportunity to express individual creativity	Ryan & Nonino
			Sense of membership	Lakhan Nonino
			Enjoyment, fun and entertainment	Lakhan Nonino
			Sense of efficacy	Bandur (2012)
		Social	Sense of cooperation	Antikai Nonino
			Social responsibility	Benbya & Noni



Table 3 (cont.). Summary of motivation types

Perspective	Motivation types	Sub-types	Description	Main authors
Extended Self-Determine Theory	Extrinsic	Economic	Monetary rewards	Antikainen & Nonino (2013)
			Free products (hardware or software)	Tapscoff & Battiste (2013)
			Free services	Tapscoff (2013)
		Professional	Learning	Benbya & Nonino (2013)
			Reputation	Battiste (2013)
			Reciprocity	Benbya & Nonino (2013)
			Recognition	Benbya & Nonino (2013)
		Social	Individual accountability	Antikainen & Belbaly (2012)
			Social capital	Battiste (2013)

### 2.3.3 Drivers that facilitate motivation

While it is interesting to know different types of motivation, I would argue that it is even more important to identify social and environmental drivers that facilitate and undermine motivation. Researchers agree that intrinsic motivations drive better performance (Ryan & Grolnick, 1986). The question is how to motivate participants when the activities that are not intrinsically interesting. This question is particularly relevant for a business context, as Boudreau & Lakhani (2009) point out, extrinsic motivations are more dominant in competitive markets while intrinsic motivations are more central in collaborative communities.

Deci and Ryan (1985) answer the above question by arguing that instead of perceiving motivation as an intrinsic/extrinsic dichotomy, it would be better to think of it as a continuum. There are two reasons why. The first reason is that intrinsic and extrinsic motivations are not mutually exclusive. Studies have shown that the presence of extrinsic motivations does not affect negatively intrinsic ones (Lakhani & Wolf, 2003). Additionally, in the case of Open Source Software development, researchers agree that there is no single dominant motivation that can explain why external developers contribute. Instead, they are motivated by a combination of intrinsic and extrinsic factors (Roberts et al., 2006). The second reason is that there are various degrees of extrinsic motivation. The continuum ranges from reluctance to passive submission, to active commitment. This process is called internalization and integration of external values to be internally associated with one's sense of self (Ryan & Deci, 2000). Higher internalization degrees drive greater perseverance, better engagement, and ultimately improved performance. Ryan and Deci (2000) conclude that four key drivers are particularly relevant to the process of internalizing motivation: expected tangible rewards, sense of autonomy, sense of competence, and relatedness.

Firstly, every type of *tangible reward* increases extrinsic motivation, however, it undermines intrinsic one. Researchers posit that incentives shift the focus from internal to external, and thus extrinsic motivations replace intrinsic ones (Roberts et al., 2006). Indeed, several studies have proven that in the presence of money, award, and prizes, or threats and punishments, subjects show fewer characteristics of intrinsic motivation (Deci, 1971; Harackiewicz, 1979).

Secondly, *a sense of competence* (self-efficacy) positively impacts both intrinsic and extrinsic motivation, and lead to greater engagement and better performance. In Cognitive Evaluation Theory, Deci and Ryan (1985) argue that rewards, constructive feedback, and communications

can enhance internalizing motivation because they satisfy the fundamental psychological need to feel capable and effective (Deci, 1971). It means that when one's perceptions of competence are undermined, intrinsic motivation decreases, and conversely, when one's perceptions of competence are boosted, intrinsic motivation increases (Ryan, 1982). A simple example is that students, who understand the subject and have relevant skills, are more likely to internalize a goal.

Besides a sense of competence, *a sense of autonomy* (self-determined actions) is required to enhance intrinsic and extrinsic motivation (Ryan, 1982). A sense of autonomy refers to a feeling when people have a chance for self-direction and decide themselves to do something. Experiments in classroom learning have proven that in an autonomy-supportive environment, students are more curious, are more ready for challenging tasks, and overall perform better (Ryan & Grolnick, 1986). Furthermore, researchers also suggest that both needs for competence and autonomy should be fulfilled to enhance motivation (Ryan & Deci, 2000).

Lastly, *a sense of relatedness* facilitates extrinsic motivation but there is no mentioned effect on intrinsic motivation (Ryan & Deci, 2000). The feeling when individuals feel connected to a group or belong to a peer group or a society provides the foundation for enabling internalized motivations.

These relationships are illustrated in figure 5 below.

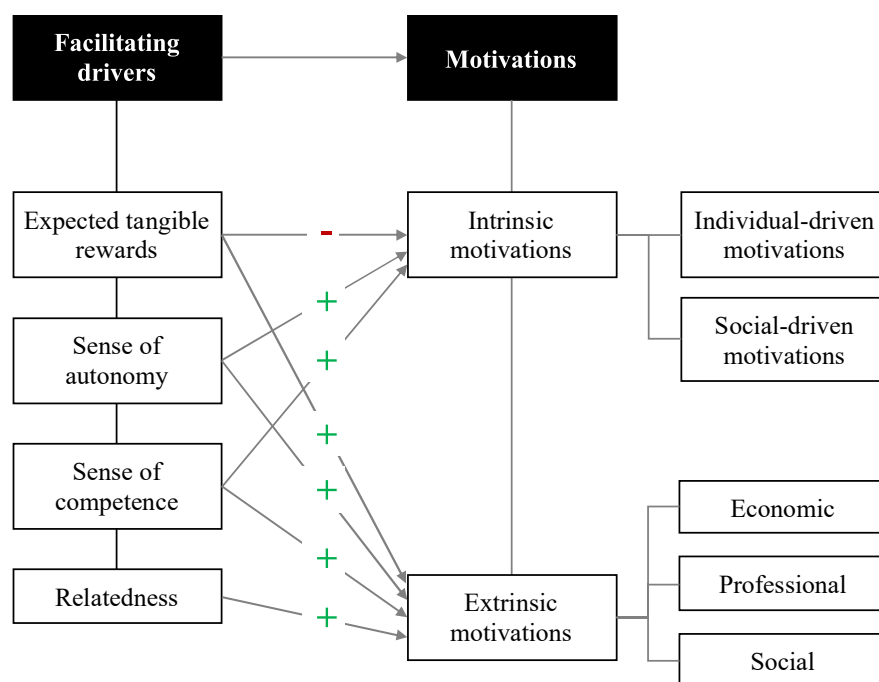


Figure 5. Drivers that facilitate or undermine motivations

## 2.4 Theoretical framework

My thesis objective is to understand the factors that a platform owner can leverage to encourage different transport service providers to participate in and contribute to a mobility-as-a-service ecosystem. In this section, the key findings of the literature review are presented, based on which a theoretical framework is developed to further analyze my empirical results.

The key challenge of any platform, especially a newly launched one, is to attract participants simultaneously because one side of the platform will not join without the presence of the other side. Researchers refer to this challenge as the chick-and-egg problem (Parker et al, 2016). Platform literature has focused on mechanisms that the platform owner can deploy to attract participants (Tiwana, 2013). Main levers are pricing mechanisms, architecture decisions of the platform as well as governance mechanisms which include decision rights and control. This is the first part of my theoretical framework, demonstrated by the blue boxes in figure 6 below. The second part of my theoretical framework consists of different types of motivations which are based on the Self-Determination Theory from Deci and Ryan (1985) and the drivers that facilitate or undermine them (Ryan & Deci, 2000). The extended version of intrinsic and extrinsic motivation is provided by Battistella and Nonino (2012) based on their review of recent literature on motivations in the context of open and collective innovation.

In essence, if motivations are defined as the underlying reasons why someone does something, then motivational drivers are elements that influence people's motivations. In platform context, motivational drivers are the designs of the platform (architecture) and managerial mechanisms used to control the platform (governance) (Battistella & Nonino, 2012). While exploring different platform architecture and governance mechanisms, researchers mention how they can potentially influence external agents' motivations to justify the important role of each element (Tiwana, 2013). However, it lacks an explicit connection between the two domains of platform and motivation theories. Therefore, answers to the question – “How can a platform be designed and governed to drive motivations of external complementors?” – remain incomplete. My research aims to further explore the gap between these two theoretical domains, illustrated by the red dashes arrows in figure 6 below.

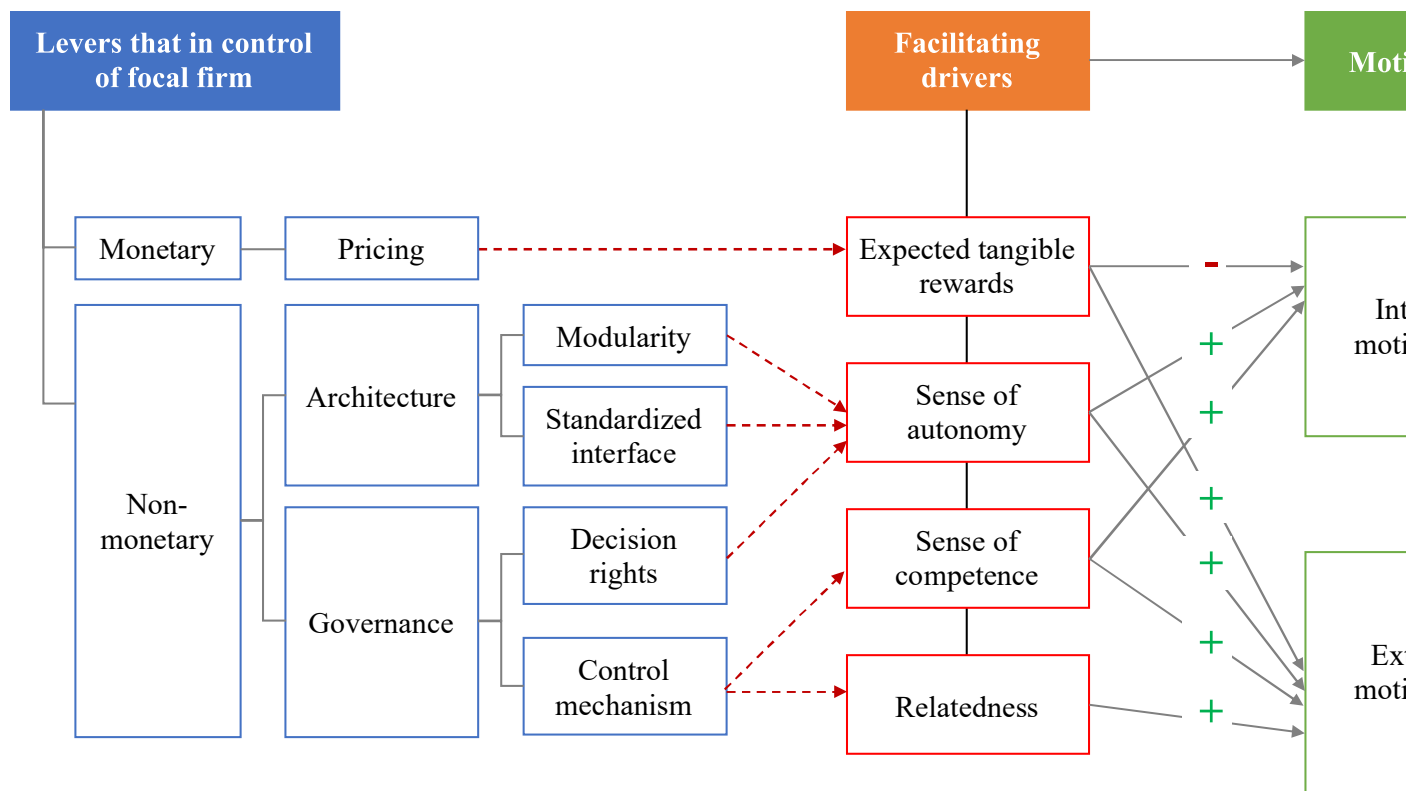


Figure 6. Theoretical framework

### **3 METHODOLOGY**

This chapter reviews the methodology of my research. Firstly, I introduce and explain the research approach, which is then followed by a discussion about research methods, including data collection and data analysis. The chapter concludes with an evaluation of the research from the quality and ethical points of view

#### **3.1 Research approach**

According to Eriksson and Kovalainen (2008), research philosophy guides the research strategy and chosen methods. Therefore, I will first explain the philosophical assumptions to understand why I chose to conduct my study with certain methods. In this case, the philosophical position I adopted is best described as critical realism. Critical realists argue that to explain a phenomenon we need to understand the social structures and actors involved because our knowledge of reality is a product of social conditioning (Saunders, Lewis & Thornhill, 2009). The aim is to explain and answer what caused certain events to happen – or in other words, to understand and describe the world as truthfully as possible (Easton, 2010). Therefore, researchers who adopt a critical realism position encourage alternative, even competing, explanations as well as using various theoretical lenses to interpret data (Woodside & Wilson, 2003). Easton (2010) even suggests that critical realism is specifically fit to understand complex phenomena such as a network of connected organizations. Thus, it is a suitable philosophy for this study because MaaS is an emerging social phenomenon and a platform that connects various stakeholders.

Following the research philosophy, the study is conducted by using an induction research approach. Because Mobility-as-a-Service is a relatively new concept with limited prior research, my study aims to expand existing theories and potentially generate new ones. For that purpose, an inductive approach is said to be more suitable than a deductive one. Firstly, an inductive approach allows new theory and concepts to be developed based on empirical data. Moreover, it is applicable when the study is qualitative and it requires flexibility to permit alternative interpretations and allow researchers to closely examine the phenomenon and its social context (Saunders et al., 2009).

Next, case study research method is chosen to address the research questions because the complex nature of the topic makes it challenging to deploy quantitative methods (Easton 2010).

Eisenhardt (1989) also considers case study approach appropriate for new topic areas, where little empirical study and prior research exists, because it enables researchers to build new theories that are novel and testable. Additionally, this study satisfies the three conditions proposed by Yin (2003) to justify a case study approach. Firstly, my research question focuses on the explanatory aspect of the research problem, asking the question “what” and “how” to reveal why transport service providers join a MaaS ecosystem and how a MaaS operator can influence it. Secondly, Yin (2003) highlights that case study research permits the context of the phenomenon to be explored, a factor that I deem important because the MaaS ecosystem is still evolving and it is conditioned by numerous uncertain factors of its environmental context. Dubbois and Gadde (2002) also agree that a contemporary phenomenon needs to be studied in its real-life context through an in-depth case study. Lastly, case study method is valid when researchers cannot manipulate the behaviors of involved stakeholders (Yin, 2003).

