Service concept development in the transport industry – VR Group

Patrik D'Arcy

28 November 2017

Abstract

Haaga-Helia

28 November 2017

Author(s) Patrik D'Arcy	
Degree programme International Business (GloBBA)	
Report/thesis title How should VR approach developing a service for a rapidly changing market?	**Number of pages and appendix pages** 26 + 21

Mobility as a service (often abbreviated as "MaaS") is a service concept in which different forms of transportation are combined under one system or interface. For example, the mobile app Whim in Helsinki, Finland allows users to use public transport and have a set quota of taxi fares they can use, all for cheaper than if paid for individually.

This thesis presented a case for the viability of MaaS systems in the near future by benchmarking different, recent MaaS trials from around Europe. Companies with a vested interest in the transport industry were asked for their input on what they want to see in the near future concerning MaaS. In addition, a selection of candidates from the general public were asked for their opinions on MaaS, as well as ideas for how to improve upon current public transport offerings in Finland. Current MaaS systems were benchmarked in order to gain a better understanding of how they work and how successful they are.

Mixed method research involving an interview, a questionnaire, and benchmarking was conducted, and the results of the research indicate that there is significant demand for MaaS and combined transport in Finland. Both consumers and businesses are interested in what the future holds. It is recommended that VR cooperate generously and actively with other service providers in the transport industry, and do so through an interface such as a smartphone app.

The functionality of a MaaS app in Finland must include payment functionality through either ticketing, billing, or direct purchases – ideally all of the above. According to benchmarking results, the most popular and most successful business models and apps have the most robust and most widespread functionality, working across entire countries and offering as many different modes of transport as possible.

Keywords
Mobility as a service, VR, service concept development, mixed method research.

Table of contents

1 Introduction

The purpose of this chapter is to acquaint the reader with the topic of this thesis – mobility as a service and using it to develop service concepts in the transport industry. The background of the legislation and the business idea will be explained in order to give a better idea of why the topic and timing of the proposed case is relevant.

1.1 Background

In mid-2017, towards the end of the summer, the Finnish Government voted to open the passenger rail market to free competition. The plan goes into effect in the 2020s, with VR being able to compete amongst potential newcomers to the market. The legislative change is large and significant in Finnish history, in a country fairly well-known for tight government-controlled monopolies and legislation (Nanny State Index 2017). According to Minister of Transport and Communications Anne Berner, the aim of the reform is to encourage passenger rail operators to be more responsive to customer demands and requests, develop and improve service quality, and increase the amount of passenger rail transport, as well as the share of rail transport compared to other passenger transport methods. Put simply, passenger comfort and approval rates should improve, fare competition should increase, and prices should fall. (Finnish Ministry of Transport and Communications 2017.)

Facing this significant change in legislation and the market, VR is seeking to develop new and innovative methods in rail transport (VR Group 2017). This in turn presents the research problem for the thesis – How should VR approach developing a service for a rapidly changing market?

This thesis looks at different ways transport methods can be combined - such as rail, road, and other public transport – how different versions and implementations have worked in Finland and abroad, and how potential, current, and past users perceive the services. The research will also attempt to gauge potential public interest in various different types of services, and service design concept recommendations will be made based on feedback and the results from the research.

Mobility as a Service, or MaaS (used interchangeably throughout the thesis), is a concept of modelling traffic and transport services based on the needs of customers. Put simply, the aim is to enable customers to efficiently travel around the country without the need for a private car. The proposal passed in various phases between 2016 and 2017. (Finnish Ministry of Transport and Communications 2017.)

MaaS already exists in the form of trials in some European countries already, with Vienna Pass in Vienna and Qixxit by Deutsche Bahn across Germany, as well as Hannovermobil in Hannover. In addition, the current public transport system in place in the Helsinki metro area in Finland is fairly similar to purported MaaS systems elsewhere. Due to the the case company's familiarity with the Helsinki metro area, it is not further discussed in this thesis.

MaaS Finland was the first company founded solely for the purpose of providing and developing MaaS systems in Finland. The business model most MaaS systems use is offering travel options for a given journey and in return charging a monthly fee. What the end user ideally experiences (or the intention) is a smartphone interface that allows a user to input their intended route or destination, from which the system offers the travel options. (MaaS Global 2017).

1.2   Key Concepts

Shared mobility is defined as the shared use of a vehicle, bicycle, or other mode of transportation. It is meant to allow a potential user quick, short-term use of a mode of transportation on an as-needed basis. (Shaheen, Chan, Bansal & Cohen 2015, 3.) Multiple publications and sources have called the concept of shared mobility a megatrend (Basle, 2016; Karim, 2017; Singh, 2015). A 2016 estimate of registered European car sharing services put the number of users at 14 million by 2021. 10% of these users are purported to be frequent users, using the services multiple times a month. (Basle 2016.)

In 2015, the car sharing industry generated 650 € million in revenue. The North American, European, and Asia-Pacific regions respectively had 1.5 million, 2.1 million, and 2.3 million users. North America has 22,000 vehicles in use, while Europe had 31,000 and Asia-Pacific 33,000. (Bert, Collie, Gerrits & Xu 2016.)

A **sharing economy**, also called a peer economy, is a term used to generally define the concept of renting one's goods or services directly for others to use. It allows users to obtain goods or services cheaper than through regular means from companies. The consumer peer-to-peer rental market is purportedly worth $26 billion. (The Economist 2013.)

Liikennekaari is a legislation package that aims to open the transport markets in Finland to competition. The process of changing market legislation and removing artificial monopolies has been slow (Helsingin Sanomat 2016). The Finnish government has a history of tightly controlling all markets in the country, and held monopolies in many industries for decades – not unlike other northern European countries (EU Business 2013).

This legislation concerning traffic and transport services (liikennepalvelulaki, lit. "transport service legislation") intends to consider the transport sector as a singularity in order to ease market entry for new services and companies, as well as increase flexibility between different transport systems. (Finnish Ministry of Transport and Communications 2017.)

On a broader scale, the aim of the legislation is to privatise railroads in Finland, open the transportation markets up to more competition, and forfeit the quota and price roof systems in place in the national taxi system. It also allows pseudo-taxi companies like Uber and Lyft to enter and compete on common ground. (Finnish Ministry of Transport and Communications 2017.)

Public transport is a system of vehicles, such as trains, buses, or other road and rail transport, that operate at regular times via fixed routes, and are used by the general public (Cambridge Dictionary 2017).

Transportation as a Service is the concept of leasing out one's private vehicle (e.g. car, bicycle) for public use. As an example, the average car owner in the United States spends roughly 10% of their day driving; the aim of this concept is to capitalise on the time lost. (Forbes 2016.)

Traffic congestion is when road capacity expands in such a way that speed, convenience, and even health are affected negatively. Traffic jams are most common in cities, where creating solutions for mounting congestion is a common and costly issue for many. (UK Essays 2017.)
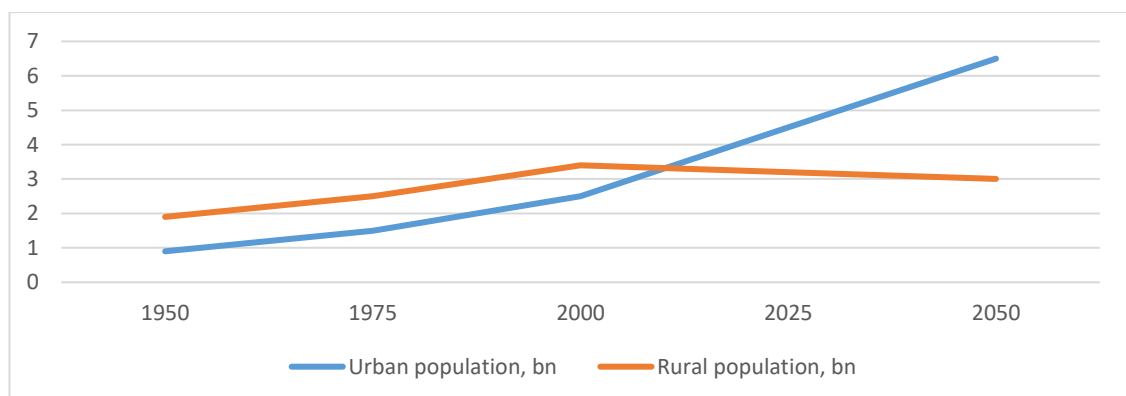

Figure 1. Urban and rural population in the world, 1950-2050 (United Nations 2014)

According to a UN report on urbanisation, 30% of the world's population lived in urban population centres, and by 2050, this figure is projected to rise to 66%. Additionally, the

global rural population is expected to hit its peak soon, and should begin to decline. As urbanisation increases, sustaining development becomes more challenging, and this is especially true when it comes to urban planning and expansion (United Nations 2014).

As urbanisation increases, the number of cars in cities increases in conjunction with the number of people. Owning a car has a strong effect on the choices people make when deciding what type of transport to use (i.e. people would rather drive than take a bus). More people that own cars means more congestion in cities, which in turn creates more pollution, lower quality of health and life, etc. Jane Jacobs (1961, 369) was one of the first people to make the case for a system in which public transportation systems are combined and integrated with private services, including private cars. She purported that it might be the best solution to urbanisation.

1.3 Commissioning company

VR (Finnish abbreviation for "Valtion Rautatiet," literally national or government railways), officially VR Group, is the national rail company in Finland. They retain a monopoly position on personal rail transport in the country, and have done so since its inception in 1862. Finland has the highest approval rate for rail and train transport in Europe. (European Commission 2016.)

VR is entirely owned by the state of Finland, and operates trains not only in Finland but also in countries such as Sweden and Russia. The company employs around 8000 people, and its operating revenue was 1.19€ billion in 2016. (VR Group 2017.)

According to VR's 2016 annual report, 43% of the company's revenue in 2016 came from passenger rail. Passenger rail transport made up 5% of total Finnish passenger transport in 2015, with logistics rail transport at 29% in 2016. VR's revenue has been slowly declining since 2012, with 1.44€ billion in 2012 compared to 1.19€ billion in 2016. (VR Group 2017.)

1.4 Research questions

This topic is of importance to VR because the government-mandated artificial monopoly is coming to an end in the next decade. The rail market has been controlled by the government since its inception, much like other European countries. As of 2017, only three countries in the EU have a single service provider in the rail market – Finland, Ireland, and Luxembourg. (Finnish Ministry of Transport and Communications 2017.)

Based on the research question, the following investigative questions have been formulated.

Table 1. Overlay matrix

Investigative Questions	Theoretical Framework	Result
1. How viable is MaaS in Finland?	Customer orientation, service design, concept development	Data analysis, research
2. Experiences and expectations for future MaaS systems in Finland?	Liikennekaari, congestion, "peak car," shared mobility megatrend	Questionnaires, interview, data analysis, research
3. Experiences of trial users of current and past users of MaaS in Europe?	Combined method research, questionnaires	Benchmarking, data analysis, research

This thesis aims to establish the need and interest for combining different forms of transportation in Finland. In order to do so, the thesis compares and contrasts similar systems and trials that have been completed in other countries, such as Vienna PASS in Vienna, Austria. In addition, a questionnaire was sent out to the general public, as well as an interview to companies that have a vested interest in, or are actively involved in, the transport industry.

Much like what websites like Momondo base their business on, the concept of developing a system which offers a complete and customisable transportation or travel package to a potential customer seems interesting to many (The Economist 2016).

1.5   Demarkation

The focus within this body of work stays on the potential service in question, as well as the potential consequences for VR's business per the aforementioned legislation and public and private interest. The thesis focuses on public transport due to VR's vested interest and specialisation in rail. Suffice it to say that the legislation by extension will also apply to other forms of transportation, such as the taxi industry, and will affect all aspects of public and private transportation in Finland. (Helsingin Sanomat 2017.)

Limited focus is brought to other forms of transportation, as well as certain customer and interest groups. The thesis serves primarily as an early or initial review of the possibilities that the new legislation and changing market structure brings to Finland. The legal aspect of the new legislation is covered in the introductory section; due to the nature of the thesis' focus on service concept development, and seeing as how customers are the basis for

the research being conducted, aspects such as authorities and their role in the new legislation have been demarkated. A customer-based focus is more important in terms of an initial review and pre-planning for innovative service concepts (Keller 2001, 17).

MaaS trials and systems in place in other countries are compared with potential models that might be implemented in Finland. This is done to gauge the size and scope of the systems, and to see how realistic a successful MaaS system might be in Finland.