The case study in this thesis is an intensive embedded single case study (Yin 2003). It is intensive because the aim is to produce a holistic and rich description of a single case – the MaaS ecosystem in the Helsinki capital region (Eriksson & Kovalainen, 2008). It is an embedded single case study because within the broad context of Mobility-as-a-Service, the focal unit of analysis is the MaaS platform. Additionally, the study also involves several embedded units of analysis which are service providers who provide mobility solutions for the platform. The purpose is to understand the MaaS concept from multiple angles and thus strengthen and expand the insights about the case (Yin, 2003).

As mentioned above, the unit of analysis of this study is a MaaS platform. In their 2016 study, Kamargianni et al. (2016) identified fifteen MaaS systems around the world. According to their integration index that measures the integration level of the MaaS systems based on four dimensions: ticket, payment, information, and communication technology (ICT) and mobility package, the Whim app operated by MaaS Global Oy in Helsinki Finland ranked the highest. However, I would like to emphasize the MaaS concept is in its initial phase of the hype cycle. It is a cycle that all new technology has to go through when being introduced to the market (Gartner Research, 2003). The cycle starts when a new product/service gains increasing attention and visibility, then it reaches its peak, which is then followed by a drop before entering the so-called “slope of enlightenment” to finally get to a stable stage. In other words, the MaaS concept has a long way to go before it matures, presenting a wide variety of topics to learn more about this innovative phenomenon (Kamargianni & Matyas, 2017).

Kamargianni and Matyas (2017) refer to the MaaS phenomenon as an ecosystem and they are rightfully so. MaaS consists of four pillars and four major actor groups. All those elements are interactive and interdependent to one another and their alignment is crucial to the success of MaaS. The four pillars are business models, technology, end-user, and policy framework. The four actor groups include political actors who specify regulations and policies to enable the MaaS market, the mobility service providers (MSPs) who provide the actual physical transport, end-users, and the MaaS operator, who is the new actor responsible for integrating multimodal transport modes and providing mobility packages to customers through a unified interface. The MaaS ecosystem framework is illustrated in Figure 7 below.

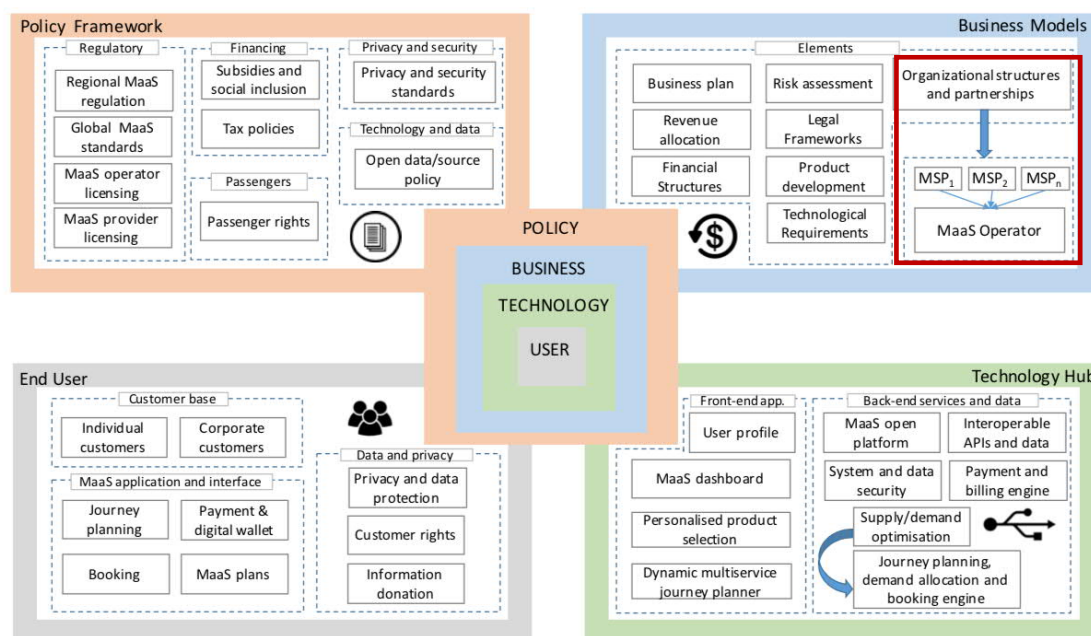


Figure 7. MaaS ecosystem framework (Kamargianni & Matyas, 2017)

As depicted in the above figure, MaaS concept is broad and it is not realistic to cover all in the limit of a Master's thesis. In terms of pillars, my research studies the business side of MaaS ecosystem because it is the most relevant to my academic background. In terms of actor groups, my focus is on the partnership between the service providers and MaaS operator. This partnership determines the value that a MaaS ecosystem offers to end-users and therefore, it determines the success of the whole concept (ibid). I decided not to include political actors because they play a more passive role in the ecosystem. I also do not include end-users because understanding the demand side has been the main emphasis of previous studies (Atkins, 2015), leaving the supply side relatively under-researched. The basic assumption here is that the more transport service providers engage with a MaaS operator, the more attractive MaaS offerings



become to consumers.

I choose MaaS Global Oy (Whim app) as the case company because 1) it demonstrates the highest integration level of a MaaS ecosystem and 2) Whim app entered its commercialized phase at the end of 2017. The fact that it is not a pilot but is run like a business is a great advantage because empirical research is also based on what is happening instead of hypothetical discussions. The sub-units of analysis are transport service providers who already join the ecosystem and who have not joined but potentially could in the future. Overall, I would argue that choosing MaaS Global Oy as the focal firm provides positive contributions to a better understanding of MaaS concept in particular, and platform business in general.

### **3.2 Data collection**

I used mainly semi-structured interviews to collect empirical data. Eriksson and Kovalainen (2008) argue that semi-structured interviews are suitable to explore “what” and “how” research question types. Saunders et al. (2009) indeed agree that semi-structured interviews would be a great choice for exploratory study. Because the concept Mobility-as-a-service is relatively new, each interviewee could have his or her own understanding and interpretation. Therefore, a pre-prepared list of interview questions was needed to ensure that the themes and topics discussed in each interview were relevant and consistent. At the same time, semi-structured interviews gave me the flexibility to skip some questions, ask additional exploratory and targeted questions or change the question order, all of which were necessary to ensure natural conversation flow (ibid).

The interview guide for platform participants was developed based on the literature review and the guidance of my thesis supervisor. The main purpose was to ensure that all relevant topics would be covered and that there would be no biases or leading questions. I intentionally kept the questions broad and open ended in order to obtain as much information as possible. The interview guide consists of three main themes: 1) Introduction and background information, 2) View on Mobility-as-a-Service concept, and 3) Motivations to join a MaaS platform. It is also worth noting that my data collection approach was flexible, meaning that I started to review and analyze the interview results during data collection phase. It allowed me to adjust the interview questions to be more suitable to the context. For instance, when I realized that MaaS Global was not a full-fledged platform with distinctive tools and features, I removed questions that asked specifically about platform design and instead, added questions about generic

motivational factors. Additionally, while the three themes remain the same, the question wordings were adapted depending on whether the interviewees were a part of MaaS ecosystem or not. Lastly, a separate set of questions were formed to interview the CEO of MaaS Global because the objective was to understand the MaaS business model from the perspective of the platform owner. The interview guide can be found in Appendix 1.

In total I conducted ten semi-structured interviews between March – August 2018, of which one interview was with the founder of MaaS Global, Sampo Hietanen, and the other nine interviews were with representatives from transport service providers. At the time the interviews were conducted, six transport service providers already partnered with Whim and three of them had not. I first approached Sampo Hietanen in the beginning of 2018 to express my interest in writing my Master's thesis for MaaS Global. Mr. Hietanen then put me in touch with the Head of Partnering, who then helped me to recruit the first six interviewees through their existing partner network. The main selection criteria were that the interviewees were from organizations that offer mobility services and should have knowledge and experience with MaaS or new mobility solutions in general. Furthermore, I interviewed two additional transport service providers, who decided not to join the platform when MaaS Global reached out to them. My main argument was that the perspective of the service providers who did not join the platform were equally important to that of those who did. Being able to understand both sides would allow me to avoid bias and gain holistic insights into the case. Lastly, based on the findings of the previous interviews, I reached out to one last service provider, who could be considered as relevant for the future development of MaaS Global, even though his company did not provide transport solution for passengers. Table 4 below shows the complete list of interviewees.

*Table 4. Meta-data on interviews*

<b>N</b>	<b>Organization</b>	<b>Participant</b>	<b>Code</b>
1	MaaS Global (Whim)	Sampo Hietanen, CEO	MaaS operator
2	Automotive company	Head of Mobility	Partner 1
3	Automotive company	MaaS Cooperation coordinator	Partner 2
4	Public transport service	Director, Customer experience and sales	Partner 3
5	Traditional transport provider	Director New Business	Partner 4
6	Traditional transport provider	Head of Business Development and IT	Partner 5

7	Traditional transport provider	Production Manager	Partner 6
8	Traditional transport provider	Business Owner	Non-partner 1
9	App-based mobility service	Program Director, Mobility Services	Non-partner 2
10	App-based food delivery	Co-founder, Head of Internal Development	Non-partner 3

The interview duration was between 30 to 60 minutes. For the purpose of transcribing and data analysis, all interviews were recorded with my mobile device and I informed the participants at the beginning of each interview to gain their permission. Additionally, I ensured the interviewees that their discussions would be kept anonymous and no direct quote would be linked to their names or their organizations. In terms of location, I conducted seven interviews face-to-face at either the interviewees' offices or at a public café. The other three interviews were done via phone due to the availability and preference of the participants. In terms of language, all interviews were conducted in English because it was our only common language. Some interviewees were more comfortable with English than the others but overall everyone was used to working and communicating in English. To minimize potential misunderstandings caused by language barriers, I paraphrased the interviewees and always concluded the interviews with a short summary to make sure that their ideas were understood and captured correctly. This approach allowed me to skip the translation step in data analysis stage and avoid any loss of meaning, thus, improving the overall quality of data interpretation.

### 3.3 Data analysis

Aiming to interpret the meaning of empirical evidence, my data analysis process follows the typical steps of qualitative content analysis, which are transcribing, within-interview analysis, cross-interview analysis and synthesizing. *The first step* was to transcribe the recorded audio to written words, which was done right after each interview. This step allows me to analyze the data more systematically and precisely instead of relying on memory (Rubin & Rubin, 2012).

*The second step* was to study each interview individually to gain a deeper understanding and identify unique perspectives of each participant (Eisenhardt, 1989). Notable quotations were highlighted, and my initial impressions of the findings were remarked to be examined further. To capture key concepts, I used primarily conventional content analysis approach to allow categories and themes to emerge naturally from the data without imposing pre-defined

categories. This approach is particularly suitable for a novel topic with limited existing theory like MaaS. What's more, with this approach, we could be confident that the generated insights and knowledge are tightly connected to the actual data (Hsieh & Shannon, 2005). After reviewing each interview, I added a short summary with key points to make it easier to compare across interviews, which brings us to *the third step* – cross-interview analysis.

Eisenhardt (1989) emphasizes that cross-interview analysis is crucial to improve the accuracy and reliability of the generated theory. Indeed, by searching for similarities and differences across interviews, I was able to look at the data from multiple angles. Initial impressions were compared and challenged, which helped to avoid premature and biased conclusions. In this step, the main challenge was to structure and combine the categories identified in step two to bigger categories, a challenge that required a directed approach to content analysis. A directed approach enabled a more systematic process by using dimensions suggested by existing literature to guide the development of key categories and sub-categories (Hsieh & Shannon, 2005). Essentially, a combination of conventional and directed content analysis permitted new insights and concepts to emerge from empirical data while simultaneously validated and extended existing theoretical framework.

*The final step* is to synthesize the findings and arrive to conclusions. This step is a continuously iterative process of comparing theory and data. Some relationships between existing theory and data were confirmed, while others were challenged and revised. Both are critical to establish good theory. Supporting findings improve confidence in the validity of theory, while conflicting findings motivate the researcher to look for alternative explanations which sharpen and enrich theory (Eisenhardt, 1989).

### **3.4 Research evaluation**

To evaluate the quality of my research, I used three tests proposed by Yin (2009): construct validity, reliability and external validity. These tests are typically used to determine the quality of empirical social study and hence, they are valid for case study research. Construct validity refers to whether the measures used to study the topics are suitable. Reliability determines the degree of transparency in research conduct which enables the study to be repeated. External validity means the generalizability of the findings. Yin (2009) also proposes the fourth test –

internal validity, which means establishing a causal relationship between the conditions. However, since this is an exploratory study, this test is not applicable.

To improve *construct validity*, I based my study in existing and high-quality research. Not only I studied platform theory, I also explored motivation and open innovation literature. By using multiple theoretical lenses, I am confident that relevant and valid measures were used to study the research topic. To ensure *reliability*, all steps involved in conducting this study were properly documented, including detailed explanations of the research approach and analysis methods. It is worth noting, however, that if the study would be replicated in the future, the results might differ because the perspectives could be time- and context-specific.

The *external validity* of my research results could be argued to be rather good because most of the findings are confirmed by existing study. However, I acknowledge that the extent of generalizability is still somewhat limited due to two reasons. Firstly, this is a case study focusing on one organization and the interview sample is relatively small. Secondly, the case company itself possesses unique characteristics of a startup operating in a newly emerging market (Saunders et al., 2009). While this setting provides an opportunity to gain deep understanding and rich insights into the researched phenomenon, it is hard to conclude whether the results would be applicable for other organizations. Further research with more cases, for example, with a more established case company or in a different geographical market or in a different industry, are needed to test the results and improve their generalizability (Yin, 2009).

Finally, Saunders et al. (2009) define *ethics* as “*the appropriateness of your behavior in relation to the rights of those who become the subject of your work, or are affected by it*”. This means to treat other researchers and research participants respectfully. Specifically, I spent a great amount of effort to make sure that past research used in this study was quoted and cited properly. Additionally, recording the interviews was done with the consent of the interviewees. Summary of key points in each interview was presented to the participants to ensure accuracy of data. What’s more, confidentiality and anonymity of research participants were safeguarded throughout the entire process, enhancing the ethicality of my study further.

## 4 FINDINGS

This chapter presents the findings of my empirical research. Firstly, I introduce the viewpoints of the interview participants on the future of mobility. Secondly, I present key findings about the vision and MaaS Global's business model. Thirdly, I examine drivers that encourage platform contributors, namely transport service providers, to join a platform ecosystem, in this case the Whim app. Finally, I present the concerns that potentially discourage platform participation. I divide the chapter into sub-chapters to provide clarity and logic reading flow. All findings are supported by direct quotes from interview participants which were extracted from the transcribed interviews.

### 4.1 Towards the future of mobility

Most service providers participated in the interviews agreed that the transportation industry is changing. Specifically, it is said that car ownership will decrease because urbanization makes it increasingly difficult and expensive to own a car.

*“Urbanization will make it more difficult and expensive in owning a car.” (Partner 5)*

Changes in customer preferences and in legislations were also highlighted as the key factors to disrupt the industry. These two factors will be explored in more details in the next sub-chapter. Additionally, technological advancement and new types of competitor were also outlined as contributing factors.

*“New players are coming, not only MaaS players, but also more traditional players also in our current business market. We see this kind of big change both as challenge and opportunity. We are ready for it, from mindset point of view and also from the technical capabilities and service capabilities so we are ready for the competition.” (Partner 5)*

*“In the future, it will of course move towards automation somehow but not very fast. There are many ongoing projects, e.g. automatic cars.” (Partner 6)*

It is noticeable that the majority of interview participants expressed positive attitude towards change. Instead of resisting, they accepted that change is coming and that they need to adapt

their current business models. One service provider openly acknowledged that the mindset needs to move from product-oriented to service-oriented.

*“Personally, I believe in it. I really think that it should shift towards service.”* (Non-partner 1)

Several service providers also showed that they understood the potential benefits of new mobility solutions, such as MaaS, which integrate various transportation modes in the same platform to respond better to customers’ demands and needs.

*“MaaS is about offering different options to move around, with or without an app. I like to think that future of mobility is less emission and better mobility. [...] MaaS is about making more out of the existing resources, so increase efficiency in transport system and at the same time offer better customer experience for all people who use transport.”* (Non-partner 2)

While all interview participants agreed that change is coming, they had different opinions on how fast the change would manifest. Some said that it was very close now, while others said that it was only a hype and we need to wait and see what will happen.

*“Personally, I believe in it. I really think that it should shift towards service. I own a car and it mostly stays in our parking area, so it does not make a lot of sense. Economically, there is no point of having a car, so it is very interesting to see when the MaaS service gets so good that I would give up my own car, I think it is very close now.”* (Non-partner 1)

*“About car ownership, I would say that it is not going to decrease with a speed that MaaS hype believes. I have seen different estimates that probably car ownership in dense cities will decrease. It is not going to be fast in the short-run but perhaps in the long run it can be much more dramatic.”* (Partner 3)

## **4.2 Mobility-as-a-Service from the platform provider’s perspective**

The sub-chapter provides an understanding of the vision and business model of the Whim app, the case company that serves as an example of MaaS.

## Vision

When asked about how he saw Whim app in the future, the CEO of MaaS Global, Mr. Sampo Hietanen, used the analogy of a mobile operator to describe his vision.

*“We want to be the person’s individual mobility operator, like mobile operator, to take care of all their trips and mobility needs. The idea of that is to be comparable with a personal car.”*

Throughout the interview, he repeatedly emphasized that he considered Whim as a service provider, as opposed to a reseller or a platform.

*“Our business logic is not to make 50 different TSPs available and show them to the end users and take the margin out of each transaction. That’s not the logic.”*

*We see Whim as neither reseller nor platform, more like a service provider. We provide a complete service, and in order to do that we provide the mobility service from different components. The idea is we, as a service provider, will select the right pieces for you instead of just presenting you all kinds of options. Operator business might be a better analogy.”*

He envisioned that there would be three levels of evolution of the Whim app. The first level is to take care of mobility need. The second level is to provide service level. The third level is to provide entertainment and experience during the commute.

*“First, it is a one-stop shop, that you pay as you go. In the next level, we can give you the service promise, e.g. pickup time, certain service level. After that, it becomes much more about how we entertain you, what kind of experience do we give during your travel.”*

*For instance, if there would be some companies who can make sure that every morning you get your favorite coffee at the platform then we definitely would love to add that to the service.”*



Essentially, he imagined that in the future the experience during transportation would be more important than the transportation itself.

*“Let’s say in the future, you don’t really care about how we get you there. You start to care much more about the 90 mins you spend there and what we can offer you in those 90mins. And the whole transportation becomes the background issue in that.”*

### **MaaS Global’s business model**

Mr. Hietanen, states that to be up and running, a Mobiliy-as-a-Service requires three basic transport modes: public transportation, taxis or taxi-like services, and car access. Bike access is also considered important in many cities.

*“At the minimum, we need public transport as a core both in cities and intercity. Because public transportation alone isn’t comparable to a car, we need taxis, or taxi-like service (share/non-share) to give more diversity and more supply-density in that sense. Then we definitely need access to cars. There are different forms of access to car that we need (short-term for within the city, a bit longer term would be daily or weekly usage for getting out of the city).*

*Also, it seems that in the areas where we operate, access to bike seems to be more and more relevant.”*

Mr. Hietanen added an additional fifth element which he described as something cool to get people excited about the service.

*“The fifth element is ‘something cool’. With the first three/four elements, we can have it going but to get people excited we need something more. Something that is locally available, something special that people consider it cool, whether it’s helicopter ride or balloon or special ferry or Segway or motorcycles or extremely fancy cars.”*

Currently service providers could plug-in to Whim ecosystem through API.

*“We already have some providers that just plug-in. It means that you plug-in to the API, sign a standard contracts, which then means that we’ll start paying you after that, as simple as that.”*

In terms of pricing, Whim purchases the services from transport service providers and then Whim charges users different prices for different service packages.

*“Our main logic is that the transport service providers might not want to price commission-based, rather towards Whim as production-based (price per kilometer, hours, and so on) and we price according to service levels.*

Furthermore, Whim aims to include different components in the service packages to increase the value in consumers’ minds. Additionally, Whim makes profits by encouraging users to use more public transports.

*“The assumption is that the price point in people’s mind is higher than the actual production cost. It’s classical price scheming. The more of those add-ons services, services that users do not really use but value a lot to have in the package, the better chance we have in making profits because we can show to the users the face value of the higher priced package.”*

*“At the same time, the more we can nudge users to the cheaper kilometer (walking, biking, public transport), the better money we’re making, that’s embedded in the business plan. We incentivize people with different rewards.”*

Finally, Mr. Hietanen recommended transport service providers to focus on improving their service offers to be competitive and avoid becoming commoditized.

*“The change in logic is that price is not the only element. Other elements would become increasingly important, such as location, service quality, experience. Such elements will start to play much bigger roles in the future. How good of a plug-in is your transportation becomes more relevant to compete on in that space. Current transport service providers have to create their own sales channels, so they compete much more on getting attention of the users instead of how good their services plug-in into people’s lives.”*

### 4.3 Factors that encourage service providers to join a MaaS platform

Representatives of service providers were asked what would motivate them to participate in a MaaS ecosystem. A number of key factors are identified, and then clustered into seven bigger themes: Industry trends, Business opportunities, Reputation and credibility, Learning, Partner relationship, Social contribution, and Transparency and convenience. The details are described in the following sub-sections.

#### Industry trends

The changes happening in the transportation industry help to explain why service providers perceive new mobility solutions, such as MaaS, positively. Six out of nine service providers highlighted the changes in customer preference, especially in younger generations. Specifically, decrease in car ownership and driving license, increasing concerns for the environment and increased share of public transportation usage are among the key elements that signify the future mobility landscape.

*“We see that the transportation industry is changing, especially in cities. We notice changes in cities and in younger generation's needs and wants. Young generations do not want to own a car anymore. Some of them do not even have driving license so they only use public transport and taxi services. They only need cars once in a while. They do not see owning cars as a big status like 20 years ago.” (Partner 4)*

*“In general, we are moving from ownership to sharing so socialization is the big trend behind MaaS. People are seeing that it does not make much sense in owning something that they only use a fraction of time. So, all this future mobility and the changing trends affect business in car financing and car insurance and we want to serve the future customers.” (Non-partner 2)*

Additionally, under the public concerns about environmental issues and increasing pressure on existing urban infrastructure, governments, and specifically Finnish government, have made legislation changes that enable favorable environment for new mobility solutions such as MaaS.

*“The biggest problem in large cities is that there are too many cars right now. Legislations are changing towards that direction. Everyone is saying that, governments, cities, we cannot continue this way.” (Partner 1)*

Such changes in both customer preferences and legislation motivate service providers to take actions to transform their current business model to prepare for future disruptions. One service provider specifically talked about new types of competitors who are not traditional transportation players but come from high-tech industry.

*“There are new types of competitors from other industries, so we need to think about competitors more broadly, e.g. Google, Amazon. Even though they are not in car business, they might be in the future and when they come, it is going to disrupt the retail business. To tackle that risk, we need to be part of a bigger platforms and together they can compete with those tech-native giants. We have to be part of several ecosystems because if we will not, somebody will and that is a risk.” (Partner 1)*

*“Considering the changing market landscape, we are aware that we need to change our business model in the future. It is a top-down strategic decision that we need to transform ourselves to a mobility company, not just a car manufacturing company. We do not necessarily know what 'mobility' business actually means though. But that is why we are here, to learn more if it is going to happen or not. Basically, we are trying to search for signals, if this and this companies are successful it would mean that this phenomenon is now going forward.” (Partner 2)*

## **Financial gains**

All service providers agreed that potential financial gain was the first and foremost important factor that influences the decision to join a MaaS platform. Financial benefits can be gained by increasing volume from either additional sales channel or new customer segment.

*“There is huge potential, like never see before. It is a huge industry, if we compare to telecom industry for example. If people spend like 30EUR per month for telecom then they spend 300-500EUR for traveling and for moving from A to B. It is really huge business.” (Partner 2)*

*“We are a company, so it is important that we make profits, for our drivers and also for ourselves. The money is always behind the decision.” (Partner 6)*

*“It’s a business decision whether we see that we get that much more profit out of it to cover the costs. It is the main criteria. It always comes back to the business figures. We need to see that it makes sense business wise to join a MaaS platform. It needs to have a value and not just joining for the hype.” (Non-partner 2)*

*“In business, it all comes down to income vs cost, at the end it has to either increase your income or decrease your cost. Doing a partnership doesn’t necessarily decrease our cost easily. It is more about increase income with new customers. The new income has to be big enough so that is why we look at big countries or big cities.” (Non-partner 3)*

Firstly, six service providers perceive MaaS platform as an additional sales channel through which they can reach more customers and thus increase revenues. Two out of three service providers who have not yet partnered with MaaS Global (non-partner) emphasized that a sizable customer base would play a big role in their decision-making.

*“We see it as a channel for volume. This is one sales channel that we want to be a part of, just like other location brokers. We have already quite a lot of locations (brokers) where volume customers came in. Thus, from our viewpoint it is not much change in service, so it is not a big deal [to join a MaaS platform].” (Partner 4)*

*“The more trips to us, the better. The more channels there are, the more services we are in, the better. We can see that we are getting more trips and more revenue. With good pricing, there is no problem in it. It is always a good thing to have more trips for our drivers. So far, there has been a moderate growth in trips which contributes to revenue.” (Partner 5)*

*“If Whim or any MaaS operator is in 50 countries, if you’re big in New York, London, Shanghai, or Bangkok that we can see that by doing this integration and partnership we can reach millions more of people right away then it would be a big reason enough for us to consider it.” (Non-partner 3)*

It is no surprise that most service providers expressed their openness to be part of multiple MaaS platforms because the more channels they are part of, the better chance they have to reach more customers. Additionally, multihoming cost is considered minimal because from the technical viewpoint, once the integration is done with one partner it does not take much effort to repeat it for other partners. Lastly, service providers are motivated to join multiple platforms because MaaS is still a relatively new concept and they are uncertain which player would be the winner.

*“We see that it is wise to have many channels, so we do not “put all your eggs in one basket”. We see MaaS as a new kind of sales channel, so we are open to part of new ecosystems too. We already have the knowledge and have learned a lot with MaaS Global, so it will not be that big of an investment. We will check the case: how much work it takes, how much profit we can expect. Of course, we don't want to jump to everything. If there is something good, we are open for collaboration. But we do not say no, that is for sure.”*  
(Partner 1)

*“We open the interface and we said, please different players, MaaS Global and others (similar international companies), if you want to try, there is business opportunity put in Helsinki region. We definitely hope that different players will take our ticket in their package, whether it is MaaS Global, MoveIt, Google, Transcent from China, event organizers, tourists, etc. We said also to Turku, Tampere, which have their own mobile tickets, that if you want our ticket for your application, please do.”* (Partner 3)

*“We want to keep our option open, no exclusive contract. If there are other MaaS operators, we can consider joining them too. There are always some costs involved in integration. But then multiplying isn't that expensive that more.”* (Partner 4)

When choosing among several MaaS platforms to participate in, several service providers highlighted that pricing is the decisive factor because it directly affects the business case and potential financial gain from the partnership.

*“When we think about MaaS, one key consideration is the economic flow. What MaaS Global offers to us is good, economic wise. There are some other MaaS operators’ offers but they are too low cost. From economic side, it is not affordable and not enough to*

*provide the services. With Whim, it's not very good, but it's good enough. The drivers get enough money for their rides. When the benefits are higher than the costs, then it is ok."*  
(Partner 6)

Additionally, several service providers see MaaS as an opportunity to reach completely new customer groups, who do not normally use their services. The new segments are said to be either car owners or local citizens. Therefore, these service providers are keen to support MaaS because a growth in MaaS means an increase in the overall market.