Whim is a MaaS trial currently underway in Finland. It is the only large-scale MaaS system in Finland that is being tested, and while it would have been a good candidate to benchmark against other MaaS systems, it is not in wide enough use to be of enough significance with regard to the purposes of this thesis (Google Play Store 2017).

VR faces a big change in their market, so having some sort of research-based idea of what to do and what to avoid should help them in the short run. An innovative theoretical business model will benefit the company, business clients, and regular consumers (Breiby & Wanberg 2011, 18). Consumers and investors will see VR's new offering, and confidence in the company will be retained. Businesses will be faced with new opportunities for contracts from VR – e.g. an app might need to be developed for the new business model, and software/hardware infrastructure will need to be developed to handle it.

2   Research Theory & Methodology

A theoretical framework is the starting point in which potential themes and concepts within the thesis are clarified and explained within the framework of the research. In this particular context, the framework will be used to explain the research used, including the methodology and theory. (University of Southern California 2017.)

The theories and framework outlined serve as the basis for conducting research and benchmarking of MaaS systems in order to provide insightful information for the commissioning company.

2.1   Service design and concept development

Developing service concepts stems from a need to find innovative and unique ways to sell and compete with other companies. As a given industry moves towards increasing competition, customer demands change, and the market can shift rapidly. In order to stay relevant, companies must develop ways to make the most of their current customers, and find better methods of understanding new potential customers. (Turunen 2008.)

Service concepts are a significant part of designing and developing new and innovative services. Service concept development, much like Mobility as a Service, is a fairly new topic. It hasn't been discussed or used much outside of academic purposes. Developing a concept for a service design can help expand and flesh out the functionality of the service better and more efficiently, and can help bring out the details in order to gain a better understanding of the underlying framework. (Goldstein, Johnston, Duffy & Rao 2002, 122.)

2.2 Customer orientation

A customer-oriented business strategy is defined as a set of rules or goals set by a company in order to drive its sales and services to primarily consider client and customer needs (Business Dictionary 2017). A customer-oriented company does its best to retain client satisfaction at the top of its list, with front-line customer service, service workers, and sales representatives often having a significant effect on the perception of the company from the viewpoint of the customers. (Chron 2017.)

For example, the United Postal Service went from being operations-oriented – a strategy highly dependent on company and employee efficiency – to customer-oriented in the 1980s. Part of the reason for this significant change was increased market competition, which forced UPS to quickly change and adapt to a rapidly changing and moving market. (Chron 2017.)

The UPS case draws many parallels with the topic of this thesis, in which VR faces a rapidly changing market which is about to change significantly in terms of competition. Companies facing significant market forces and large shifts in the status quo must develop new products and services in order to stay relevant, and retaining a customer-oriented strategy allows a company to focus on and listen to what customers want, rather than deciding what the customers should want (Bielaszka-DuVernay 2008).

2.3 Benchmarking

Benchmarking can be defined as a method of finding the best performing and most successful parts of a given point of comparison. For example, a company might compare the products and services it offers with other, similar offerings from competitors and other companies (Stroud 2017). It will then use the results of the comparison to develop and improve its own methods (Collins 2017).

The benefits of benchmarking are far-reaching, and can help a company quickly gain perspective on competitors and the market situation. Among other things, benchmarking can

help companies compare themselves to the competition, allow them to prioritise aspects of their products or services to better compete, and monitor competition and change in the market. Because benchmarking involves data collection in real-world situations, it promotes development and discussion that is based on hard data and evidence, rather than assumed information. (Ward Group 2017.)

Benchmarking can be an effective tool that allows companies to prioritise their service development; It can give a company a significant strategic advantage if used well (McMahon 2016). Given the rail market in Finland will become unpredictable and is subject to significant change in the near future, benchmarking service concepts and service design now rather than later could be an important factor in allowing VR to get a head start on the competition in the rail market of the near future.

3   Research Methods

The objective of the research is to receive answers through interviews from at least five different company representatives from different companies. In terms of the quantitative approach, the aim was conduct a large-scale questionnaire to get the most widespread variety of answers from potential future users of MaaS systems in Finland. These concerned the viability and interest in MaaS in general, as well as general input on the wants and needs of customers. For this, the aim was to gather at least a few hundred responses to gain a valid sample.

The research for this thesis is a mixed method type. The investigative questions are answered via an interview sent out to both transport industry representatives (e.g. different representatives from interested parties such as HSL, VR, Onnibus, Lähitaksi, Taksi Helsinki, etc.) as well as a questionnaire to potential future consumers on how they feel about the concept of MaaS, in addition to how likely it would be that they would use a service like Whim mentioned previously. In addition, the experiences of customers using already implemented MaaS systems across Europe were benchmarked and taken into consideration when forming suggestions for VR.

Mixed method research is defined as conducting research that, contrary to traditional methods, combined quantitative and qualitative research through collecting and analysing data (Foodrisc 2017). Due to the conceptual and novel nature of the subject matter, mixed method research is the most appropriate method. Both open-ended research and responses from customers as well as close-ended information were needed in order to obtain a full spectrum of data for analysis.

A mixed method is the best type of research for this topic because both a large volume of answers, and anecdotal data and lengthy answers are required from participants. In the interest of time and efficiency, this is the best solution.

The research involving comparing and contrasting information and experiences with other, similar service concepts is generally referred to as benchmarking, a method in which the quality of something (in this case a business concept) is measured by comparing it against another, similar concept. It is also known to be used as a way of setting a standard by which one can compare and improve upon one's own work. (Cambridge Dictionary 2017.)

The reason for the combined quantitative and qualitative approach was that the topic was more easily approached from the perspective of people and companies who are or will be investing, and be interested in, the business model; a mixed method allowed for the benefits of both quantitative and qualitative research, while minimising the downsides of each (Foodrisc 2017). It would have been difficult to conduct research from a quantitative perspective because the topic is still highly conceptual, which is why a combined approach was a good compromise.

The risk with the chosen data collection methods was not getting enough responses, both in regard to the questionnaire meant for hundreds of responders, as well as the highly qualitative interviews. Since the topic relied more heavily on the quantitative answers, this was a more important aspect to get right, and thus posed a bigger risk in terms of not getting enough data.

In terms of ethics and professional integrity, the process and planning of the thesis was taken seriously and done professionally, working together with the thesis coordinators and the commissioning company. All aspects of the thesis were done from as objective a point of view as possible in order to retain professional integrity. The thesis details in all honesty mistakes that were made and potential improvements for the future in order to remain transparent.

3.1 Questionnaire and Interviews

The questionnaire and interviews were designed with the principles of a mixed method in mind. The interview and questionnaire questions are similar to one another (both are attached as appendices), but they were tailored for both the type of answers required (short

vs. long, qualitative vs. quantitative) and the intended audience. The interview questions are more in-depth and more relevant to the research topic because more assumptions can be made about interviewees; All are in the transport industry and thus are more aware of the circumstances of the research, as well as the topics of mobility and MaaS.

Questionnaire questions were a mixture of Likert scale-type, simple concepts that allowed respondents to directly indicate how they feel about the relevant subject material, long-answer, and short-answer questions. The Likert scale involves survey questions that give the responder a range of answers, normally with a neutral option in the middle (Survey-Monkey 2017). For the purposes of more conclusive data, no neutral responses were given as a choice in the questionnaires. The questionnaires also included multiple-choice questions regarding the methods of transport used by the respondents daily, as well as the number of different types of transport used daily. A quantitative style ensures a higher volume of answers (American Intercontinental University 2012). The questionnaire was open online for four weeks.

For more concrete and qualitative results, open-ended questions were used to allow respondents to have some freedom in pitching ideas for future systems, and making complaints about the current system. The interview questions were also designed to be qualitative and to allow for as much information as possible.

3.2   Benchmarking

There are thousands of reviews for the services and individual apps in use in MaaS systems across Europe – for example, the German version of Qixxit, a MaaS-based service and app, has over 2000 individual user reviews on Google's Play Store. The Google Play Store is a repository and marketplace for smartphone apps built for phones that run Android – the most popular mobile operating system in the world (Google 2017). Due to Android's significant market position, the thesis focused on apps solely from it, and did not include reviews of similar or identical apps on Apple's App Store, built for iOS – the main competitor to Android (Apple 2017).

In some cases, much more information was available regarding a given service or app. In these cases, the information was included in the results and used to develop a more in-depth analysis.

Customers using MaaS-based apps are on the cutting edge of the MaaS model, and thus have a vital perspective concerning how they function, whether they work or not, and if they are realistic and might be successful on a much larger scale.

Benchmarking was conducted by sampling a valid number of reviews and responses of MaaS trial apps, systems, and services. The averages were weighted on a scale of 1 to 5 where possible (e.g. Google Play Store reviews of apps), and compared. The results of the comparison were then used to determine which apps or services performed the best, what customers felt were the best and worst parts of the systems, and what could be improved upon. These results will be used to develop recommendations for the commissioning company.

When benchmarking review scores and content, word frequency was an effective tool for determining the general perception of a given topic (Oer 2013, 1). While researching word frequency in reviews, several details were omitted to reduce redundancy and increase clarity. Conjunctions, prepositions, and articles were left out of the word frequency calculations (e.g. "on", "in", "at", "for", "ago", "before", etc.). Words that are inherently based on the structure of the various review systems were delimited, such as the days and dates of the reviews, words such as "review" or "contributor", and other words and phrases that are not reflective of the content of the reviews themselves. In each category, the aim was to list the 30 most frequent words where applicable. As mentioned previously, some apps do not have enough reviews, and thus the decision was made to leave out the word frequency entirely when the results would have been inconclusive.

4 Results

Both the public and business questionnaires were open for answers for roughly four weeks, with the vast majority of answers given in the first couple of days. The public questionnaire was shared with roughly 3000 people via social media and digital distribution methods such as instant messaging, and the business questionnaire was sent to 25 different companies concerned with transport in Finland. The full results of both questionnaires are available in attached appendices at the end of the thesis, including open-ended answers and feedback.

4.1 Questionnaire responses and analysis

A total of 72 responses were given in the public questionnaire, most of which were given during the first few days the questionnaire was open for answers. Just under half of responders were aware of or knew about Mobility as a Service prior to the questionnaire.

Roughly three quarters of responders are in some form satisfied with public transport offerings in Finland currently. In response questions about different forms of combined transport and the concept's potential popularity in Finland, almost three quarters of responders said they wanted combined transport options. Three quarters also responded that they feel there is a demand for combined transport in Finland in general.

When questioned about the potential future of transport in Finland, most responders were positive concerning combined transport. While the majority of responders said they used only a single method of transportation on average daily (64.4%), over one-third used two or three. The most popular forms of transportation included local buses and trains, as well as personal cars. Easily the most popular type of payment and usage method according to responders was using an app or smartphone; fixed monthly payments and pay-as-you-go billing both got an equal number of answers.

4.2   Interview response highlights

Out of 25 potential companies, 5 responses were given in the business questionnaire. The responders included a large Finnish transport and car seller and importer, a Finnish bus and logistics company, a multinational transport service provider, and a multinational car rental company. All responders said they were aware of MaaS, as well as being at least somehow involved in developing and executing MaaS systems in Finland.

When asked about the future of MaaS in Finland, many responders wished for new legislation that would allow easier development and implementation of combined transport. Because MaaS is still a fairly new concept, some responders wished actual results and experiences with MaaS would increase in the near future. Among other things, notable wishes of the questioned companies concerning business partners and other companies included cheap prices, ease of use and implementation, open and free data, and general technological and economic cooperation.

4.3   Benchmarking reviews of MaaS systems

4.3.1   Vienna PASS

Vienna Pass is a service in Vienna, Austria. The service consists of a travel card (the Vienna Travelcard) that allows customers to travel across the city using a varied assortment of travel methods, including the metro, trams, buses and night-time buses, and the local S-Bahn train system, as well as allowing entry to an assortment of Viennese sights and

popular tourist spots. The pass is advertised as a single ticket to handle every travel network within the city, offering 24, 48, or 72-hour tickets.