*"For us, it is an opportunity to gain new local customers and to create a new customer base. Traditionally, our customers are those who fly to a new place and needs a car there. So we see MaaS as an opportunity to offer our services to local users who actually live and work in Helsinki, who probably do not own a car, who use mainly public transport and taxi services for commuting, and maybe once in a while need a car (visit relatives, carry big furniture)." (Partner 4)*

*"Companies like MaaS Global give us an opportunity to target new customer segment: people who currently own cars. Their business is to help people choosing mass transport instead of personal cars. Thus, we are of course happy to partner with them. It is their business to push people to mass transport and that is good for our business."* (Non-partner 1)

It is worth noting that even though financial benefit is one of the most important factors, the majority of service providers do not expect immediate gains and express their willingness to wait for delayed paid-off in the future.

*"Right now added revenue is not a priority. Priority is to collect data and learn and hopefully slowly we're shifting towards making it profitable."* (Partner 1)

*"So far, the focus is not to become rich or make a lot of money immediately, that is not our target. Maybe in the future. Of course, when we invest money in something we expect to get our money back one way or another. But now is not the time, perhaps in the future."*  
(Partner 2)

*“MaaS Global does not provide so many trips yet, about 200 trips per month (we have 400k trips per month in total). It is not a big part of our business but even then we are keen on working with MaaS Global. Of course, when there is no benefit anymore then we have to reconsider whether we should continue the cooperation.” (Partner 6)*

## **Reputation and credibility**

Besides direct financial benefits, many service providers mentioned that they enjoyed the spill-over publicity and positive recognition surrounding the MaaS topic.

*“The hype and PR side of this, it has also value. Organizations around the world are quite interested to see what is happening here [in Helsinki].” (Partner 3)*

Some service providers explicitly mentioned that being part of a MaaS platform is an inexpensive marketing way to increase their brand visibility and to target new customer groups. Additionally, two service providers revealed that positive employer branding – being perceived as innovative and sustainable – would improve their image and help them to recruit young people.

*“It is an inexpensive and easy way of targeted marketing. If we invest our own money for marketing (e.g. ads on bus stop), it is expensive to reach new customer groups - people who normally use public transport and do not own a car. We find being part of Whim is even less expensive than putting money to Google.” (Partner 4)*

*“It is quite often that we are seen as old and conservative company, so it is good for our image to be associated with an innovative startup.” (Non-partner 1)*

A few service providers pointed out that the MaaS operator needs to have a credible reputation because it would provide a sense of trust and comfortability for them to enter the partnership.

*“When you do a partnership decision, you need to look at the holistic picture. If it is a controversial company who have faced public scandals, a partnership with them would affect to our image and we care about how our customers see us. If the partners have good*



*reputation and very polish image, it means doing a partnership would also improve our image from customer point of view.” (Non-partner 3)*

## **Learning**

Five service providers particularly emphasized how much they valued the learning aspect of joining a MaaS platform. Some perceived it as an opportunity to scan and explore new possibilities in transportation industry. All players are aware that the world is changing and that they need to adapt to respond to new customer needs. However, no one knows which idea would be the winning one or which direction is the right one to pursuit. Being part of MaaS gave them the front seat to see how things will unfold and how the future of mobility will look like.

*“Learning is the biggest thing. Learning how this whole thing works, how this company works, what are the business opportunities in this industry. The second priority is to really find new business cases for our company in this MaaS concept.” (Partner 2)*

Additionally, innovation spill-over and the possibility to develop new services were mentioned by four service providers. Being part of a MaaS ecosystem allows them to focus on their core services while building new digital capabilities.

*“Our expertise is car, and we are not good at developing app. Thus, it makes good business sense for us to join a platform and collaborate to develop new services. We see the potential to innovate new products for MaaS ecosystem. Together with Whim, we have been testing a lot, we collect data to learn about how people use car and their mobility needs in general.” (Partner 1)*

*“We support MaaS project because we know that we cannot work alone here. We cannot close ourselves. We do not have so much money to develop our own project and capabilities. We understand that we are one part of this whole transportation system, including train, buses, own cars, etc. MaaS Global is connecting them all.” (Partner 6)*

One non-partner openly said that they would be highly interested if they could leverage the technical platform and customer base of Whim to test and develop new services to complement their core business.

*“We would be interested in having a close relationship in which we can develop new services together so that it would not be just them selling our tickets. It is an opportunity for us to develop service ourselves then push to the MaaS app. We can then leverage their systems to gain information and test trial on their operator app so we basically develop new services together.”* (Non-partner 1)

Two service providers also pointed out that they leveraged the initiative with MaaS Global to change the working culture within their companies to be more innovative.

*“Being part of Whim helps us to establish new way of thinking inside our company.”*  
(Partner 1)

*“By collaborating with MaaS, we can learn from their new way of doing business in transportation. Even if you are not so good in innovating yourself, you should keep other innovators close and learn from them.”* (Non-partner 1)

However, it is worth noting that all these service providers mentioned above are traditional transport players who are still operating with old legacy systems. When being asked the same question, two born-digital service providers did not make any remarks on the potential learning benefits of joining a MaaS ecosystem. In fact, one of them explicitly said that she did not see much learning benefits.

*“There is not much learning benefit for us. We already learn a lot in our own business development.”* (Non-partner 2)

### **Partner relationship**

Quite many service providers pointed out that the support of MaaS Global has been a crucial factor to ensure smooth integrations with straightforward testing and trial phases. Being able

to have dialogues to solve emerging problems as equal partners was highlighted as a key factor to build trust and have positive collaborations.

*“The cooperation with MaaS Global works quite smoothly. When we have a problem, we can have a dialogue and solve it within one day.” (Partner 4)*

*“We would want to see good support and dedicated resources from the new partners. They would be doing a lot of work and be helpful, trials would be very clear.” (Non-partner 3)*

One service provider openly talked about how MaaS Global supported them to promote this new concept to their drivers. Such action was highly appreciated by the service provider because it illustrated mutual respect and shared goals between the partners.

*“MaaS Global collaborated with us to promote the concept to the drivers and explain that MaaS is good for drivers and they will get more money. We have had events with drivers and MaaS Global have participated in those events. We have something called Whim driver of the month and we give small gifts to the drivers. MaaS Global respects their partners to work together, it shows that we as an operator are at an equal level and that we can discuss with one another. When there are problems, both sides jointly solve it because we have the same goal. That is very good.” (Partner 6)*

## **Social contribution**

Being able to contribute to greater environmental and societal causes was mentioned by two service providers as one motivation for them to join MaaS ecosystem. The contribution is related to transportation specifically and it is at the core of the vision and mission of MaaS concept: to provide an alternative solution to private cars to move people from A to B in a more sustainable and environmental-friendly way.

*“The main motivation for us would be that if there will be a harmonized integrated solution that would help people for trip change and would ease the switch from car to public transportation. If the future will be developed in a way that it would extremely seamless for people to use public transportation whenever they are, effortless, and enable people to give*

*up car ownership and take sustainable solution, that is definitely something we are looking into.” (Partner 3)*

*“All the trials to fight against car ownership is a good thing. The stronger MaaS is, the better the world will be in general. To make the world a better place, we should cooperate and make new business together to reduce the number of cars.” (Non-partner 1)*

### **Transparency and convenience**

One born-digital service provider, who provides its food delivery service via mobile application, clearly stated that he expected the platform to have clear instructions and communication to support technical integration. Transparent and fair earning logic was also mentioned as one of the criteria to choose which platform to participate in.

*“It needs to have a good API for the services to communicate. Connection to the platform should be really easy from technical point of view. The platform needs to be managed well, meaning very clear and fair, so you know when you join the platform you can easily calculate how things would go and how much you can get from it.” (Non-partner 3)*

## **4.4 Factors that discourage service providers to join a MaaS platform**

Service providers were also asked about the barriers that might prevent them from joining a MaaS platform. Three major concerns are identified and described in the sub-sections below.

### **Cost consideration**

While financial gains are the key incentive for service providers to join a MaaS platform, cost consideration is the key barrier. Cost consideration refers to not only literal money but also time and effort. It includes development costs, maintenance costs and most importantly, technical integration costs. Specifically, six out of nine interviewees highlighted that API integration is the biggest challenge.

*“Ticketing is the most complicated, it is the main barrier and most expensive. Data is much easier. But each region, city and country has come up with its own ticket solution, which means the amount of work for integration is extremely high. The technological barrier can*

*be quite challenging. Unless we can somehow harmonize digital ticket solution around the world. But so far there has not been any kind of need to standardize them.” (Partner 3)*

*“API is our biggest challenge. We are a pretty conservative company. The business is built based on old legacy system. How to keep up with new thinking and how to build up the API is quite challenging. We are still struggle with it.” (Partner 4)*

*“If it is really easy for us, if we could achieve it without any big change in our core focus area, then it might be interesting to have a chat. But from our experience, doing any kind of integration with any other service providers is a huge hassle.” (Non-partner 3)*

Additionally, cost consideration refers to opportunity cost. All three non-partners of Whim mentioned that prioritizing limited resources is one factor they need to consider carefully before making partnership decision. They explained that often the companies have other priorities in the agenda and thus there is no resource left to start a MaaS initiative.

*“We are working in a small group, so we need to focus and prioritize. We have 1-2 key focus on developing the actual services. That is why we have not joined any of the MaaS ecosystem.” (Non-partner 2)*

*“When you’re running a business, you have limited resources (people, money) so you want to spend your resources on things that bring you the most benefits and most profits. When considering a partnership, the key consideration is the opportunity cost: if we do this then we cannot do something else, and usually the something else is more important to us, so we concentrate on that. Doing integration with a partner that is smaller than us or same size as us means a lot of work without guarantee for profit/benefits. Then we would rather just concentrate on our own game.” (Non-partner 3)*

Lastly, cost consideration also refers to potential risk of cannibalizing current business. Only three service providers mentioned it. One was concerned particularly about pricing but in general cannibalization was not considered as a major risk that would have significant impact on their decision-making.

*“We do not want to cannibalize our own business. The current rate is cheaper than what we have for our corporate users. It is hard to explain to our corporate users that we have a cheaper price for Whim. We need to explain that it is a different business model. We differentiate the business between Whim and normal business. So that is one challenge.”*

(Partner 4)

*“It is the risk that it starts eating our traditional business. We do not think that it is a big risk, but it is a potential risk.”* (Partner 5)

## **Control**

Concerns about control and decision rights were raised by many service providers. It is noticeable that all three non-partners shared similar remark in this aspect, indicating that it might play a significant role in preventing service providers from joining a MaaS platform. Specifically, the concerns are related to four aspects: negotiation power on pricing, ownership of customers, control of data, and brand recognition.

Firstly, service providers stated that negotiation power and especially control on pricing is a major concern. Service providers are not used to letting someone else set the price for their services. There is a general fear that their margin would eventually diminish due to competition and a lack of control over their own pricing. In general, it is perceived that the pricing process could have been explained more clearly to provide a sense of transparency and fairness.

*“When you are in somebody else platform, you are dependent on them and you do not have the right to make decisions about it. If you are on the platform, do you even have the right to say? If you are just the provider, how much can you ask for, do you get to ask this and this if you get business/revenue anyway from the platform. MaaS Global invests a lot in marketing to buy customers and buy stuffs from the providers. Can Whim be like we have a good platform, give us the price, and we do whatever we want? Is it going to change? When Whim grows, do they have more leverage and more power to say: this is our terms?”*

(Partner 1)

*“I'm not sure who sets up the price XX EUR/day. Maybe [another service provider] sets up the price because they are the one who funds MaaS Global, so they discuss with each*

*other about the rate and now we have to answer that. [...] When we signed the contract, the price is not yet set, but now it seems to be set the price level, in our opinion is quite low so there is not much profit for operators. We do not have much influence on the price. It is a game changer that somebody else would set up the price for us.” (Partner 4)*

Secondly, all three non-partners stressed that they would like to own the interactions and relationships with their customers. They explained that it was necessary to provide good service experience.

*“We would like to have as much control as possible to operate efficiently and offer the customer service level we promise.” (Non-partner 2)*

*“We want to own our customers, own our experience for [party 1] and for [party 2] because that is our competitive edge – to be good at what we do and provide good experience for all parties. That is why we are not big fan of partnering with other companies and take risks of losing the customers or not fully in charge of the experience.” (Non-partner 3)*

Although having the same concern, one non-partner pointed out that joining a MaaS platform does not necessarily mean a loss of customer relationship because it can be shared by both parties.

*“We are shifting towards sharing customers, maybe the idea of ‘our’ customers vs. ‘your’ customers is outdated. But it should be taken into account in the beginning of the negotiation.” (Non-partner 1)*

Thirdly, in the era in which data is the key to unlock new revenue streams, it is no wonder that the question who owns the data was brought up. Two service providers said that at the very least they needed the data to operate their services efficiently.

*“We need to know the data to operate the services, e.g. peak of demand. It is crucial for us to plan and operate car sharing service.” (Non-partner 2)*

Lastly, two service providers discussed the risk of losing brand recognition and becoming commoditized services which are offered under the MaaS operator brand. It will potentially reduce their margin and consequently profitability if the services are no longer competitively differentiated.

*“We would like to eventually have products with our own brands within the platform. Otherwise, we produce the basic service, they [MaaS operator] will sell it under their brand [Whim] and get all the credits. Do we want to be just a provider, or do we want to build our own product? That is the thought we have to think about when it comes to ecosystem decision like MaaS Global.” (Partner 1)*

*“If we would not gain all the information that the MaaS operators have then we will eventually end up in a situation where we are just selling a bulk-type product and the MaaS operator doing the more valuable products on top of that.” (Non-partner 1)*

## **Uncertainty**

Five service providers expressed their doubts about the success of MaaS. Even when they believe in the concept, they do not necessarily believe that MaaS Global / Whim app is the winning player. It is understandable because MaaS is still a relatively noble idea and is going through different development phases. The concerns mainly focus on feasible business case, low population and density of Finland and scalability

Firstly, even though the Whim app is said to be one of the most advanced MaaS application, the company itself was not yet profitable by the time the thesis was conducted in early 2018. It would potentially explain why service providers are hesitant about investing in MaaS initiative.

*“The challenge is if you can find profitable business case out of MaaS – that’s the number one challenge – to find a business model for it.” (Non-partner 2)*

*“Another difficulty is that right now they are running things on investor money and whether they can make it to be something sustainable and robust is to remain to be seen.” (Non-partner 3)*



Secondly, almost all service providers agreed that Finland with its low population and dispersed density was a challenge to develop new mobility solutions.

*“For Helsinki region, we have scattered structure. That is something that Helsinki region has been blamed in Europe for years. The structure has been much more scattered, comparing to Stockholm or Copenhagen.” (Partner 3)*

*“I think it would work in cities with 1M+ people, but not in suburban areas. It has not been easy to create new services. For this kind of shared services, you need a lot of customers, i.e. great demand. Helsinki is a big city area with low density. It is difficult to put together and provide coordinated trips between several customers.” (Partner 6)*

This challenge naturally leads to the conclusion that Whim needs to expand internationally and to cities with big population to be profitable. However, the nature of transportation is location-specific. It means that there are various legacy systems and ticket solutions, posing a major challenge to scale for MaaS operator.

*“As a global company, it is really important for us whether it can scale and open new cities globally, or at least in Europe? It is a fear from our side that times goes by, five years from now and we are still here in Helsinki and just a couple of cities in Finland open.” (Partner 2)*

*“It is much more complicated for transportation. In Netflix and Spotify, the whole products are digital, and so you can scale fast. Once you have the solution, you can scale, there is no region barrier. But for transport services, they are extremely local. When you build something over here, you cannot just replicate it to another city. Those legacy and ticket system behind are all different between cities.” (Partner 3)*

*“In many places, there are national railway and public transport operators, so it is not that scalable.” (Non-partner 2)*

## **4.5 Summary of key findings**

The following figure summarizes the key findings of this chapter.

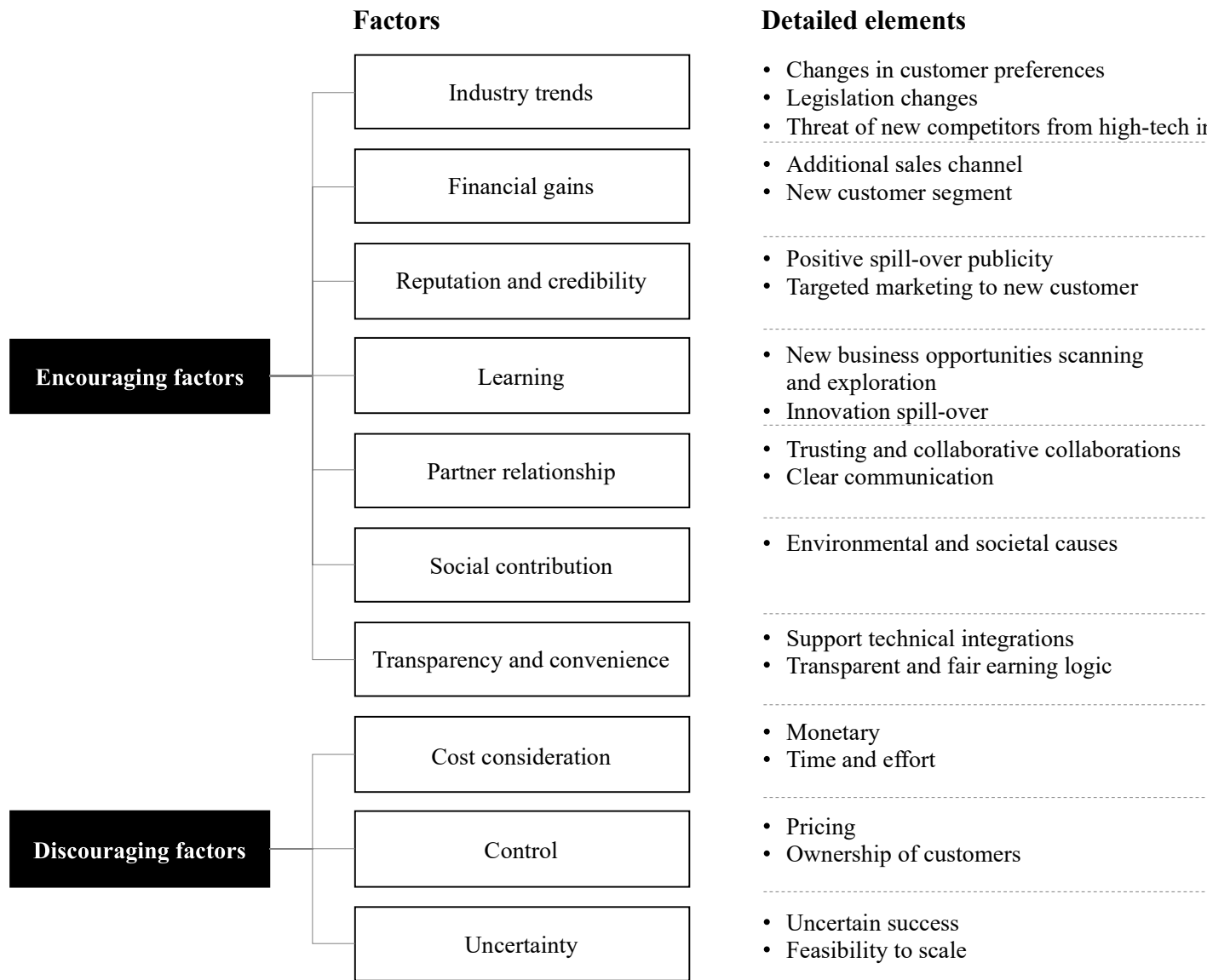


Figure 8. Encouraging and discouraging factors for platform participation

## 5 DISCUSSION AND ANALYSIS

This chapter presents an in-depth discussion of the research findings, an analysis that is done based on existing literature. The chapter starts by reviewing the MaaS model and the case company MaaS Global in particular from platform business theoretical viewpoint.

Next, to answer the 1<sup>st</sup> research question “What motivates transport service providers to join a MaaS ecosystem?”, I analyze individual factors that impact platform participation and divide them into two groups: those that are related to participants’ motivations, and those that are related to platform design. These individual factors are then grouped into four key factors that determine whether a service provider would join a platform or not.

Subsequently, to answer the 2<sup>nd</sup> research question, I discuss concrete levers that a platform owner can use to attract platform participants. Finally, I present a revised version of previously introduced theoretical framework.

### 5.1 Reviewing Mobility-as-a-Service model through platform business lens

While the current articles about MaaS describe MaaS as a platform business, my interviews with the case company MaaS Global reveal that the current business model is not a platform business model, at least not yet. To get the business off the ground, MaaS Global starts with a core offering that comprises public transportation, taxi and car rental [source: interviews]. MaaS Global pre-purchased units, such as kilometers or tickets, from transport service providers (TSP). They then bundle different modes of transportation and offer various package levels to consumers. In other words, MaaS Global plays the role of an intermediary between TSP and consumers. This recognition led me to review the company’s position along the continuum between pure reseller and pure multi-sided platform (MSP) (Hagiu & Wright, 2013). It seems clear that MaaS Global’s current business model leans more towards the pure reseller side because the company has significant control over the interactions between consumers and TSP, such as pricing and service displays, all but the actual service delivery.

There are three reasons why the current business model makes sense: economies of scale, aggregation effects and consumer experience (Hagiu & Wright, 2013). The current core offering includes public transportation, taxi and car rental, which are the main transportation

modes (apart from car ownership) used by people on a daily basis to get from A to B. The reseller position allows MaaS Global to achieve better economies of scale while taking advantage of the complementary relationships between these services. Additionally, in each city, there is a limited number of providers who offer public transportation (mostly just one or two), taxi (a few big ones that cover the entire city) and car rentals (a handful of global brands). Because of that, it is unnecessary to deploy MSP business model and it is possible for MaaS Global to make separate deals with each TSP. More importantly, by aggregating various transportation modes in one bundle package, MaaS Global ensures a better service experience for consumers in terms of ticketing, payment and booking because they do not have to deal with multiple agents.

The next question is then, would a platform business model be suitable for a MaaS operator, in this case MaaS Global? The vision of MaaS Global is to cover all mobility needs and eventually replace the need of owning a car. In the next development stage, MaaS Global will offer complementary transportation modes, such as carpooling, Segway and even hot air balloon. According to the founders, they are happy to include any existing transport services in a city in the Whim app (source: interview). This is where it gets interesting because we start to move towards the so-called long-tail products/services, those that respond to the needs of only a small niche of customers. The founders also wish to extend MaaS Global's offering beyond transportation to include complementary services, such as food delivery, groceries delivery and even coffee (source: interview). The aim is to customize their service offerings to each individual's mobility needs – a scale of customization that is prohibitively difficult for one firm to offer in-house. As a result, the types of service providers included in the Whim app becomes increasingly diverse when it reaches the next development stages. Indeed, Kamargianni and Matyas (2017) shared the same opinion that there are a wide range of services to be included in a MaaS packages, ranging from WiFi to entertainment services, such as newspapers, magazines, movies, and gaming services, to Food & Beverage services, such as discount or subscription to coffeehouses and restaurants.

What stood out from the interviews is that even the founders do not know who the complementary service providers might be. Two implications can be drawn from the interviews: 1) the need to enable external complementors to join the Whim app without knowing ex-ante who they might be and 2) the need to harness external services to complement the core service to tap into niche demands of mobility market. These two implications call for a large and

diverse ecosystem of external partners instead of a small defined network of supply chain partners, making it compelling to use the theoretical lens of platform business to examine the next development stages (Gawer & Cusumano, 2002; Parker & Van Alstyne, 2012; Gawer, 2014; Tiwana, 2013). Furthermore, the more TSP join the Whim app, both in terms of availability and diversity, the more desirable Whim becomes to consumers. Similarly, the greater the number of consumers adopt the Whim app, the more valuable it is for TSP to join Whim. In other words, there are potential positive cross-side network effects, a phenomenon that many researchers consider as a unique feature of platform business (Tiwana, 2013; Gawer, 2014).

Because of unknown ex-ante complementors, microsegments of the market and potential network effects, it is possible to posit that the business model of MaaS Global will eventually become more open and turn to a platform business. Researchers also agree that a platform business can evolve when it moves from startup to mature stage (Gawer, 2014; Parker & Van Alstyne, 2017). Tiwana (2013) also highlights that most successful platform businesses start as stand-alone products or services. Only when they successfully attract one side of the market do they open the business for the other parties to join in and effectively transform a traditional business model into a platform one. Choudary (2015) and Parket et al. (2016) also explain that it is necessary for a platform provider to start out as a traditional business before flipping to platform model when there is a need to model success and demonstrate that a market exists. I find this one particularly true in the case of MaaS Global because there are significant technical and regulatory barriers to aggregate the fragmented transportation markets.

To sum up, the current business model of MaaS Global, with the core offering of public transportation, taxi and car rental, is not yet a platform business. It is rather a core which might or might not turn to a platform business model in later stages. However, I posit that the next two layers of the offerings, as suggested in the vision of the founder (Figure 9), will be served as a multi-sided platform.

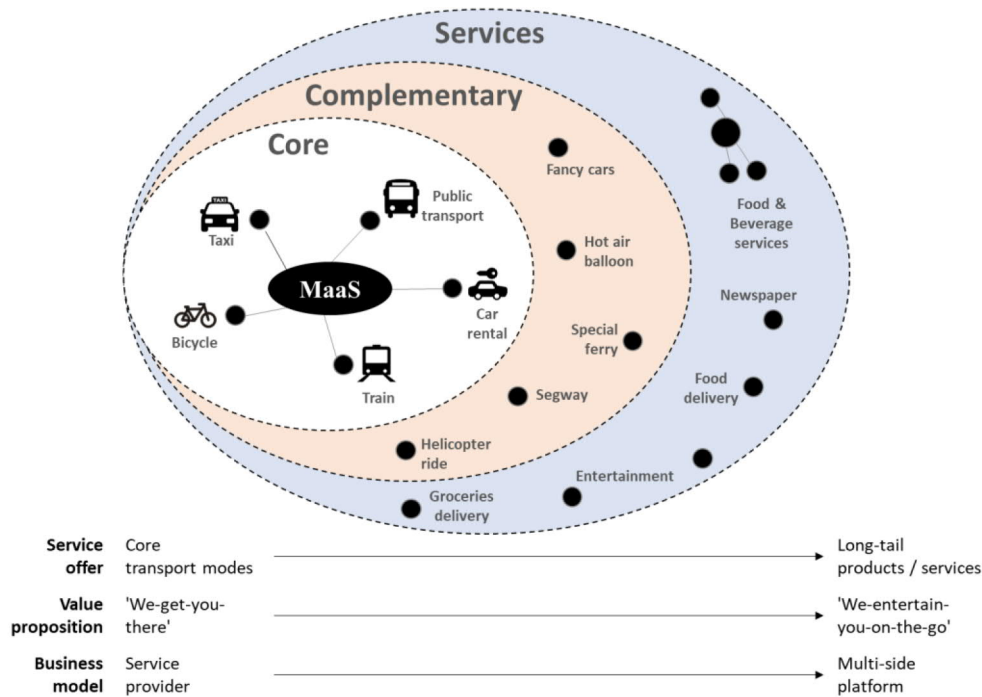


Figure 9. Illustrative Mobility-as-a-Service development stages

## 5.2 Motivations

The findings from this study show that motivations to participate in a platform is indeed heterogenous, both monetary and non-monetary. The four main motivations are 1) Financial gains, which is expected increasing revenue from new sales channel and new customer segment, 2) Reputation and credibility, which is positive spill-over publicity to enhance brand image, 3) Learning, which refers to opportunities to explore new business and to develop digital capability, and 4) Social contribution, which is related to environmental and societal benefits.