Vienna Pass also advertises a companion app that customers can use to book bus rides, search offline maps, and generally customise one's trips in Vienna. Unlike other systems which use a monthly fee and generally operate more like an exclusive membership, Vienna Pass works more like a pay-as-you-go travel card. Similar examples of this can be found in Oyster cards in London, England, or the HSL travel pass in the Helsinki area in Finland. (Vienna Pass 2017.)
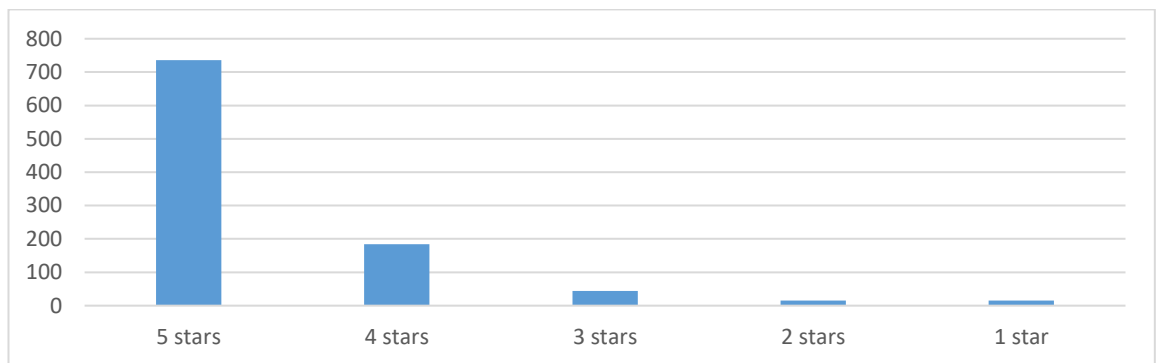
Figure 2. Variance of Trustpilot reviews for Vienna Pass (Trustpilot 2017)

According to TrustPilot reviews (which Vienna Pass advertises directly on their own website), since launching, the Vienna Pass had an average rating of 4.1 out of 5, based on 993 reviews as of October 2017. Over 90% of customers said that the convenience, value for money, and/or time saving factors were either good, very good, or excellent. (Vienna Pass 2017.)

The third most frequent word in TrustPilot reviews for Vienna Pass was "useful," also reflecting the positive reviews of the service.
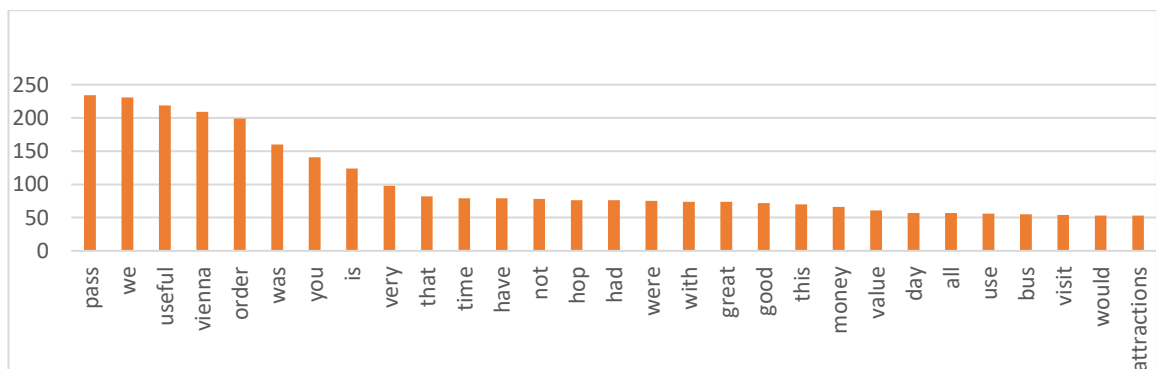

Figure 3. Word Frequency of Trustpilot Reviews for Vienna Pass (Trustpilot 2017)

Tripadvisor reviews for Vienna Pass were also very favourable, with an average review score of 4.5/5 out of a total of 323 reviews.
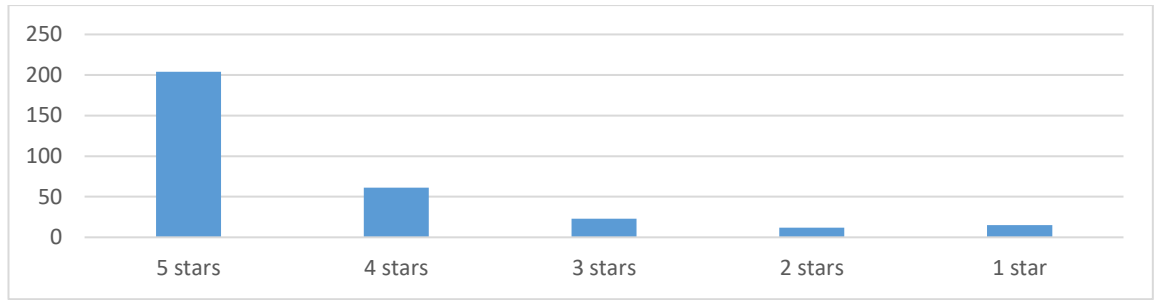

Figure 4. Variance of Tripadvisor reviews for Vienna Pass (Tripadvisor 2017)

Some of the most frequent words used in reviews were "bus", "hop", and "we", indicating that most users likely found the use of buses (and likely the "hop-on, hop-off"-style tourist buses) useful. "We" also indicated that many users used the service in smaller or larger groups, instead of alone.
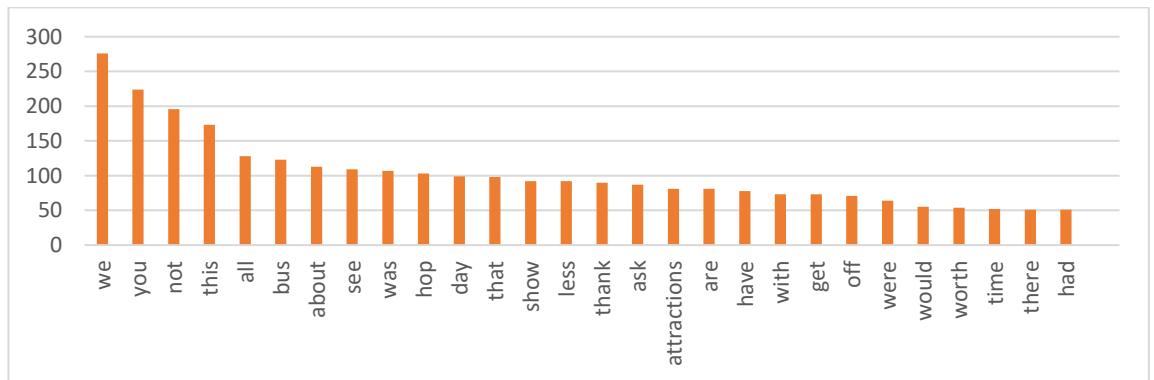

Figure 5. Word Frequency of Tripadvisor reviews for Vienna Pass (Tripadvisor 2017)

Vienna Pass had an average score of 4.3 out of 5 stars on Google's Business review platform, which allowed users to directly review websites, services, stores, and other points of interest (Google 2017).
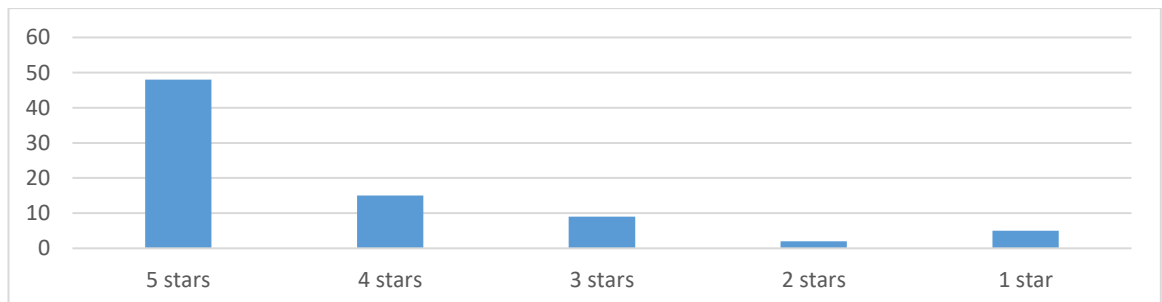

Figure 5. Variance of Google Business reviews for Vienna Pass (Google 2017)

Some of the most frequent words in Google Business reviews of Vienna Pass were "helpful" and "hop", which are similar to what was implied on other review platforms for Vienna Pass – many people found the service useful and helpful, in particular the buses and hop-on, hop-off nature of the tourist buses.
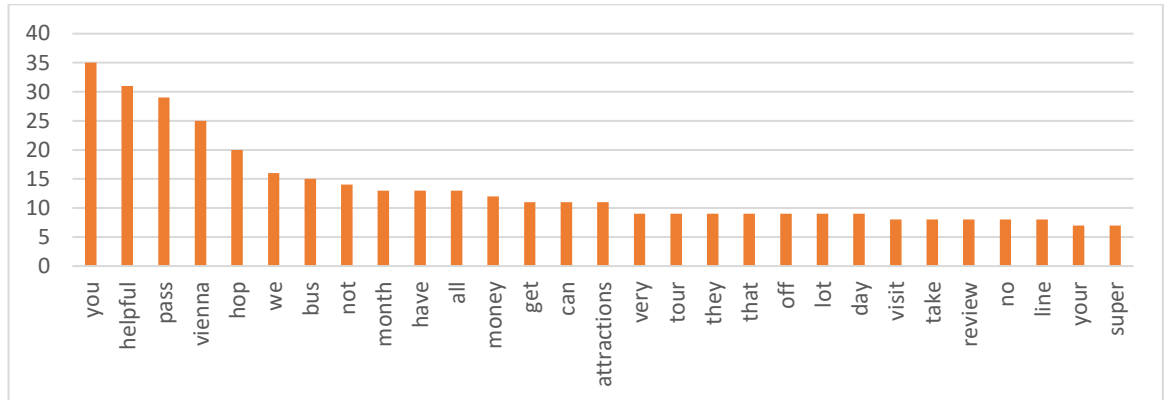

Figure 6. Word frequency of Google Business reviews for Vienna Pass (Google 2017)

4.3.2   Hannovermobil

The Mobility Shop was the one of the first working MaaS systems to be officially launched. Hannovermobil is the service that is offered via The Mobility Shop, marketed as a product amongst other offerings by the Greater Hannover Transport Association. First seen towards the end of 2014 with a limited pilot run, the service allows users to tailor different travel methods according to their needs, including buying tickets for public transport or booking a taxi ride in advance. Each travel method includes different options, such as travel times, that appear in real time. The service usage is billed in total at the end of each month. (Union Internationale des Transports Publics 2016.)

The monthly fee for Hannovermobil, Mobility Shop's "complete mobility package," is €9.95, and includes car sharing memberships as well as discounts towards taxi services and car sharing. Additional functionality and services can be added onto the monthly billing system. (Greater Hannover Transport Association 2017.)

Hannover's public transit system and the services provided by Hannovermobil are integrated into an app called GVH, available on the Google Play Store for Android devices like phones and tablets. The app had 1353 reviews total on the Google Play Store, with an average score of 3.1 out of 5 stars. The app had a significant amount of one-star reviews (380), which may be an indication of review bombing – a phenomenon wherein reviewers maliciously give low reviews in an act of protest (Kuchera 2017). The number is almost equal to the number of five-star reviews (440). While the actual number of reviews was

enough to give the average rating credibility, there were almost no reviews with text - less than 30. This means that analysing the content of text in the reviews would have been nullified by the fact that they only represented a significantly small margin of total reviews. (Google Play Store 2017.)
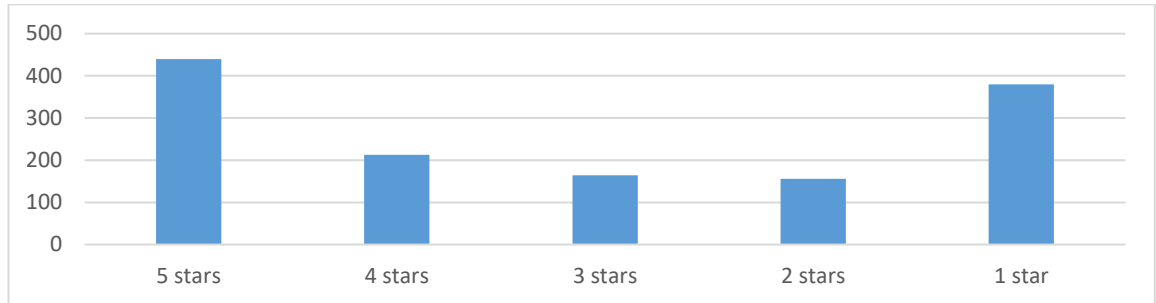

Figure 7. Variance of Google Play Store reviews for GVH (Google Play Store 2017)

4.3.3   Qixxit

Qixxit is a nationwide service provider that offers the best travel routes and methods for users in Germany. The company is a subsidiary of Deutsche Bahn AG, a German railway company. Deutsche Bahn was the world's biggest railway company by revenue in 2015. (Railway Technology 2017.)