### Monetary benefits

All interview participants mentioned business opportunities, considering both *financial gains* and *costs*, as one of the main considerations. This finding is supported by various researchers who emphasize that economic-driven motivation drives platform participation (Tiwana, 2013; Van Alstyne et al., 2016). Specifically, interviewees highlighted that market access to a sizable customer base is crucial. Indeed, researchers refer to this phenomenon as network effects, which is a distinctive character of platform business to achieve growth and scalability (Rochet & Tirole, 2006; Hagiu, 2006; Evans, 2003). However, it is worth noticing that even when there is little immediate gain, interviewees express a willingness to wait for potential delayed paid-

off in the future. It means that financial benefit, even in a form of a promise, is still a powerful factor to attract platform participants.

### **Non-monetary benefits**

The study shows that non-monetary factors also motivates participants. Specifically, external providers are interested when they can benefit from *reputation* improvement thanks to positive publicity. Others consider the *learning* benefits they gain from exploring new business opportunities and testing new services most appealing. Others join a platform because they share similar vision in *social contributions*. These motivations are mentioned in previous studies of Benbya and Belbaly (2010) and Roberts et al., (2006). What's more, it is aligned with the viewpoint of Boudreau and Jeppesen (2015) who confirm that there are various sources of motivations besides sales incentives.

It is worth noting that while there are various motivations to participate in a platform, those found in this study lean more towards extrinsic side on the intrinsic-extrinsic continuum. Even though they are not strictly economic like financial gains, motivations such as reputation and learning are extrinsic nonetheless and can be best categorized as internalized extrinsic motivation (Von Krogh et al., 2012). This finding agrees with the insights from Bonaccorsi and Rossi (2006) who conclude that economic and technological motivations play a decisive role in a firm's decision, whereas intrinsic and social motivations are more typical for individual actors.

Additionally, it is important to recognize the impact of external industry trends on motivations. It is human nature to resist to change, or any disruptions to the status quo (Stevenson & Moldoveanu, 1995). However, the current trends in transportation industry help transport service providers to be more receptive towards new mobility solutions, including MaaS. Specifically, they are well aware of the ongoing changes in customer preferences, the decrease in car ownership, the rise of public pressure about environmental impact and new legislations. Therefore, they accept that new trends are coming, their industry is changing and thus, they need to adapt and take actions to prepare for the future. All these elements contribute to create a favorable environment for the emergence of new mobility solutions, such as MaaS. This finding signifies that there is a link between a platform success and the trends in its industry.

What's more, the study reveals that there is a connection between a firm's motivation and its background and capability. While the interview participants mentioned almost all motivations described in the previous chapter, the emphasis on which motivations are more important is somewhat varied. Specifically, traditional service providers, such as taxi and car rental companies, repeatedly highlight the learning benefits to improve their digital capabilities and develop app-based new services, whereas born-digital players focus more on the size of customer base and almost neglect the learning aspect of joining a MaaS platform. Similarly, public players express more interest in the social benefits for citizens and environment than private ones. This initial finding indicates that a firm's capabilities and background could influence its motivations to join a platform and thus, a platform owner could benefit from tailoring the approach for different groups of actors, as opposed to one-size-fit-all.

Overall, the study highlights there are various sources of motivation to join a platform, which include both monetary and non-monetary ones. They can be categorized in four main groups: *financial gains, reputation and credibility, learning and social contribution*. The study also reveals that most motivations are extrinsic, but it could be because the interviewees approached the topic from a firm point of view and thus, overlooked individual intrinsic motivations. Lastly, the study shows that motivations are influenced by not only a firm's capability and background but also external industry trends, such as changes in consumer preferences and legislations.

### **5.3 Platform design**

Researchers firmly believe that the platform design, including its architecture and its governance mechanism, influences the motivations of external players to join a platform. This sub-chapter will review how those elements are reflected in the findings of this study.

#### **Pricing**

Pricing control is one of the main barriers that discourage service providers to join a platform, which can be addressed by the platform's pricing policies. Interviewees explicitly said that they expect the platform to have a clear and fair earning logic. This factor is understandably highlighted because it directly impacts potential financial gains. Researchers agree that pricing is the key incentive to attract external service providers and it should align with the platform development stage and business model (Hagiu, 2006; Tiwana, 2013).



In the case study of MaaS Global, the platform owner pre-purchases the services (kilometers or tickets) from the transport providers and then bundle them to different packages for consumers. This pricing decision reflects a business model that leans more towards re-seller than towards multi-sided platform as mentioned in chapter 5.1. A disadvantage of the current pricing scheme, as revealed from the interviews, is that service providers are not comfortable with letting someone else price their services. Some interviewees questioned who makes the decision on pricing and whether it is fair, considering that there are several direct competitors on the platform and some have closer relationship to the platform owner than the others. It indicates that the communication on pricing could be improved to be more transparent and to foster trusting partnerships. Tiwana (2013) suggests that in software system, an ideal pricing policy allows the platform owner to decide access-based or usage-based fee and external complementors to price their own products or services. Regardless of which pricing policy is employed, a platform owner needs to ensure that its pricing is fair and transparent to encourage platform participation.

The literature also points out that through pricing policies, platform owner can achieve lock-in effect and thus discourage multi-homing. (Rochet & Tirole, 2003). However, in the case of MaaS, both the platform owner (Whim app) and the transport service providers explicitly stated that multihoming is necessary and exclusive contract is not desirable. Therefore, the impact of pricing on multihoming cannot be concluded in this study.

### **Transparency and convenience**

A smooth and easy technical integration is seen as important in their decision-making. To support the technical integration, interviewees expect not only well documented interfaces but also dedicated resources to support trial and testing. What's more, several interviewees said that the support from the platform owner also means clear communication and open dialogues. Interviewees mentioned that they felt respected by the platform owner and if there was a problem, they could discuss and solve it together. Cusumano and Gawer (2002) also agreed that information disclosure is necessary to encourage platform participation because it provides a sense of transparency and trust between the platform provider and its participants. Interviewees also highlighted that they appreciated MaaS Global's active participation in explaining the vision and the new concept to their employees. It gave a sense of togetherness, which strengthens the partnership between the platform owner and service providers. This

evidence shows that partner support goes beyond the technical side of a platform, i.e. interface descriptions and documentations. The ‘soft’ side, such as communication and open dialogue, is just as crucial to build a trusting and collaborative partnership.

Additionally, it is worth noting that some service providers mentioned that they are highly interested in the possibility to leverage MaaS technical platform to test and develop their own app-based products and services. They see it as highly convenient because they can focus on their core expertise, which is transportation. This view is supported by multiple researchers who state that the key benefit of a platform is its ability to provide a foundation upon which complementary products or services can be built while keeping development, transaction and coordination costs low (Tiwana, 2013). This plug-and-play nature is a unique feature of platform business which is determined by the degree of modularity of the platform architecture.

Platform literature states that a platform can lower the barriers to entry and increase ease of use by combining essential tools and functions to encourage platform participation (Parker et al. 2016). Interesting enough, in this study, apart from the API, the interviewees did not mention explicitly any specific tools or functionalities. This could be interpreted in multiple ways – perhaps the service providers do not consider tools and functionalities critical in their decision-making. Alternatively, it could be because many of them simply consider MaaS as another sales channel and thus they are not aware of, and not utilize the platform’s tools and functionalities. Either way, no concrete conclusion can be made based on the empirical findings and thus, further research is needed to have better understanding.

### **Ownership of customers, data and brand**

Several interviewees mentioned that ownership of customer interactions and data is essential to operate efficiently, elements that a platform owner can control through platform interface. It is in the platform’s interest that its external service providers provide great services. Indeed, the CEO of MaaS Global envisioned that transport service providers would be able to leverage the platform to develop new mobility solutions. Researchers recommend that stable and well documented interfaces would guarantee a smooth integration, communication and data exchange between external players and the platform (Tiwana, 2013).

Some interviewees had the impressions that the rules of the game were not entirely clear. For instance, they raised questions on how a transport service provider is chosen to receive a booking, and which criteria are used – is it pricing, location, service quality or a combination of all three. Some service providers were also concerned that their own brands would be not recognized once they were part of the platform, and consequently, diminishing their profitability. It demonstrates that clear agreements on rights, guidelines, tasks division, rules and procedures among other things are crucial to service providers. Indeed, Boudreau and Hagiu (2008) confirm that these cooperative boundary resources act as contracts between the platform owner and external players. They are used to manage the ecosystem, and consequently, encourage platform participation.

#### **5.4 Facilitating drivers that impact motivations to join a platform**

Ryan and Deci (2000) identify four key social and environmental drivers that impact motivations: expected tangible rewards, sense of autonomy, sense of competence and relatedness. By analyzing the empirical results, I have found evidence of all these four drivers. These four drivers are important because they can facilitate or undermine both intrinsic and extrinsic motivations. They are even more important because most motivation types found in this study are categorized as extrinsic motivations. Research has suggested that there are various forms of extrinsic motivations. More internalized motivations, meaning they are more assimilated to the self and are considered as self-determined, lead to better engagement and higher performance (Skinner, Wellborn & Connell, 1990). The above mentioned four drivers can promote such internalization process.

Firstly, service providers join a platform because they expect to gain financial benefits. Several interviewees believed that the future of transportation was changing, and Mobility-as-a-Service could be the solution for urban transportation. What I found significant is their willingness to wait for delayed returns in the future and not require immediate revenue contribution. Therefore, it is reasonable to claim that the expectation of rewards influences the motivation of platform participants. Additionally, it is shown that expected rewards include not only monetary increase but also intangible benefits, such as positive publicity, and digital capability improvement. This finding is in line with the consensus among researchers who define extrinsic motivation as doing something because of a separate outcome (Deci & Ryan, 1985; Battistella & Nonino, 2012).

Secondly, regarding sense of autonomy, the topic about control were raised in multiple interviews, especially with service providers that were not part of the platform. The participants were uneasy with the idea that someone would make decisions on their prices and would take over customer interactions. There were also unanswered questions about how the dynamic between the platform owner and service providers would be once the latter depends on the former to reach customers. It is not to say that service providers would lose their autonomy completely when they join a platform. However, it is safe to say that a lack of autonomy, or even just a doubt whether one would have autonomy, hinder motivation to participate. Indeed, several studies in classroom environment show that teachers who support autonomy learning encourage greater motivation, curiosity and higher engagement in their students (Ryan & Grolnick, 1986). Therefore, it makes sense that a platform ecosystem that grants external players their autonomy could attract more participation.

Thirdly, many interviewees expressed that their main reason to join a platform is to learn and to develop their own digital capability. More than one service providers found it beneficial to leverage the platform to test and innovate new products and services. By collecting data and sharing it with service providers, the platform provides crucial user feedback which enables better understanding of the mobility needs of consumers and consequently, service improvement. Ryan and Deci (2000) share the same opinion, stating that it is human basic psychological need to feel competent and actions, such as rewards, communication and feedback, that provide a sense of competence can boost motivation. Though we could not discuss in depth the functionalities and tools of the platform, I would posit that besides data sharing, a platform can provide feedback and rewards to its external players through its control mechanisms.

Lastly, interviewees disclosed that they felt a sense of togetherness and mutual respect when they enter the partnership with MaaS Global. It was because they could have open dialogues and communicate to solve emerging problems with the platform owner. Additionally, more than one interviewee discussed that they shared the same vision about the future of mobility with the platform owner – to reduce the number of cars and to make the world a better place, a shared goal that strengthens their partnerships. Researchers call it a sense of relatedness, which, like autonomy and competence, is a basic human need (Ryan & Deci, 2000). Therefore, feeling connected to a group, a common goal, or a culture is the groundwork to foster motivation.

This sub-chapter is significant because it bridges the gap between the what- and the how-questions of the study objective. In sub-chapters 5.2 and 5.3, we have answered the first research question on what the motivations to join a MaaS platform are. In this sub-chapter, from various sources and types of motivations, four specific social and environmental drivers are narrowed down, those that if being influenced in the right way could nurture motivations. It means that we are one step closer to answer the second research question on how a platform owner could attract platform participation. The details are discussed in the next sub-chapter.

## **5.5 Levers to motivate participants**

Analysis of empirical findings shows that there are six levers a platform owner could deploy to motivate platform participation. Those levers are: 1) Sizable customer base, 2) Fair and transparent pricing policies, 3) Modular architecture that enables innovation, 4) Clear agreements on decisions, rules and procedures, 5) Well-documented interfaces that allows smooth integration and data exchange, and 6) Dedicated resources to support partners.

To promote expected rewards, the platform owner can pull two levers. First is to grow a sizable customer base which is then strengthened by network effects, and second is to have a fair earning logic and transparent pricing policies. The interviewees explicitly expected that the platform would scale across geographic borders in the next few years. This finding is in line with multiple studies which state that the main reason for app developers to join a platform is to gain market access (Tiwana, 2013; Van Alstyne et al, 2016). Exponential growth is what differentiates platform business from traditional one. That is why growth strategy and pricing are the two most prominent researched topic in platform study. Thus, it is reasonable to state that by scaling the platform and providing clear pricing policies, a platform owner ensures service providers the potential financial rewards they could expect once they join the platform, and thereby, attract platform participation.

Secondly, a sense of autonomy can be fostered through the design of a platform, including both of its architecture and governance mechanisms. Specifically, a modular architecture would enable service providers to develop and innovate new offerings while leveraging the technical foundation of the platform. Multiple interviewees see joining a MaaS platform as an opportunity to collaborate and innovate app-based services, a capability that their organizations are current lagging behind. This finding is supported by multiple platform researchers. For

instance, Gawer (2014) believes that a modular design decreases the interdependency between the actors in the ecosystem and thus, enables more frequent and faster innovation than any traditional organizations could. Tiwana (2013) agrees that modularity reduces coordination costs while allowing external actors autonomy in design and innovation, and therefore, attracts platform participation.

What's more, there is evidence showing that decision rights and control mechanisms contribute to the degree of autonomy of a platform (Balwin & Clark, 2000). It is evident from the empirical findings that service providers would like to have authority to make decisions, especially about pricing, and customer interactions. There is a concern shared by multiple interviewees that joining a platform would diminish their negotiation power. Some interviewees also said that it was not entirely clear to them how the rules of the platform work. Tiwana (2013) suggests that decision right allocation should be in line with the architecture and it is ideal when both platform owners and external actors could contribute inputs to complement each other in decision-making. Similarly, through control mechanisms, a platform owner could enforce the "rules of the game" by rewarding desirable behaviors. In any case, there should be a mutual understanding and agreement between the platform owner and external players on who makes what decision. Also, a clear guideline on rules and procedures is necessary. In a nutshell, to be motivated, people need to feel that they make their own decisions, or stated differently, the needs for autonomy needs to be fulfilled.

Next, regarding a sense of competence, there is limited supporting evidence on what a platform owner could do. Because the MaaS platform in this study is still in its early stage and several participants consider it simply as a sales channel, we could not discuss in-depth about the tools and functionalities of the platform. However, service providers explicitly said that they see customer data as an essential source of insights, which is needed to operate efficiently and continuously develop their services. Tiwana (2013) suggest that stable and well-documented interfaces would support data exchange with external service providers. Additionally, one could posit that because various control mechanisms are used to reward desirable behaviors and high performance, they are essentially a form of feedback which could contribute to a sense of competence of platform participants. This hypothesis should be investigated further before a conclusion can be confirmed.

Additionally, it is evident that relational control mechanisms and partner support could

influence a sense of relatedness of platform participants. Tiwana (2013) said that through relational control, a platform owner sets norms, values and culture to align external players with the vision and mission of the platform. In this study, some transport service providers are connected with MaaS Global through a shared vision in which car ridership will be replaced by smarter and more sustainable mobility solutions in the future. Additionally, partner support, through dialogues and dedicated resources, helps to strengthen this sense of togetherness because it demonstrates mutual respect between the platform owner and its external providers.

Lastly, as mentioned earlier, a platform cannot exist and thrive independently from its industry context. Thus, even though a platform owner cannot directly control or influence industry trends, they should nevertheless leverage those macro-economic drivers in their growth strategy. It means, for example, be up-to-date on consumer preferences and any legislation changes.

## **5.6 Revised theoretical framework**

By the end of chapter 2, a theoretical framework was presented based on a comprehensive review of relevant literature. Through nine semi-structured interviews, it could be concluded that the theoretical framework proposed in the beginning is generally supported by the findings. Both motivational factors and platform design-related factors are presented in the study empirical evidence. However, some modifications are needed to reflect better the outcome of this study.

Firstly, this study found mostly extrinsic motivations to join a platform with little evidence of intrinsic one. The finding is supported by Bonaccorsi and Rossi (2006) who claims that while intrinsic motivations are more important for individual players, extrinsic ones are much more important in a firm's decision to join a platform. It is not to say that intrinsic motivations are not relevant in firm-level motivations but in the scope of this study, I revised the theoretical framework, providing more details on financial gains, reputation, learning and social contribution, to reflect the findings.

Secondly, all four facilitating drivers – Expected rewards, Sense of autonomy, Sense of competence and Relatedness – can be found in the study so they remain the same. However, there is not sufficient evidence to say whether they have positive or negative influence on the

participants' motivations. Therefore, the arrows now generally indicate that these four drivers impact motivations to join a platform, without specifying whether it is positive or negative.

Thirdly, there are two new additional levers that a platform could utilize to attract platform participations: Customer base and Partner support. While these two levers are mentioned in platform literature, they are not explicitly shown in the initial framework. Since those two topics occur in multiple interviews, it is reasonable to define them as separate levers to highlight their important roles.

Fourthly, the connections between platform mechanisms and participants' motivations could be confirmed. Specifically, monetary levers, including pricing and customer base, are linked with expected rewards, which in turn attracts platform participation. Similarly, modular architecture, fair decision rights and clear control mechanisms contribute to a sense of autonomy, which is essential for external players to feel motivated. While there is not much evidence to link platform and a sense of competence, one could argue that standardized interface that enables data exchange and control mechanisms impact a sense of competence. The latter is more of a hypothesis and needs further investigations, hence, it is shown as a dotted line. What's more, a sense of relatedness could be fostered through relational control with shared vision and partner support.

Lastly, macro-economic drivers are added as the foundation because a platform cannot exist outside its industry context and thus, their impacts need to be considered when analyzing platform participation.

Figure 10 below presents the revised theoretical framework.



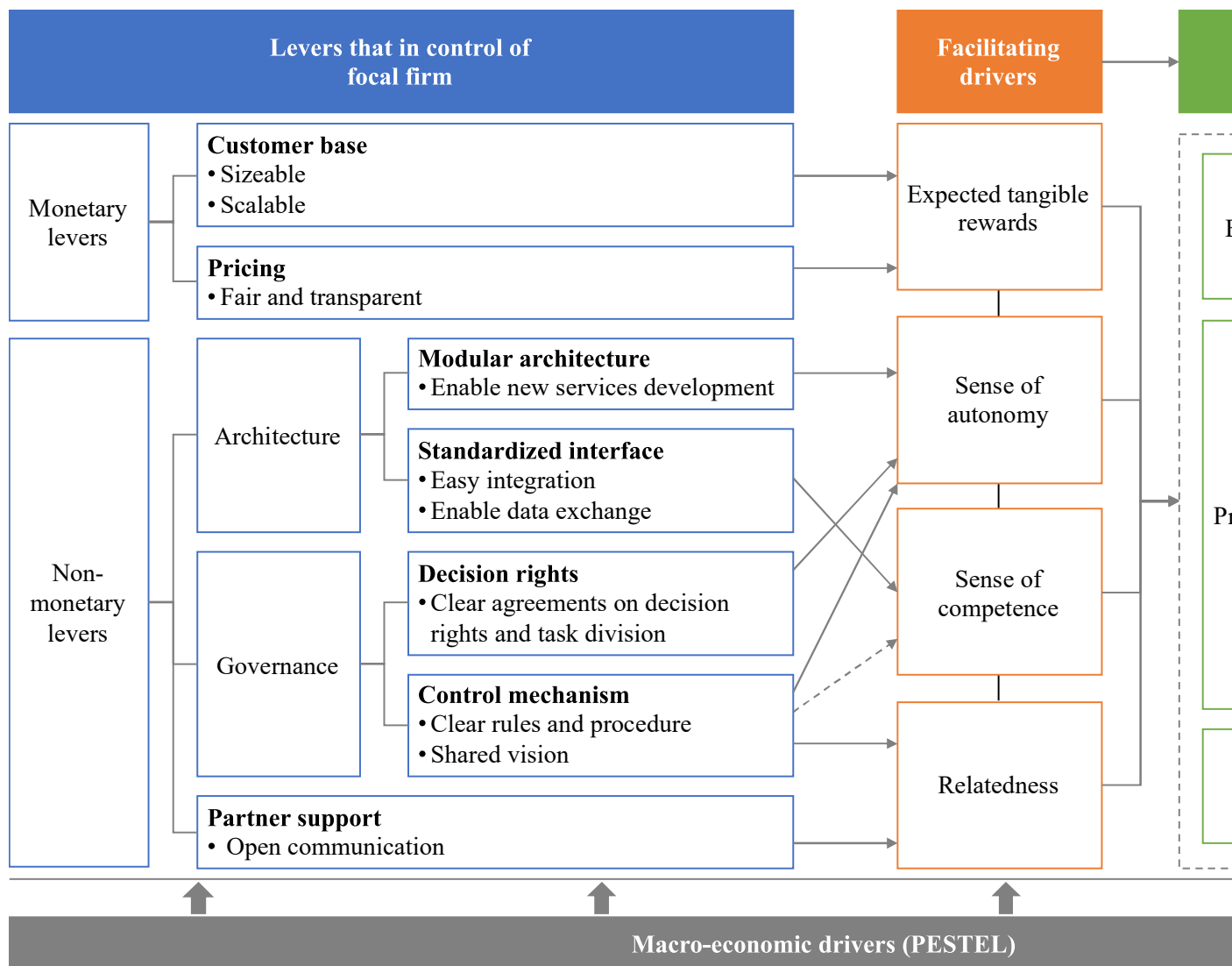


Figure 10. Revised theoretical framework

## 6 CONCLUSION

This chapter summarizes the main findings and their practical implications. Furthermore, I discuss the limitations of this study which future research should consider and suggest potential research areas to strengthen the findings.

### 6.1 Main findings

The objective of this thesis is to understand how a Mobility-as-a-Service ecosystem could attract service providers to the platform to improve urban transport. Specifically, the study aims to answer the following research questions:

*Research Question 1: What motivates transport service providers to join a MaaS ecosystem?*

*Research Question 2: How could a MaaS operator attract service providers?*

To answer the first question, the findings indicate that platform participation is driven by the service providers' motivations as well as platform design. Regarding participant motivations, the study found mostly extrinsic motivations, including both monetary and non-monetary ones. They can be grouped in four main themes. First is financial gains which refer to revenue increase through wider customer reach. Second, service providers are motivated to join a platform if it improves their reputation with positive publicity and recognition. Third, service providers consider joining a platform because of potential learning benefits that comes with exploring new business models and developing new services. Finally, social contribution is also one reason to join a platform, when both parties share the same vision and mission to improve the environment and community. On the other hand, platform design, both platform architecture and governance mechanisms, plays a critical role to attract service providers. Essentially, what service providers expect is a smooth and easy integration, clear and fair rules on pricing, decision rights and procedures, as well as supportive partnerships – all of which are driven by the platform design.

To answer the second question, this study reveals that there are four facilitating drivers that platform mechanisms can focus on to affect participants' motivations. Previously, platform business and motivations are studied as two separate topics. Through this study, the connections between the two fields could be confirmed. Specifically, a platform can positively

influence motivations of potential service providers by targeting the following four areas. First, *expected rewards* can be promoted through a sizable customer base and a fair pricing policy. Second, *a sense of autonomy* can be ensured with a modular architecture and clear agreements on decisions rights. Third, *a sense of competence* can be provided with standardized interface and potentially control mechanisms. Finally, *a sense of relatedness* can be fostered with control mechanisms and partner support. Since the motivations found in the empirical research are mostly extrinsic, these four drivers are critical to promote the internalization process of extrinsic motivations, which eventually leads to better engagement and higher productivity.

Besides providing answers for the two research questions, the study also reveals that the current business model of the case company MaaS Global leans more towards traditional business with a potential to turn into an open platform ecosystem in the future as shown in the vision of the founder. This finding confirms the theory which suggests platform business to start as a stand-alone product or service with a traditional business model before flipping to platform model (Gawer, 2014; Choudary, 2015)

## **6.2 Practical findings**

This thesis highlights several practical implications that can potentially help platform providers to attract different groups of service providers to the platform.

In a nutshell, the study confirms that how a platform is designed, in terms of architecture and governance, play a crucial role to attract platform participation. Specifically, the platform owner should demonstrate a clear business case with tangible financial gains. Additionally, pricing and earning logic needs to be transparent and fair and pricing policy should be communicated clearly with external providers. What's more, a platform could increase its attractiveness by providing a smooth technical integration with dedicated partner support as well as potential toolkits to enable testing and developing new services. Finally, clear understanding of decision rights, procedures, and data exchange should be established between the platform owner and external service providers. In other words, the rules of the game should be transparent and consistent among the participants to minimize complexity, uncertainty and potential integration and coordination issues.

In addition to platform design, platform providers could tailor their approach to appeal to different groups of service providers. The findings indicate that service providers join a

platform for various reasons and their motivations are connected to their firm capabilities. Therefore, the platform provider is recommended to actively discuss and listen to potential participants in order to respond to their needs.

Overall, to attract third parties to a platform, the platform provider should provide a compelling business case with clear financial benefits. It is critical that the platform owner builds a trusting relationship with its external service providers by putting the benefits of the ecosystem above its own gains. At the same time, the platform should be open and accessible, with flexible, fair and transparent governance mechanisms.

### **6.3 Limitations of the study and suggestion for further research**

The findings and its revised theoretical framework bring us one step closer to understand how to motivate participation in a platform in general, and specifically, in a Mobility-as-a-Service model. However, there are some limitations that future research should consider in order to strengthen the findings. Firstly, this thesis focuses on only one case study of MaaS Global with the aim to build and explore theory purpose. Therefore, further research with multiple cases and a larger sample, not only within mobility/transportation but also other industries, such as hospitality, travel, and retail, is necessary to validate the empirical findings and to gain a comprehensive understanding of the topic.

Secondly, because the case company is at an early stage of a platform business, there is limited understanding on the functionalities and tools and how they impact platform participation. Part of the revised theoretical framework remains as a hypothesis and requires confirmation from further study.

Thirdly, while the study found mostly extrinsic motivations, it could be because the interviewees responded from a firm-level perspective. Therefore, future study could further examine how individual motivations could play a role by interviewing key decision-makers of the companies.

Additionally, in terms of broadening the research scope, while this study focuses specifically on the service provider side, it would be interesting to understand the perspectives of other stakeholders as well, for example end-users and policy makers. I find the end-user viewpoint

particularly interesting because they are a critical factor to determine a platform's network effects and essential its success. Furthermore, extending the research scope to other countries could yield interesting comparative data to determine whether the factors identified in Finland would be differ across countries or not. Lastly, besides factors that attract participations, it would be beneficial to study factors that retain platform participants as well because it impacts platform success in the long-term.

## REFERENCES

- Accenture (2016). Trend 3 – Platform Economy: Technology-driven business model innovation from the outside-in. [Accessed on 01 May 2018].
- Adner, R. (2016). Ecosystem as structure: An actionable construct for strategy. *Journal of Management*, 43, 1, 39-58.
- Adner, R., & Kapoor, R. (2010). Value creation in innovation ecosystems: How the structure of technological interdependence affects firm performance in new technology generations. *Strategic Management Journal*, 31, 3, 306-333.
- Antikainen, M., & Vääätäjä, H. (2010). Rewarding in open innovation communities- how to motivate members. *International Journal of Entrepreneurship and Innovation Management*, 11, 4, 440-456.
- Antikainen, M., Mäkipää, M., & Ahonen, M. (2010). Motivating and supporting collaboration in open innovation. *European Journal of Innovation Management*, 13, 1, 100–119.
- Armstrong, M. (2006). Competition in two-sided markets. *RAND Journal of Economics*, 37, 3, 668-691.
- Atkins, (2015). Journeys of the future: Introducing Mobility as a Service. [Assessed 12 May 2018].
- Baldwin, C. Y., & Clark, K. B. (2000). *Design rules: The power of modularity*. MIT Press. Cambridge, MA, USA.
- Battistella, C., & Nonino, F. (2012). What drives collective innovation? Exploring the system of drivers for motivations in open innovation, Web-based platforms. *Information Research*, 17, 1, 17-1.
- Belenzon, S., & Schankerman, M. (2008). Motivation and sorting in Open Source Software innovation. LSE STICERD Research Paper No. E147.