Qixxit aims to simplify travel by providing a journey planner that shows the user different travel options by train, plane, bike, bus, and car. The app works across the entire country of Germany – a significant advantage when compared to other MaaS systems that are generally limited to just one or a few cities. The app implements social functions that allow users to share routes via different forms of social media, such as Facebook and WhatsApp. (Nets Sieger 2017.)
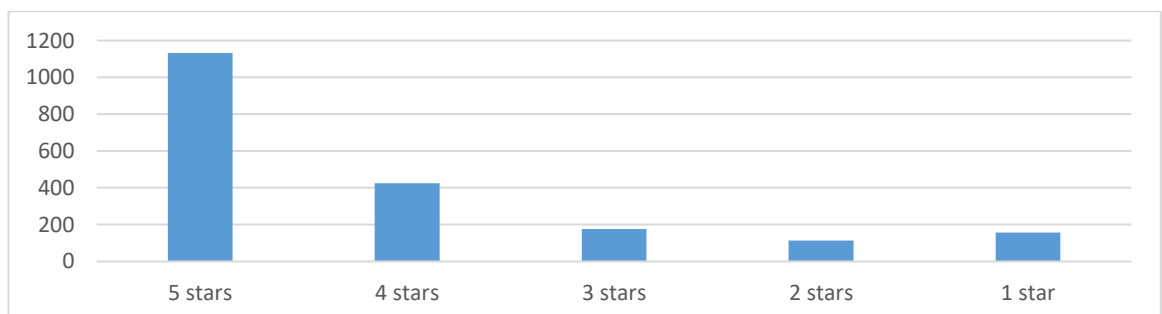

Figure 8. Variance of Google Play Store reviews for Qixxit (Google Play Store 2017)

Qixxit had a significant number of reviews on the Google Play Store (2007). The average rating for the app was 4.1/5, with slightly more one-star reviews than two-star. Reviews in

general seemed favourable, with some of the most frequent words used being "good" and "great". Despite the high number of total reviews, actual reviews with text were much less common (40). (Google Play Store 2017.)
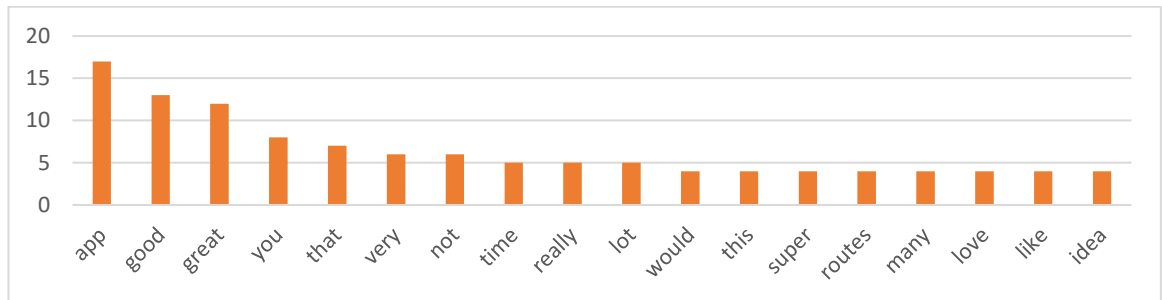

Figure 9. Word frequency of Goole Play Store reviews for Qixxit (Google Play Store 2017)

4.3.4 Moovel (International)

The international version of Moovel is a travel companion app available in 15 cities around the world – Austin, Amsterdam, Boston, Helsinki, Tampere, Turku, Oulu, Kiev, Lviv, Madrid, Oslo, Portland, Seattle, Sydney, and Vienna. The service functions simply as an interface to display travel information from A to B in the aforementioned cities. While the app itself doesn't have any sort of ticketing or billing functionality, the German equivalent of the app does. (Google Play Store 2017.)

Reviews, while smaller in number than other similar apps, were generally favourable. The average score was 4.0/5 and the total number of reviews stood at 376. (Google Play Store 2017.)
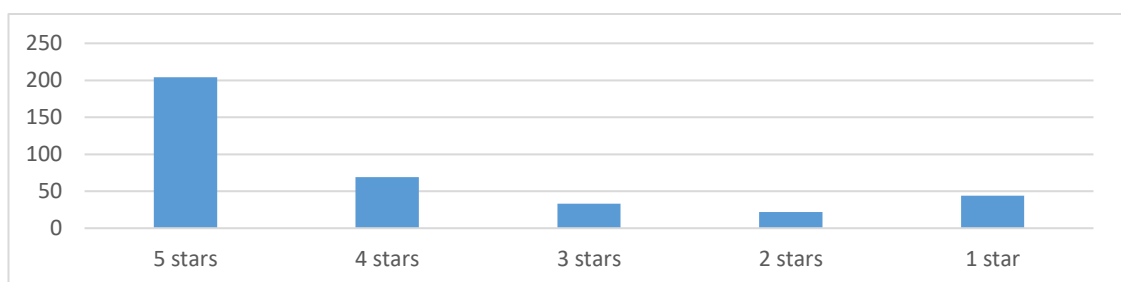

Figure 10. Variance of Google Play Store reviews for Moovel Global (Google Play Store 2017)

4.3.5 Moovel (German)

The German version of the Moovel app is a significantly more robust system compared to the international version. The app includes billing for carsharing provider Car2Go, integration with German taxi app MyTaxi, as well as billing and ticketing for Deutsche Bahn and

three other train and travel companies. In addition, the app offers integration for bikesharing services such as Nextbike, NorisBike, and Metropolitanrush. The map in the app displays available bikes in the user's local area, where applicable. (Google Play Store 2017.)

Google Play Store reviews for Moovel were generally mixed, with a total of 2206 reviews and an average review score of 3.7/5 – a worse average compared to the international version of the app, despite the far more robust and feature-rich nature of the German app. Additionally, there were a significant number of one-star reviews – 435 or almost 20% of all reviews. (Google Play Store 2017.)
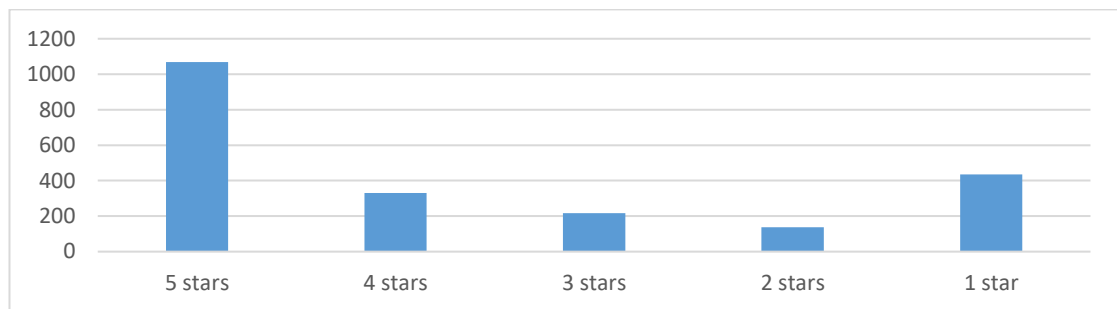

Figure 12. Variance of Google Play Store reviews for Moovel DE (Google Play Store 2017)

The word frequency in Moovel reviews were fairly inconclusive, with some of the most common words being "app", "not", "ticket", and "like", with "like" likely being the most positive word. (Google Play Store 2017.)
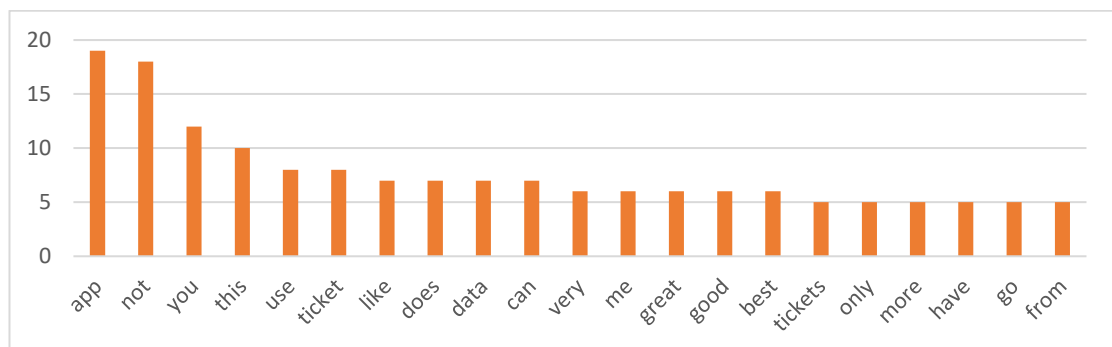

Figure 13. Word frequency of Google Play Store reviews for Moovel DE (Google Play Store 2017)

4.3.6 Tuup

Tuup is a fairly new app that functions as a journey planner for multiple cities across Finland. What separates Tuup from regular journey planners is it's integration with Kyyti – a ride-sharing service and app in and of itself that is in testing as of November 2017. Tuup

allows orders via Kyyti to be paid in-app. Kyyti itself is available in four cities in Finland – Helsinki, Oulu, Turku, and Tampere, and Tuup also functions as a travel companion and journey planner across the country. Tuup was named the most promising mobility startup in Europe in 2016. (Google Play Store 2017.)
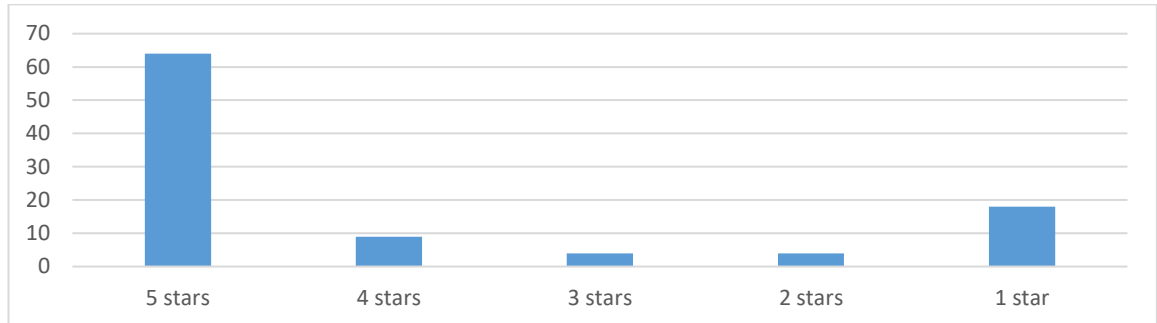

Figure 14. Variance of Google Play Store reviews for Tuup (Google Play Store 2017)

Reviews for Tuup were generally favourable, with total reviews standing at 100 at an average score of 4.0/5. The small number of reviews means text analysis of the reviews would have been inconclusive.

4.3.7 Perille

Perille is a Finnish app that, much like Tuup, functions as a journey planner for effectively the entire country of Finland. Perille boasts robust journey planner functionalities that are similar to what German app Moovel has, with almost all methods of transport, including specific companies and service providers, available. While the app doesn't include payment or billing functionalities, the app is built in a way that makes buying tickets and paying for services directly from the providers as easy as possible by providing a link to the provider's website directly, once the appropriate journey has been calculated and the user has selected a given journey choice. The app even provides flights as a travel choice, a feature that no other app in this comparison does. (Google Play Store 2017.)
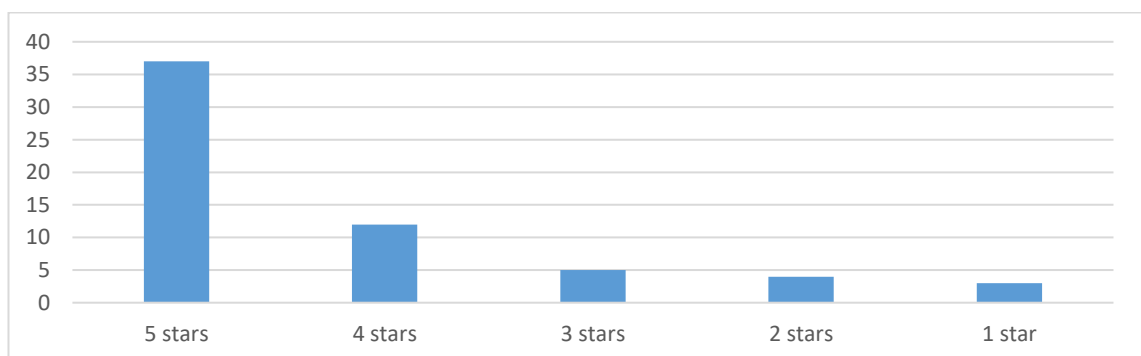

Figure 15. Variance of Google Play Store reviews for Perille (Google Play Store 2017)

Reviews for Perille, while the smallest amount in the comparison, were generally favoura-
ble. The average score of 4.2/5 was based on 61 total reviews, with all text reviews being
positive in tone and content.