Benbya, H., & Belbaly, N. (2010). Understanding developers' motives in open source projects: A multi-theoretical framework. *Communications of the Association for Information Systems*, 27, 30.

Bonaccorsi, A., & Rossi, C. (2006). Comparing motivations of individual programmers and firms to take part in the open source movement: From community to business. *Knowledge, Technology, & Policy*, 18, 4, 40-64.

Boudreau, K. J. (2010). Open platform strategies and innovation: granting access vs. devolving control. *Management Science*, 56, 10, 1849-1872.

Boudreau, K. J., & Hagiu, A. (2008). Platform rules: Multi-sided platforms as regulators. *SSRN Electronic Journal*.

Boudreau, K. J., & Jeppesen, L. B. (2015). Unpaid crowd complementors: The platform network effect mirage. *Strategic Management Journal*, 36, 12, 1761-1777.

Boudreau, K. J., & Lakhani, K. (2009). How to manage out-side innovation: Competitive markets or collaborative communities? *MIT Sloan Management Review*, 50, 4, 69-75.

Bouton, S., Knupfer, S., M., Mihov, I., & Swartz, S. (2015). Urban mobility at a tipping point. *McKinsey Insights*. [Accessed on 01 June 2018].

Brusoni, S. (2005). The limits to specialization: Problem-solving and coordination in modular networks. *Organization Studies* 26, 12, 1885-907.

Choudary, S. P. (2015). Platform scale: How an emerging business model helps startups build large empires with minimum investment. *Platform Thinking Labs*.

Cusumano, M. A., & Gawer, A. (2002). The elements of platform leadership. *MIT Sloan management review*, 43, 3, 51-58.

Dargay, J., Gately, D., & Sommer, M. (2007). Vehicle ownership and income growth, worldwide: 1960-2030. *The Energy Journal*, 28, 4, 143-170.

Deci, E. L. (1971). Effects of externally mediated rewards on intrinsic motivation. *Journal of Personality and Social Psychology*, 18, 1, 105-115.

Deci, E. L., & Ryan, R. M. (1985). *Intrinsic motivation and self-determination in human behavior*. New York: Plenum.

Dubois, A., & Gadde, L-E. (2002). Systematic combining: An abductive approach to case research. *Journal of Business Research*, 55, 7, 553-560.

Easton, G. (2010). Critical realism in case study research. *Industrial Marketing Management*, 39, 1, 118-128.

Eisenhardt, K. M. (1989). Building theories from case study research. *The Academy of Management Review*, 14, 4, 532-550.

Eisenmann, T., Parker, G., & Van Alstyne, M. (2006). Strategies for two-sided markets. *Harvard Business Review*, 84, 10, 92-101.

Eisenmann, T., Parker, G., & Van Alstyne, M. (2011). Platform envelopment. *Strategic Management Journal*, 32, 12, 1270-1285.

Eriksson, P., & Kovalainen, A. (2008). *Qualitative Methods in Business Research*. Sage. London, England.

Evans, D. S. (2003). The antitrust economics of multi-sided platform markets. *Yale Journal on Regulation*, 20, 2, 325-82.

Evans, D. S., Hagiu, A., & Schmalensee, R. (2006). *Invisible engines: How software platforms drive innovation and transform industries*. MIT Press. Cambridge, MA, USA.



Evans, P. C., & Gawer, A. (2016). The rise of the platform enterprise: A global survey. The Center for Global Enterprise.

Gartner Research (2003). Understanding Gartner's hype cycle. [Assessed 20 February 2019].

Garud, R., Jain, S., & Tuertscher, P. (2008). Incomplete by design and designing for incompleteness. *Organization Studies*, 29, 3, 351–371.

Gawer, A. (2009). *Platforms, markets and innovation*. Edward Elgar Publishing. Northampton, MA, USA.

Gawer, A. (2014). Bridging differing perspectives on technological platforms: Toward an integrative framework. *Research Policy*, 43, 7, 1239-1249.

Gawer, A., & Cusumano, M. A. (2002). *Platform leadership: How Intel, Microsoft, and Cisco drive industry innovation*. Harvard Business School Press. Boston, MA, USA.

Gawer, A., & Cusumano, M. A. (2008). How companies become platform leaders. *MIT Sloan management review*, 49, 2, 28-35.

Gawer, A., & Cusumano, M. A. (2014). Industry platforms and ecosystem innovation. *Journal of Product Innovation Management*, 31, 3, 417-433.

Gawer, A., & Henderson, R. (2007). Platform owner entry and innovation in complementary markets: Evidence from Intel. *Journal of Economics and Management Strategy* 16, 1, 1-34.

Hagiu, A. (2006). Merchant or Two-sided platform? *Review of Network Economics*, 6, 2, 115-133.

Hagiu, A. (2014). Strategic decision for multisided platforms. *MIT Sloan Management Reivew*, 55, 2, 71-80.

Hagiu, A., & Wright, J. (2013). Do you really want to be an eBay? *Harvard Business Review*, 91, 3, 103-108.

Hagiu, A., & Yoffie, D. B. (2009). What's your Google strategy? *Harvard Business Review*, 87, 4, 74–81.

Harackiewicz, J. (1979). The effects of reward contingency and performance feedback on intrinsic motivation. *Journal of Personality and Social Psychology*, 37, 1352-1363.

Hertel, G., Niedner, S., & Herrmann, S. (2003). Motivation of software developers in Open Source projects: An Internet-based survey of contributors to the Linux kernel. *Research Policy*, 32, 7, 1159-1177.

Hietanen, S. (2014). Mobility as a Service – the new transport model. *ITs & Transport Management Supplement*, 12, 2.

Holmberg, P., Collado, M., Sarasini, S. & Willander, M. (2016). Mobility as a Service – MaaS. Describing the framework. Victoria Swedish ICT AB. [Accessed on 01 June 2018].

Hsieh, H-F., & Shannon, S. E. (2005). Three approaches to qualitative content analysis. *Qualitative Health Research*, 15, 9, 1277-1288.

Jiao, J. R., Simpson, T. W., & Siddique, Z. (2007). Product family design and platform-based product development: A state-of-the-art review. *Journal of Intelligent Manufacturing*, 18, 1, 5-29.

Kamargianni, M., & Matyas, M. (2017). The Business Ecosystem of Mobility as a Service. 96th Transportation Research Board Annual Meeting, Washington DC.

Kamargianni, M., Li, W., Matyas, M., & Schäfer, A. (2016). A critical review of new mobility services for urban transport. *Transportation Research Procedia*, 14, 3294-3303.

Kenney, M., & Zysman, J. (2016). The rise of the platform economy. *Issues in Science and Technology*, 32, 3, 61-69.

Koch, S., & Kerschbaum, M. (2014). Joining a smartphone ecosystem: Application developers' motivations and decision criteria. *Information and Software Technology*, 56, 11, 1423-1435.

König, D., Eckhardt, J., Aapaoja, A., Sochor, J., & Karlsson, M. (2016). Deliverable 3: Business and operator models for MaaS. MAASiFiE project funded by CEDR.

Lakhani, K. R., & von Hippel, E. (2003). How open source software works: "Free" user-to-user-assistance. *Research Policy*, 32, 6, 923-943.

Lakhani, K. R., & Wolf, R. G. (2003). Why hackers do what they do: Understanding motivation and effort in Free/Open Source Software projects. MIT Sloan Working Paper No. 4425-03.

Lerner, J., & Tirole, J. (2002). Some simple economics of open source. *Journal of Industrial Economics*, 50, 2, 197-234.

Parker, G. G., & Van Alstyne, M. W. (2005). Two-sided network effects: A theory of information product design. *Management Science*, 51, 10, 1494-1504.

Parker, G. G., & Van Alstyne, M. W. (2017). Innovation, openness, and platform control. *Management Science*, 64, 7, 1-18.

Parker, G. G., Van Alstyne, M. W., & Choudary, S. P. (2016). Platform revolution: How networked markets are transforming the economy--and how to make them work for you. W.W. Norton & Company. New York, NY, USA.

Porch, C., Timbrell, G., & Rosemann, M. (2015). Platforms: A Systematic Review of the Literature Using Algorithmic Historiography. ECIS 2015 Completed Research Papers. Paper 143.

Roberts, J. A., Hann, I.H., & Slaughter, S. A. (2006). Understanding the motivations, participation, and performance of Open Source Software developers: A longitudinal study of the Apache projects. *Management Science*, 52, 7, 984-999.

Rochet, J. C., & Tirole, J. (2003). Platform competition in two-sided markets. *Journal of the European Economic Association*, 1, 4, 990-1029.

Rochet, J. C., & Tirole, J. (2006). Two-sided markets: A progress report. *The RAND Journal of Economics*, 37, 3, 645-667.

Rubin, H. J., & Rubin, I. S. (2012). *Qualitative interviewing: The art of hearing data*. Third edition. Sage Publications, Thousand Oaks.

Ryan, R. M. (1982). Control and information in the intrapersonal sphere: An extension of cognitive evaluation theory. *Journal of Personality and Social Psychology*, 43, 3, 450-461.

Ryan, R. M., & Deci, E. L. (2000). Intrinsic and extrinsic motivations: Classic definitions and new directions. *Contemporary Educational Psychology*, 25, 1, 54-67.

Ryan, R. M., & Grolnick, W. S. (1986). Origins and pawns in the classroom: Self-report and projective assessments of individual differences in children's perceptions. *Journal of Personality and Social Psychology*, 50, 3, 550-558.

Saunders, M., Lewis, P., & Thornhill, A. (2009). *Research methods for business students*. Fifth edition. Pearson Education Limited. Essex, England.

Schilling, M. (2000). Toward a general modular systems theory and its application to interfirm product modularity. *The Academy of Management Review*, 25, 2, 312-334.

Simpson, T. W. (2004). Product platform design and customization: status and promise. *AI EDAM: Artificial Intelligence for Engineering Design, Analysis and Manufacturing*, 18, 1, 3-20.

Skinner, E., A., Wellborn, J. G., & Connell, J. P. (1990). What it takes to do well in school and whether I've got it: A process model of perceived control and children's engagement and achievement in school. *Journal of Educational Psychology*, 82, 1, 22-32.

Stevenson, H., & Moldoveanu, M. (1995). The power of predictability. *Harvard Business Review*, 73, 4, 140-143.

Tapscott, D., & Williams, A. (2006). *Wikinomics. How mass collaboration changes everything*. New York, NY: Portfolio (Penguin Group).

Teece, D. J., Pisano, G., & Shuen, A. (1998). Dynamic capabilities and strategic management. *Strategic Management Journal*. 18, 7, 509-533.

Thomas, L. D., Autio, E., & Gann, D. M. (2014). Architectural leverage: putting platforms in context. *The Academy of Management Perspectives*, 28, 2, 198-219.

Tiwana, A. (2013). *Platform ecosystems: Aligning architecture, governance, and strategy*. Morgan Kaufmann, Waltham, MA, USA.

Tiwana, A., Konsynski, B., & Bush, A. (2010). Platform evolution: coevolution of architecture, governance, and environmental dynamics. *Information Systems Research*, 21, 4, 675-687.

United Nations (2017). *World population prospects: The 2017 revision*. [Accessed on 01 May 2018].

Van Alstyne, M. W., Parker, G. G., & Choudary, S. P. (2016). Pipelines, platforms, and the new rules of strategy. *Harvard Business Review*, 94, 4, 54-62.

Von Krogh, G., Haefliger, S., Spaeth, S., & Wallin, M. W. (2012). Carrots and rainbows: Motivation and social practice in open source software development. *MIS Quarterly*, 36, 2, 649-676.

Wheelwright, S. C., & Clark, K. B. (1992). Creating project plans to focus product development. *Harvard Business Review* 70, 2, 67-83.

Woodside, A. G., & Wilson, E. J. (2003). Case study research methods for theory building. *Journal of Business and Industrial Marketing*, 18, 6/7, 493-508.

Yin, R. K. (2003). *Case Study Research: Design and Methods*. SAGE Publications.

# APPENDICES

## APPENDIX 1: INTERVIEW GUIDE FOR IN ENGLISH

### INTERVIEW GUIDE

#### INTRODUCTION

Introduce myself and the purpose of the thesis

Ask permission to record the interview and explain autonomous and confidentiality terms

#### PROFILE

Could you briefly tell about yourself and your organization?

What are your position and responsibilities in relation to Mobility-as-a-Service?

#### COMMON QUESTIONS

1. How do you see the future of urban transportation?
2. What do you think about the concept Mobility-as-a-Service (MaaS)?

*Mobility-as-a-Service (MaaS) is a user-centric, intelligent mobility distribution model in which all mobility service providers' offerings are aggregated by a sole mobility operator and supplied to users through a single digital platform. Therefore, MaaS can be viewed as a larger higher-level platform, that consists of several smaller connected platforms or micro-entities to form an open innovation ecosystem. Both public and private sector actors can participate to create innovative mobility solutions (Kamargianni & Matyas, 2017).*

*One example of a MaaS operator is the Whim app by MaaS Global in Helsinki. MaaS can extend to added service such as food and groceries delivery to provide a complete service offering to end- users.*

#### PLATFORM PROVIDER (MAAS GLOBAL)

3. What is the business model of MaaS Global (Whim app)?
4. Who are the current service providers on Whim? Who might be future service providers?
5. What is your vision for future development of MaaS Global?

### **PLATFORM CONTRIBUTORS (TRANSPORT SERVICE PROVIDERS)**

3. What role does your organization would play within a MaaS ecosystem?
4. What would encourage you/your organization to join a MaaS platform? What would not? Why?
5. What are the decisive factors to consider when you decide whether or not to join a MaaS platform? Why?