5 Discussion

Overall, the results of the mixed method research via questionnaires were both good and bad. The qualitative data provides valuable and concrete information that can be used to develop pragmatic suggestions and ideas for service concept development. The intended number of responses for the business questionnaire was reached, whereas the consumer questionnaire and the number of responses were not as successful as originally intended.

Businesses seemed to place particular emphasis on integrating MaaS into their current business strategies, which is a strong indication of the validity and importance of the concept. One responder mentioned that the potential in combining different forms and methods of transportation into one efficient system is enormous. From a consumer standpoint, in theory travelling should become easier and especially more flexible. From a business standpoint, once the services cross international borders foreign customers become a significant part of the equation; The implication is that customer potential both nationally and internationally is virtually limitless.

According to one business questionnaire responder, multiple megatrends indicate that a need for significant change in the transport industry is needed. With self-driving and electric vehicles looming on the horizon and urbanisation increasing and projected to continue for decades, the need for personal transport diminishes and opportunities to innovate and provide new business models increases. In order to spur innovation, one responder urged companies and interested parties to cooperate open-mindedly and liberally. Companies should consider opening up their own ecosystems and making the information and closed systems available to other companies, instead of focusing on developing in-house solutions and strategies for everything. These are significant statements to make coming from a large, established Finnish corporation, and indicate that the paradigm shift in the transport sector, as one responder put it, is well underway.

The results of the consumer questionnaire shine an interesting light on the current state of public transport in Finland, as well as giving limited insight into how consumers perceive shifts in the market and status quo. Half of the responders said they had heard of MaaS prior to the survey – an indication that even at this highly conceptual stage, half of the potential market are aware of potential future business models. This in itself is a promising sign that consumers are potentially welcoming changes in the market – perhaps unsurprising given the historic stability in the Finnish rail market. On the other hand, roughly three quarters of responders said they are at least somewhat satisfied with public transport in Finland – this could imply that they are satisfied with the service providers or

the services themselves. Based on the previously mentioned fact that consumer satisfaction for Finnish rail transport is among the highest in Europe, one might assume that the satisfaction has to do with both. Regardless, 25% of responders feel unsatisfied by public transport – a significant portion of total customer satisfaction.

Despite the relative satisfaction with public transport and rail in Finland, the same number of responders – almost three quarters – said that they feel there should be MaaS systems in Finland and that there is noticeable demand for MaaS business models and offerings. This indicates that, while current offerings may be good, there is significant demand for additional services alongside the current offerings. Most responders seemed to want an alternative offering, rather than a system that will entirely replace current offerings.

Most responders (64.4%) said they only use one method of transport daily. This information is slightly at odds with the previous responses. The indication here may be that, while most people normally use one method of transport daily, there are sometimes or often needs for multiple methods. MaaS would solve this problem given that it is easy enough for casual users – the ones implied in this question – to pick up and use without much effort. As the results of another question indicate, the vast majority of responders (69.4%) would prefer to use a service via their smartphone or an app. Payments would ideally work through pay-as-you-go or monthly instalments – both methods had equal support. It's worth mentioning that almost 30% of responders indicated that they would also like to use a service via a website or through a physical point of sale – in this example, something like a ticket machine might be ideal versus a sales booth. Among the most requested features and benefits of MaaS systems were cheap prices (the thought perhaps being that a new service means a higher price, as is often the case) and more flexibility.

The benchmarking of apps and MaaS systems and models was successful due to the vast availability of data on each app or service. In particular, the standout services in the comparison were Vienna Pass, Qixxit, Hannovermobil, and Moovel, with a cumulative 7000+ individual user reviews online. These services are also the most advanced in terms of implementing MaaS – all offer robust journey planning features as well as ticketing and billing features, which the other apps are missing.
Of the most robust and feature-rich apps, Qixxit and the German version of Moovel are the most developed and some of the most popular apps in the comparison. Their implementation and combination of journey planner, billing and ticketing interface, and especially national functionality (in Germany) make them significantly more useful as a business model, and are also the best examples of working, efficient MaaS implementations in

widespread use. From the standpoint of VR, testing of apps not based in Finland is unfortunately quite challenging. Due to the nature of the business model itself, one must be in e.g. Germany to use Qixxit and be able to fully test the features (such as billing, which may for example be limited to German payment cards only) and benefits of the app.

Many of the smaller apps have similar functionality and features, such as the Finnish Tuup, but are still very limited in terms of user base, location(s), and usability. The aforementioned Whim, which was demarkated from the research, is also a significant example of a working MaaS system in Finland, but is still in beta testing with a small group of customers.

The results of the questionnaires indicate that there is comparatively significant demand from both businesses and consumers for new and innovative business models and services in the transport sector in Finland. Based on the results of benchmarking MaaS apps and systems, the ideal system in Finland might a nationwide system that supports ticketing from, ideally, all major service providers of public and private transport in the country. Because rail transport is a relatively small part of overall passenger traffic in Finland, VR should be looking at cooperating with other service providers and businesses in other forms of transport in the country, such as coach and bus services.

Due to the comparative inflexibility of rail transport (inability to travel outside of rail networks), VR might consider working actively together with service providers such as Onnibus and Matkahuolto – two of the country's largest nationwide coach and bus operators – to extend their service networks cost-effectively and without significant infrastructure investments.

On a more microeconomic level, smaller service providers such as taxi and ride-sharing businesses are often the only choice of non-private transport in areas with less dense populations. While not significant when compared to larger, more popular areas of routes, VR might consider cooperating with smaller businesses to, again, extend their network to reach potentially thousands of people. If the infrastructure were to already exist in the form of an app that combines, for example, VR's train tickets with Matkahuolto's bus tickets, in theory other service providers would be easy to integrate. The barriers to entry into smaller areas would be lower, and the incentive to extend cooperation and travel networks to smaller and less significant areas would be higher.

Extending VR's services into new territories and areas in Finland via means other than rail might be a novel innovation for the company. Because rail infrastructure extensions have

significant upfront costs and require investments in land, labour, and capital, cooperation with other businesses and service providers in itself is a novel idea for the company, and could be used in and of itself to market the new routes. Because personal transport has such significant market share in Finland, VR might consider developing or co-developing an app to go alongside these new market expansions and service offerings.

Based on the benchmarking of MaaS apps, in order for the app to be successful and work well, it must meet certain criteria. The app needs to be free, it needs to work well on a wide range of devices, and it must integrate as many features of travel as possible. As the benchmarking showed, every app has some form of travel or journey planner built in. Every Android or Apple smartphone comes with their own version of map services, each with their own journey planning and versions of local transport timetables. Thus, the app needs a significant competitive advantage.

The most popular and successful MaaS apps all have robust, functional payment, ticketing, and billing systems that fully integrate into the user experience. Without in-app purchases and ticketing, the app risks turning into yet another journey planner app alongside countless others. In addition, the payment functionality should include other service providers or co-operators, as previously suggested. If the app only sells VR tickets, then only VR's current customers (as opposed to people who don't travel by rail) will use the app, significantly limiting growth potential; The app would function in the same way as VR's current offerings – selling only their own tickets for their own services. As the business questionnaire indicated, many businesses (including large national ones) are interested in cooperation and sharing data with each other.

The nature of this topic means the services and the proposed methods and ideas are highly conceptual. While this means that any concrete developments in services or offerings may not be on the market soon, there is near limitless potential for research and development. If the results of the research are a true indication of MaaS, demand will continue to grow over the coming years and decades, and VR has an opportunity to be on the cutting edge of new innovations and concepts in the transport service industry.

It is highly recommended that VR actively pursue research and development in the fields of MaaS, ride sharing, and combined transport. The outlook for MaaS seems promising, and the research indicates that, while in Finland the model is still in its infancy, there is massive potential and interest among both consumers and businesses.

Overall, I am satisfied with the process of developing and working on the thesis. Naturally, the work involved a lot of research, cooperation, legwork, and above all patience. My motivation remained mostly high throughout the entire thesis process, and I feel I learned a lot more than I expected to. I feel I have grown and developed as a professional since starting the thesis more than half a year ago.

Unfortunately, time was a very limiting factor in the thesis process. Due to working full time during the entire thesis process, finding and more importantly allocating free time to working on the thesis proved a lot more challenging than originally expected. Due to the long and extensive nature of the thesis work itself, I often found myself lacking motivation and interest in the topic and work in general, especially during long breaks in work and writing – though overall motivation was high. Learning to juggle work, the thesis, schoolwork, and free time was a significant challenge in itself, but I certainly learned a lot about prioritisation and the meaning of hard work and perseverance.

If I were to start the thesis process from the beginning knowing what I now know after completing the thesis, I would have conducted the research differently. The questionnaires were not, in my opinion, relevant enough to the research topic to be of enough use, and I feel they could have been much better overall. The number of answers in the public questionnaire was also insufficient, in part due to ineffective networking and sharing of the questionnaires online. Unfortunately, I was unable to negotiate widespread sharing of the questionnaire through either the school network, or VR's social media network. This is something I feel could have made a significant difference in the number of answers.

The structure of the research and thesis itself changed significantly over the course of the entire thesis process. While this was expected, the way I handled it by not doing so carefully and considering the changes in the work overall meant I spend a lot of time backtracking and fixing content and text within the thesis. While not a lot of work or content went to waste, a lot of time was wasted working out details or fixing mistakes that could have been avoided in the first place through better planning and more careful consideration for future alterations.

Overall, I feel I have grown professionally during this time period more so than any other during my study time, and I am glad I undertook the challenge with good motivations and with an interesting topic to retain my interest.

References

American Intercontinental University 2012. Qualitative vs. Quantitative Research. URL: https://www.aiuniv.edu/blog/2012/october/qualitative-vs-quantitative-research. Accessed: 27 November 2017.

Andersson, L. 2016. Liikennekaari – miten liikennepolitiikka mullistuu. Blog post. http://www.liandersson.fi/liikennekaari-miten-liikennepolitiikka-mullistuu/. Accessed: 16 April 2017.

Apple 2017. iOS 11. URL: https://www.apple.com/lae/ios/ios-11/. Accessed: 27 November 2017.

Basle, A. 2016. Circular mobility megatrend: 14 million Europeans will use car-sharing in 2021. Circular Change. URL: http://www.circularchange.com/circular-mobility-megatrend-14-million-europeans-will-use-car-sharing-2021. Accessed: 24 October 2017.

Bert, J, Collie, B, Gerrits, M. & Xu, G. 2016. What's Ahead for Car Sharing? The New Mobility and Its Impact on Vehicle Sales. BCG Perspectives. URL: https://www.bcgperspectives.com/content/articles/automotive-whats-ahead-car-sharing-new-mobility-its-impact-vehicle-sales. Accessed: 24 October 2017.

Bielaszka-DuVernay, C. 2008. Developing Services Consumers Want. Harvard Business Review. URL: https://hbr.org/2008/11/developing-services-consumers. Accessed: 26 November 2017.

Breiby, E, Wanberg, M. 2011. Successful business model innovation. Research Gate. URL: https://www.researchgate.net/file.PostFile-Loader.html?id=549297e7d5a3f2421b8b45e4&asset-Key=AS%3A273654447837184%401442255714237. Accessed: 26 November 2017.

Business Dictionary 2017. Customer orientation definition. URL: http://www.businessdictionary.com/definition/customer-orientation.html. Accessed: 26 November 2017.

Calder, S. 2016. Britain's railways doing well despite privatisation. The Independent. URL: http://www.independent.co.uk/news/uk/home-news/britains-railways-doing-well-despite-privatisation-a6843966.html. Accessed: 16 April 2017.

Cambridge Dictionary 2017. Benchmarking definition. URL: http://www.dictionary.cambridge.org/us/dictionary/english/benchmarking. Accessed: 16 October 2017.

Chron 2017. Customer Orientation Examples. URL: http://smallbusiness.chron.com/customer-orientation-examples-10201.html. Accessed: 26 November 2017.

Collins Dictionary 2017. Definition of benchmarking. URL: https://www.collinsdictionary.com/amp/english/benchmarking. Accessed: 27 November 2017.

The Economist 2013. The rise of the sharing economy – On the internet, everything is for hire. URL: https://www.economist.com/news/leaders/21573104-internet-everything-hire-rise-sharing-economy. Accessed: 24 October 2017.

The Economist 2016. It starts with a single app. URL: http://www.economist.com/news/international/21707952-combining-old-and-new-ways-getting-around-will-transform-transportand-cities-too-it. Accessed: 1 May 2017.

EU Business 2013. EU moves to end state rail monopolies. URL: http://www.eubusiness.com/news-eu/transport-rail.loy. Accessed: 26 November 2017.

European Commission 2016. Fifth report on monitoring developments of the rail market. URL: https://ec.europa.eu/transport/sites/transport/files/swd-2016-0427.pdf. Accessed: 21 May 2017.

Finnish Government 2016. Hallituksen esitys eduskunnalle liikennekaareksi ja eräiksi siihen liittyviksi laeiksi. URL: http://www.valtioneuvosto.fi/paatokset/paatos?decisionId=0900908f804d054d. Accessed: 16 April 2017.

Forbes 2016. Self-Driving Cars: The Building Blocks of Transportation-as-a-Service. URL: https://www.forbes.com/sites/greatspeculations/2016/09/20/self-driving-cars-the-building-blocks-of-transportation-as-a-service. Accessed: 24 October 2017.

Goldstein, S, Johnston, R, Duffy, J, Rao, J. 2002. The service concept: the missing link in service design research. Pennsylvania State University. URL: http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.472.4465&rep=rep1&type=pdf. Accessed: 26 November 2017.

Google 2017. About the Google Play Store. URL: https://developer.android.com/distribute/google-play/about.html. Accessed: 27 November 2017.

Google 2017. Google Business Reviews of Vienna Pass. URL: https://www.google.com/search?q=Vienna%20Pass&ludocid=14359518866573487279#lrd=0x0:0xc747425443a1ecaf,1. Accessed: 31 October 2017.

Google Play Store 2017. App page for Whim – Travel Smarter. URL: https://play.google.com/store/apps/details?id=global.maas.whim. Accessed: 27 November 2017.

Google Play Store 2017. Reviews for GVH app. URL: https://play.google.com/store/apps/details?id=air.de.projektionisten.efa.app.gvh. Accessed: 7 November 2017.

Google Play Store 2017. Reviews for Moovel global app. URL: https://play.google.com/store/apps/details?id=com.moovel.na.mint. Accessed: 7 November 2017.

Google Play Store 2017. Reviews for Moovel German app. URL: https://play.google.com/store/apps/details?id=com.daimler.moovel.android. Accessed: 7 November 2017.

Google Play Store 2017. Reviews for Perille app. URL: https://play.google.com/store/apps/details?id=com.perille.android.PerilleApp. Accessed: 7 November 2017.

Google Play Store 2017. Reviews for Qixxit app. URL: https://play.google.com/store/apps/details?id=de.hafas.android.qixxit. Accessed: 7 November 2017.

Google Play Store 2017. Reviews for Tuup app. URL: https://play.google.com/store/apps/details?id=fi.tuup.tuupapp. Accessed: 7 November 2017.

Greater Hanover Transport Association 2017. Product Overview. URL: https://shop.gvh.de/. Accessed: 22 October 2017.

Helsingin Sanomat 2017. Liikennepalvelujen iso uudistus etenee vihdoin. URL: https://www.hs.fi/paakirjoitukset/art-2000005176907.html. Accessed: 26 November 2017.

Jacobs, J. 1961. The Death and Life of Great American Cities. Vintage Books Edition, December 1992. Random House. New York.

Karim, D. 2017. Creating an Innovative Mobility Ecosystem for Urban Planning Areas. Springer. URL: http://www.springer.com/cda/content/document/cda_downloaddocument/9783319516011-c2.pdf. Accessed: 24 October 2017.

Keller, K. 2001. Building Customer-Based Brand Equity: A Blueprint for Creating Strong Brands. Academia. URL: http://www.academia.edu/download/40863813/CustomerBasedbrandEquityModel.pdf. Accessed: 26 November 2017.

Kuchera, B. 2017. The anatomy of a review bombing campaign. Polygon. URL: https://www.polygon.com/2017/10/4/16418832/pubg-firewatch-steam-review-bomb. Accessed: 27 November 2017.

Laitinen, J. 2016. Hallituksen liikennekaari mullistaa Suomen joukkoliikenteen – uudistus tuo OP-ryhmän kaltaiset jätit rytinällä liikennebisnekseen. Helsingin Sanomat. URL: http://www.hs.fi/kotimaa/art-2000002921980.html. Accessed: 16 April 2017.

MaaS Global 2017. Whim – Better than owning a car. URL: http://maas.global/whim/. Accessed: 1 May 2017.

McMahon, T. 2016. 8 Benefits of Benchmarking. A Lean Journey. URL: http://www.aleanjourney.com/2016/02/8-benefits-of-benchmarking.html. Accessed: 27 November 2017.

Ministry of Transport and Communications 2016. Arviomuistio liikennekaaren 2. vaihteen toteuttamisesta. URL: http://www.lvm.fi/lvm-site62-mahti-portlet/download?did=221787. Accessed: 16 April 2017.

Ministry of Transport and Communications 2016. Liikennepalvelulaki. URL: http://www.lvm.fi/liikennekaari. Accessed: 16 April 2017.

Ministry of Transport and Communications 2017. Opening passenger rail transport to competition in Finland, Minister Anne Berner, Press conference on 9 August 2017. URL:

https://www.slideshare.net/lvmfi/opening-passenger-rail-transport-to-competition-in-finland-minister-anne-berner-press-conference-9-august-2017. Accessed: 10 October 2017.

Ministry of Transport and Communications 2017. Passenger rail transport opens to competition. URL: https://www.lvm.fi/en/-/passenger-rail-transport-opens-to-competition-949441. Accessed: 10 October 2017.

Moss, S. 2015. End of the car age: how cities are outgrowing the automobile. The Guardian. URL: http://www.theguardian.com/cities/2015/apr/28/end-of-the-car-age-how-cities-outgrew-the-automobile. Accessed: 1 May 2017.

Nanny State Index 2017. The best and worst countries to eat, drink, smoke & vape in the EU. URL: http://ieananny1.wpengine.com/finland-2017/. Accessed: 27 November 2017.

Netz Sieger 2017. Qixxit im Test 2017. URL: https://www.netzsieger.de/p/qixxit. Accessed: 22 October 2017.

Oer, H. 2013. Research for Understanding Word Frequency Effects on People. Academia. URL: https://www.academia.edu/5445347/Research_for_Understanding_Word_Frequency_Effects_on_People. Accessed: 27 November 2017.

Railway Technology 2017. Engines of trade: the ten biggest rail companies by revenue. URL: http://www.railway-technology.com/features/featureengines-of-trade-the-ten-biggest-rail-companies-by-revenue-4943955/featureengines-of-trade-the-ten-biggest-rail-companies-by-revenue-4943955-1.html. Accessed: 22 October 2017.

Shaheen, S, Chan, N, Bansal, A. & Cohen, A. 2015. Shared Mobility: Definitions, Industry Developments, and Early Understanding. Innovative Mobility. URL: http://innovativemobility.org/?project=shared-mobility-definitions-industry-developments-and-early-understanding. Accessed: 24 October 2017.

Singh, S. 2015. Mega Trends and Their Impact on Future of Mobility. Frost & Sullivan. URL: https://ww2.frost.com/files/9114/3620/7521/Sarwant_IM_deck_V10.pdf. Accessed: 24 October 2017.

Stroud, J. 2017. Understanding the Purpose and Use of Benchmarking. Isixsigma. URL: https://www.isixsigma.com/methodology/benchmarking/understanding-purpose-and-use-benchmarking/. Accessed: 27 November 2017.

Surveymonkey 2017. Likert scale. URL: https://www.surveymonkey.com/mp/likert-scale/. Accessed: 27 November 2017.

Tripadvisor 2017. Reviews for Vienna Pass. URL: https://www.tripadvisor.com/Attraction_Review-g190454-d10477761-Reviews-Vienna_Pass-Vienna.html. Accessed: 5 November 2017.

Trustpilot 2017. Reviews for Vienna Pass. URL: https://www.trustpilot.com/review/viennapass.com. Accessed: 5 November 2017.

Turunen, T. 2008. Service Concept Development – An Approach for Professional Service Firm. Thesis abstract. URL: http://www.doria.fi/handle/10024/38765. Accessed: 26 November 2017.

UK Essays 2017. Traffic Congestion. URL: https://www.ukessays.com/essays/transportation/traffic-congestion.php. Accessed: 28 November 2017.

Union Internationale des Transports Publics 2016. Mobility as a service: an alternative to owning a car. URL: http://www.uitp.org/news/maas-finland. Accessed: 1 May 2017.

United Nations 2014. World Urbanization Prospects. URL: https://esa.un.org/unpd/wup/publications/files/wup2014-highlights.pdf. Accessed: 1 May 2017.

University of Southern California 2017. Organising your Social Sciences Research Paper: Theoretical Framework. URL: http://libguides.usc.edu/writingguide/theoreticalframework. Accessed: 26 November 2017.

Vienna Pass 2017. Interested in what previous Vienna PASS customers thought? URL: https://www.viennapass.com/reviews-customer-comments/. Accessed: 22 October 2017.

Vienna Pass 2017. Vienna Travelcard – Get Around Vienna With Ease. URL: https://www.viennapass.com/vienna-transport/. Accessed: 22 October 2017.

VR Group 2017. First MaaS pilots realised this spring: VR to start building travel chains in Finland. Press release. URL: http://www.vrgroup.fi/fi/vrgroup/uutishuone/uutiset-ja-tiedotteet/first-maas-pilots-realised-this-spring-vr-to-start-building-travel-chains-in-finland-300320170942/. Accessed: 26 November 2017.

VR Group 2017. VR Group yrityksenä. URL: http://www.vrgroup.fi/fi/vrgroup/vr-group-yri-tyksena/. Accessed: 26 November 2017.

VR Group 2017. Vuosiraportti 2016. URL: http://2016.vrgroupraportti.fi/fi/. Accessed: 26 November 2017.

Ward Group 2017. Benefits of Benchmarking. URL: https://www.wardinc.com/benefits-of-benchmarking/. Accessed: 27 November 2017.

Appendices

Appendix 1: Questionnaire

Matkaketjupalvelut

Matkaketjupalvelut, tunnetummin MaaS eli Mobility as a Service, on palvelukonsepti jossa eri liikennepalveluita ja -muotoja yhdistetään yhden järjestelmän alle. Esimerkiksi Helsingissä käytössä oleva Whim-sovellus tarjoaa kiinteää kuukausimaksua vastaan tietyn määrän taksimatkoja ja HSL:n lähiliikenteen lähes rajatonta käyttömahdollisuutta, edullisemmin kuin erikseen ostettuina.

*Required

1. **Olitko tietoinen matkaketjupalveluista tai MaaS-konseptista ennen tätä kyselyä?** *
   Mark only one oval.

   ◯ Kyllä

   ◯ En

2. **Oletko tyytyväinen julkiseen liikenteeseen Suomessa?** *
   Mark only one oval.

   ◯ Täysin samaa mieltä

   ◯ Jokseenkin samaa mieltä

   ◯ Jokseenkin eri mieltä

   ◯ Täysin eri mieltä

3. **Haluaisitko, että eri liikennemuotoja yhdistettäisiin yhden lipun tai maksun alle (esimerkiksi kaupunkipyörät ja junaliput)?** *
   Mark only one oval.

   ◯ Täysin samaa mieltä

   ◯ Jokseenkin samaa mieltä

   ◯ Jokseenkin eri mieltä

   ◯ Täysin eri mieltä

4. **Onko mielestäsi matkaketjupalveluille tai yhdistetyille matkoille kysyntää Suomessa?** *
   Mark only one oval.

   ◯ Täysin samaa mieltä

   ◯ Jokseenkin samaa mieltä

   ◯ Jokseenkin eri mieltä

   ◯ Täysin eri mieltä

Matkaketjupalvelut tulevaisuudessa

Tulevaisuudessa on mahdollista, että esimerkiksi vuokrattavan kaupunkipyörän käyttöoikeuden, julkisen liikenteen lipun, sekä sovitun määrän taksimatkoja voisi lunastaa yhdellä maksulla, yhdestä paikasta ilman erillisiä tilejä tai sopimuksia. Esimerkkejä tästä löytyy helpoiten pakettimatka-alalta, jossa palvelut kuten Expedia tai Momondo tarjoavat kokonaisia lomakokemuksia lentoineen ja hotelleineen yhdellä maksulla.

33

5. **Kuinka montaa liikennemuotoa käytät päivittäin?** *

Mark only one oval.

- ◯ Yhtä
- ◯ Kahta
- ◯ Kolmea
- ◯ Neljää tai useampaa

6. **Mitä liikennemuotoja käytät päivittäin?** *

Tick all that apply.

- ☐ Lähiliikenteen linja-autoa
- ☐ Kaukoliikenteen linja-autoa
- ☐ Lähijunaa
- ☐ Kaukojunaa
- ☐ Metroa
- ☐ Raitiovaunua
- ☐ Omaa polkupyörää
- ☐ Vuokrattavaa polkupyörää
- ☐ Omaa autoa
- ☐ Jaettua tai vuokrattavaa autoa
- ☐ Taksia
- ☐ Other: _____

7. **Millä tavalla haluaisit käyttää matkaketjupalveluita (esim. maksut, liput, käyttöoikeuden lunastukset)?** *

Tick all that apply.

- ☐ Älypuhelinsovelluksella
- ☐ Nettisivun kautta
- ☐ Myyntipisteissä tai -automaateilla
- ☐ Kiinteällä kuukausimaksulla
- ☐ Käytön mukaan laskutettuna
- ☐ Other: _____

8. **Mitä haluaisit nähdä lähitulevaisuudessa matkaketjupalveluiden osalta suomalaisilta yrityksiltä?** *

_____

_____

_____

_____

9. **Anna vapaasti palautetta! :)**

_____

_____

_____

_____

_____

34

Matkaketjupalvelut - Yrityskysely

Matkaketjupalvelut, tunnetummin MaaS eli Mobility as a Service, on palvelukonsepti jossa eri liikennepalveluita ja -muotoja yhdistetään yhden järjestelmän alle. Esimerkiksi Helsingissä käytössä oleva Whim-sovellus tarjoaa kiinteää kuukausimaksua vastaan tietyn määrän taksimatkoja sekä HSL:n lähiliikenteen lähes rajatonta käyttömahdollisuutta - edullisemmin kuin erikseen ostettuina.

*Required

1. **Mitä yritystä edustat?**

   _____

2. **Olitteko tietoisia matkaketjupalveluista tai MaaS-konseptista ennen tätä kyselyä?** *
   Mark only one oval.

   ⭘ Kyllä

   ⭘ Ei

3. **Kuinka aktiivisesti alanne tai yhtiönne osallistuu matkaketjupalveluiden kehittämiseen tai toteuttamiseen?** *

   _____

   _____

   _____

   _____

   _____

Matkaketjupalvelut tulevaisuudessa
Tulevaisuudessa on mahdollista, että esimerkiksi vuokrattavan kaupunkipyörän käyttöoikeuden, julkisen liikenteen lipun, sekä sovitun määrän taksimatkoja voisi lunastaa yhdellä maksulla, yhdestä paikasta ilman erillisiä tilejä tai sopimuksia. Esimerkkejä tästä löytyy helpoiten pakettimatka-alalta, jossa palvelut kuten Expedia tai Momondo tarjoavat kokonaisia lomakokemuksia lentoineen ja hotelleineen yhdellä maksulla.

4. **Mitä haluaisitte nähdä lähitulevaisuudessa matkaketjupalveluiden osalta Suomessa (esimerkiksi yhteinen lippusovellus)?** *

   _____

   _____

   _____

   _____

   _____

5. Millä tavalla matkaketjupalveluille tai yhdistetyille matkoille olisi kysyntää Suomessa? *

---

6. Mitä haluaisitte yhtiönne kannalta nähdä muilta liikenne- ja kuljetusyhtiöiltä matkaketjupalveluiden suhteen? *

---

7. Vapaa palaute:

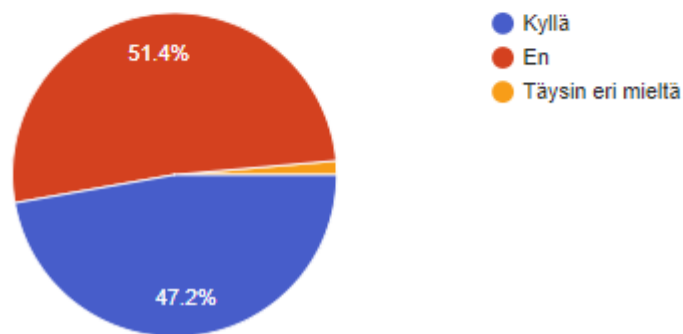---

---

Appendix 3: Responses to questionnaire
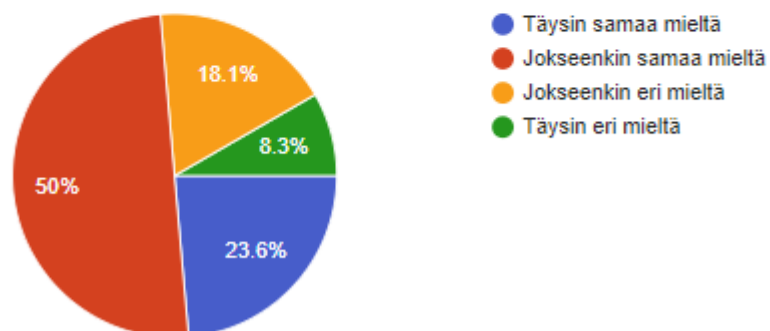
Matkaketjupalvelut

72 responses

Publish analytics

Olitko tietoinen matkaketjupalveluista tai MaaS-konseptista ennen tätä kyselyä?

72 responses

- Kyllä
- En
- Täysin eri mieltä

51.4%

47.2%

Oletko tyytyväinen julkiseen liikenteeseen Suomessa?

72 responses

- Täysin samaa mieltä
- Jokseenkin samaa mieltä
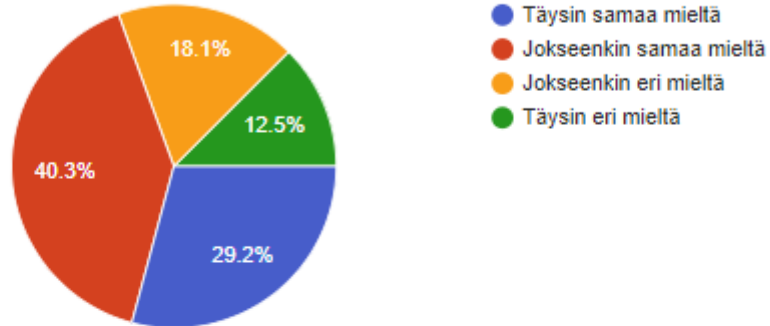- Jokseenkin eri mieltä
- Täysin eri mieltä

18.1%

8.3%

50%

23.6%

Haluaisitko, että eri liikennemuotoja yhdistettäisiin yhden lipun tai maksun alle (esimerkiksi kaupunkipyörät ja junaliput)?

72 responses

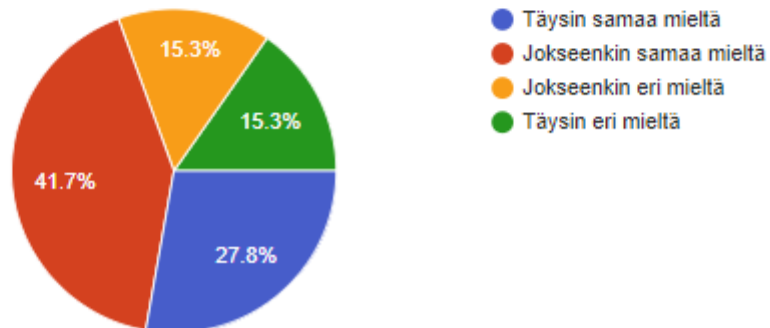- ● Täysin samaa mieltä
- ● Jokseenkin samaa mieltä
- ● Jokseenkin eri mieltä
- ● Täysin eri mieltä

18.1%
12.5%
40.3%
29.2%

Onko mielestäsi matkaketjupalveluille tai yhdistetyille matkoille kysyntää Suomessa?

72 responses

- ● Täysin samaa mieltä
- ● Jokseenkin samaa mieltä
- ● Jokseenkin eri mieltä
- ● Täysin eri mieltä

15.3%
15.3%
41.7%
27.8%

Kuinka montaa liikennemuotoa käytät päivittäin?

45 responses

- Yhtä
- Kahta
- Kolmea
- Neljää tai useampaa

24.4%
11.1%
64.4%

Mitä liikennemuotoja käytät päivittäin?

45 responses

Liikennemuoto	Määrä
Lähiliikentee…	10 (22.2%)
Kaukoliikent…	0 (0%)
Lähijunaa	13 (28.9%)
Kaukojunaa	0 (0%)
Metroa	3 (6.7%)
Raitiovaunua	7 (15.6%)
Omaa polku…	4 (8.9%)
Vuokrattava…	1 (2.2%)
Omaa autoa	23 (51.1%)
Jaettua tai v…	1 (2.2%)
Taksia	8 (17.8%)
omaa autoa	1 (2.2%)
ammattiautoi…	1 (2.2%)
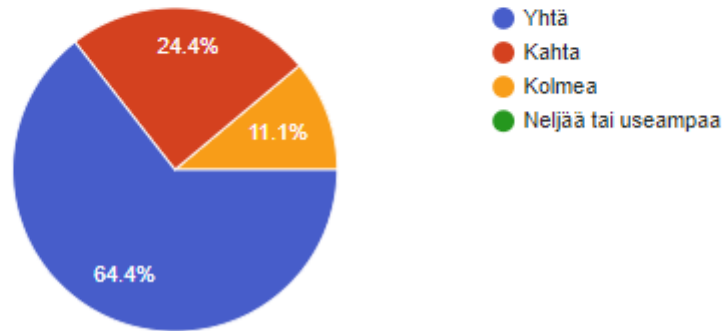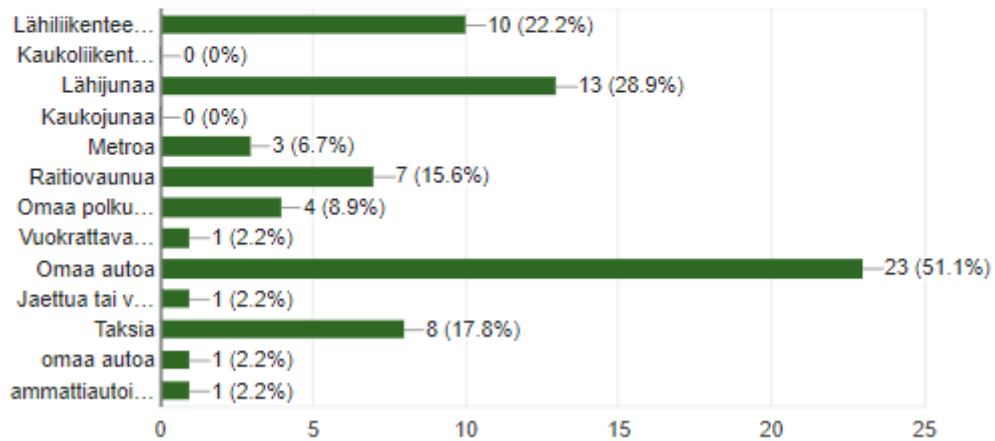
Millä tavalla haluaisit käyttää matkaketjupalveluita (esim. maksut, liput, käyttöoikeuden lunastukset)?

72 responses
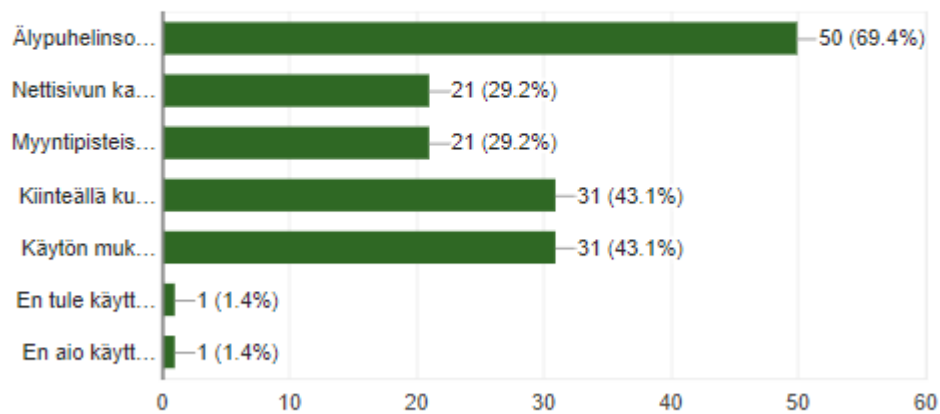
Mitä haluaisit nähdä lähitulevaisuudessa matkaketjupalveluiden osalta suomalaisilta yrityksiltä?

72 responses

- (5)

. (4)

En osaa sanoa (3)

Toimivuutta (2)

NIGHT TRAINS TO/FROM AIRPORT

Eri palveluntarjoajien järkevää yhteistyötä. Lisäksi DriveNow tyyliset palvelut plussaa, koska auton vuokraaminen on kovin vaivalloista.

Tehdä matkustamisesta mahdollisimman helppoa. Helsingissä tämä toimii jo jokseenkin hyvällä tasolla kun yhdellä lipulla voi matkustaa kaikilla kulkuvälineillä. Mutta VR:n palvelut(pitemmät matkat) eivät tähän sisälly.

Näin pienessä maassa luottaa yhteen tai kahteen toimijaan. Eikä jokaisen firman omaa ratkaisua

Helppoa ja yksinkertaista käyttöä, kätevämpi kuin vain HSL kortti (joka on siis jo kätevä). Ilmainen matkalippu opiskelijoille/eläkeläisille ainakin

Enemmän yhteistyötä

Joustavuutta ja sujuvuutta, sekä yhteistyökykyä.

Parempaa liityntäliikennettä, joustavampaa lippupolitiikkaa

Mahdollisuus toimia onnistuisi todennäköisesti vain isoimmissa kaupungeissa muuten en usko että Suomessa olisi käyttöä vaikka välimatkojen takia olisikin hyödyllistä

palvelun pitää olla käytön mukaan, ei mitään järkeä maksaa paketista, jossa tarpeettomia osia, miksi maksaisin varmuuden vuoksi, kun nyt jo voin maksaa käytön mukaan, matkakortilla valmiiksi ladattuna voin maksaa pk-seudun junat, bussin ja ratikat, pankkikortilla voin hoitaa junaliput ja taksin, taksia voin käyttää tarvittaessa ilman ennakkomaksuja nytkin

Joustavia palvelumalleja jotka on helposti saatavilla käyttäjille. Esim. yhdistelmä juna ja lähiliikenne. Junamatka Oulusta Helsinkiin ja lähiliikenteen käyttö Helsingissä yhdellä maksulla.

Halvempia hintoja!

Kehitystä

Sponsorointia (myös hyvää mainosta yrityksille)

Kohtuullisia hintoja ennen kaikkea ja että matkaketjupalveluita voi räätälöidä itselleen sopiviksi

Talvi ei yllättänyt VR:ää.

Sovellus, jossa voi ladata omalle lipulleen aikaa, arvoa ja valita mitä palveluita ostaa (seutu/HKI sisäinen). Lisäksi jos samalle lipulle saisi muita matkoja, kuten pitkät junamatkat, sovelluksen kautta olisi se kätevää. Ainakin näin muualla opiskelevalle, jonka perhe kuitenkin asuu Helsingissä.

Yhtenäisyyttä

Helppoa matkustamista yhdellä lipulla ja edullisilla hinnoilla. Joukkoliikenne käsittäisi nykyisten lisäksi myös pyörät, joukkotaksit yms.

Hyvää yhteistyötä

Yhteiskäyttöautopalveluiden laajentumista.

Verkkopalvelut monipuolisemmiksi

Uusia innovaatioita

Palveluiden kehittämistä helpommin lähestyttävään muotoon

Yhdellä lipulla kotiovelta kohteeseen

Älykkäitä door to door -ratkaisuita koko suomen laajuisesti. Whim kattaa koko Helsingin joten markkinarakoa on kehitykselle myös koko suomessa.

Jos tarvii vain harvoin autoa, pystyisi saamaan suht edullisia matkoja.

Toimivuus pääkaupunkiseudun ulkopuolellakin

Innovatiivisia ratkaisuja. Joustavia ja asiakasta palvelevia kokonaisuuksia.

Paremmat liitäntäyhteydet eri kulkuvälineistä toiseen

Mahdollisimman helppoa ja sujuvaa palvelua, jolla eri liikennemuotoja saadaan yhdistettyä.

Yksinkertaista ja selkeää hinnoittelua.

.

Enemmän palveluntarjontaa

En mitään. Mielestäni idea on typerä jo suunitteluvaiheessa.

Unohdetaan koko juttu!

En mitään.

Ilmaisia taksimatkoja

Ei tule mieleen mitään

Hyvää palvelua

Karkkid

Hinnoittelu kohdalleen. Whim liian kallis.

X

Maksu käytön mukaan ilman yhteiskunnan verosubventiota

Rauhoittukaa

Matkaketjun ilman vaihtoviivettä ja hässäkkää

Niin....ehkä heitän vastakysymyksen. Suomalainen yritys, joo...loistavaa, mutta tämähän on tuomassa tänne vain ulkomaisia operaattoreita. Myös MaaS tai Whim- nimenä ovat kansainvälisiä. Ei teitä kiinnosta Suomi tai Suomen tulevaisuus, vaan kiinnostus on Maximoida oman yrityksenne voitto tavallisen veronmaksajan kustannuksella. Toimintanne ei ole avointa, eikä se tule sitä olemaankaan.

hyviä yrityksiä

Toimivia sovelluksia ja yrittämisen velvoitteet hoitavia kotimaisia operaattoreita, verot, henkilökunnan palkat ja palkan sivukulut tulee maksaa kuten vastuullisen yrityksen kuuluu.

Jotain realistista

Pienessä kaupungissa nämä ovat aivan turhia, koska oma auto on ainoa, joka on käytössä heti, tarvittaessa ja rajoituksetta

Anne Bernerin työttömänä

laatua

Hyvää asiakaspalvelua ja kattavaa palvelua koko Suomessa

Mitä

Yksi lippu ja kotiovelta kohteeseen

Jaa a

Taksien/kimppataksien ja julkisen liikenteen saumaton yhdistäminen helpottaisi varmasti monen elämää kiireisille hetkillä/ vaikeasti tavoitettavissa oleviin paikkoihin pääsyllä niille, joilla ei ole henkilöautoa

Anna vapaasti palautetta! :)

11 responses

Don't make open feedback field mandatory: people'll just close the page in an ennui-esque frustration

kustannustehokkaat maksujärjestelmät, ei mitään paketteja jossa turhia osia,

Kiitos mielenkiintoisesta aiheesta. Työskentelen alalla joka tarjoaa yhtä osaa matkaketjupalvelussa, ja nyt kun tiedän mikä termi kuvastaa kyseistä prosessia, voin tutkia asiaa tarkemmin.

Tsemppiä! :)

-

gg

Mielenkiintoinen aihe, jota ei ole käsitelty ehkä tarpeeksi vielä mediassa.

Mielenkiintoinen kysely!

Suosittelen unohtamaan Suomen markkinat. Täällä ei ole teille kysyntää.

Aikamoista haihattelua, maksavat asiakkaat puuttuvat

En jaksa uskoa, että teidän palvelu tulee toimimaan pääkaupunkiseudun ulkopuolella.

Matkaketjupalvelut - Yrityskysely

5 responses

Publish analytics

Mitä yritystä edustat?

4 responses

Oy Ab
Oy
Oy

Olitteko tietoisia matkaketjupalveluista tai MaaS-konseptista ennen tätä kyselyä?

5 responses
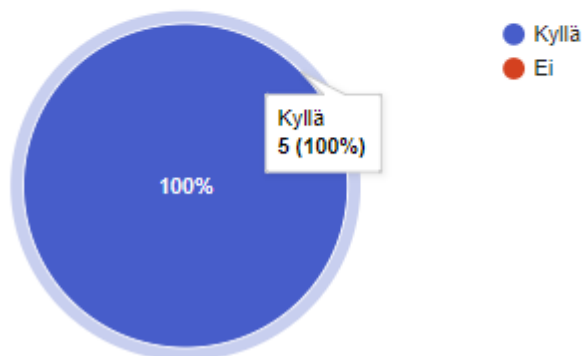
- Kyllä
- Ei

Kyllä
5 (100%)

100%

Kuinka aktiivisesti alanne tai yhtiönne osallistuu matkaketjupalveluiden kehittämiseen tai toteuttamiseen?

5 responses

aktiivisesti
Yrityksemme osallistuu hyvin aktiivisesti matkaketjupalveluihin.   omistaa mm. osan MaaS Global Oy:stä.   on laaja skaala erilaisia autoiluun liittyviä palveluita ja näemme MaaS ajatuksen olevan osa ydinstrategiaamme.
Hyvin aktiivisesti
Erittäin aktiivisesti
Ollaan mukana palveluilla

Matkaketjupalvelut tulevaisuudessa

Mitä haluaisitte nähdä lähitulevaisuudessa matkaketjupalveluiden osalta Suomessa (esimerkiksi yhteinen lippusovellus)?

5 responses

uusia palveluita
Haluaisin nähdä poliittisia päätöksiä esim MaaS:n verotukseen liittyen. Yhteiskunnan/Verotuksen tulisi tukea esim. verohelpotuksin MaaS-palveluita, kuten esim työsuhdeautoiluakin tuetaan.
Sujuvat asiakaslähtöiset matkaketjut eri liikennemuodoissa
Liikennekaaren ensimmäisen ja toisen vaiheen täysimittainen toteutus.
Kaupallista menestystä. Tähän mennessä puhutaan paljon, mutta käyttö on vielä pientä.

Millä tavalla matkaketjupalveluille tai yhdistetyille matkoille olisi kysyntää Suomessa?

5 responses

tekemällä helppoja ratkaisuja

Näen, että kun erilaiset kulkuvälineet yhdistetään toimivaksi kokonaisuudeksi poteltiaali on valtava. Varsinkin asiakkaan näkökulmasta matkustaminen helpottuu ja jouhevoituu. Palvelun ollessa kansainvälisesti käytössä myös ulkomaalaiset asiakkaat olisivat potentiaalinen asiakasryhmä.

Kehittyvä markkina, joka kasvaa asteittain uudistuvan tarjonnan myötä

Useat megatrendit viittaavat siihen, että tarvetta paradigmamuutokselle liikenteessä olisi.

Kätevä ja edullinen ovelta ovelle matka

Mitä haluaisitte yhtiönne kannalta nähdä muilta liikenne- ja kuljetusyhtiöiltä matkaketjupalveluiden suhteen?

5 responses

halpoja hintoja

Olemme olleet yhteydessä VR:aan ja viestini on se, että eri toimijouden tuli yhdistää voimansa vielä ennakkoluulottomammin jotta uudenlaisia yhteistöitä on mahdollista rakentaa. Näen myös, että esim   palveluita voisi tarjota monessa eri ekosysteemissä.

Aktiivista yhteistyötä sekä kaupallisesti että teknologisesti

Kaikilta liikennepalvelutarjoajilta kaikille toimjoille avoimet rajapinnat, joiden kautta on saatavilla kaikkia heidän eri lippu- tai palvelutyyppejään.

Ymmärrystä autonvuokrausalaa kohtaan. Autonvuokrauksessa vastuukysymysten vuoksi vaaditaan käyttäjältä enemmän tietoja kuin bussi- tai junalipun hankintaan.

Vapaa palaute:

1 response

kirjoitat: - Expedia tai Momondo tarjoavat kokonaisia lomakokemuksia lentoineen ja hotelleineen yhdellä maksulla - eikös tätä ole matkatoimistot tarjonneet vuosikymmeniä, sen jälkeen kuluttajat huomasivat, että saa parempia ratkaisuja, kun rakentaa ne itse, siis valitsee hotellin itse, matkat itse ja muut lisäpalvelut itse sen mukaan mitä arvostaa, nyt kuvitellaan että keihäsmatkoille olisi jälleen kysyntää, matkat-hotellit-sikajuhlat yhteen pakettiin kaikille samanlaisena... saas nähdä