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Research on the key success factors of Voi Technology Turku

ABSTRACT

Turku city have been allowing shared electric scooters to operate in their city since 2019. Although the vehicles and infrastructure has evolved massively in 4 short years, the concept remains the same. A shared vehicle that can be left most places, can be operated, and paid for through an application. This research is linked to one of Europe's main micro mobility operators. Voi Technology. To narrow the research to really get an understanding the research will be focusing on Voi Technology Turku, and what are the key factors that really determine the success of this company in Turku, Finland

The research and study methods will be performed through available resources that can be found on the internet, blog posts and official publications. The research will also be containing interviews with some of Voi Technologies top professionals along with one representative from Turku city. There will be two written interviews and 3 dialogue interviews. There will be a correlation of all of these interviews along with findings from a questionnaire sent out to 25 university students who are known to ride e-scooters. This will allow the research to determine what are the key factors allowing Voi Technology to be successful in Turku, Finland.

The results from this research paper will allow the reader to discover based on a Priori business model what are the key factors that allow Voi Technology Turku, to be successful.

Keywords

Voi Technology Turku, success, e-scooter, micro mobility, factors, operations

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APPENDICES

Appendix 1. Interview dialogue

ILLUSTRATIONS

USED ABBREVIATIONS

KPI - Key performance indicator

Voi - Voi Technology

E-scooter – Electric scooter

QA – Quality Assurance

V4 – Voiager 4

V6 – Voiager 6

E-bike – Electric bicycle

SOP – Standard operating procedure

RVD – Revenue per ready vehicle

TVD – Trips per ready vehicle

MPZ – Mandatory parking zones

1 INTRODUCTION

This research has been chosen to find out about Voi Technologies success in Turku. What are the key factors that has allowed Voi Technology to become successful in Turku? The research paper is solely focusing on Voi Technology Turku, for a better scope and more accurate numbers, data, customer satisfaction and in-depth interviews to give a clear answer to this research topic. The research methods for this research will consist of interviewing a range of experts within the field of micro mobility and topics that are closely linked to their roles. This you will find in section six.

1. Fleet manager, Turku
2. Warehouse manager, Turku
3. Fleet specialist, Turku
4. Quality assurance engineer, Stockholm headquarters
5. Turku cities Micro-Mobility project leader

Alongside these in depth interviews the research paper will contain a questionnaire with 25 e-scooter users from Turku University of Applied science.

2 RESEARCH OBJECTIVE, QUESTIONS AND MEASURES

The research objective is to investigate the ins and outs of the day to day running of Voi Technology Turku to help determine the key success factors. The objective is to analyse every aspect within these interviews and questionnaire to allow facts from all corners of management, departments, and consumers. The research interviews will be conducted face to face, virtually as well as sending questions via email or other messaging service. The questionnaire will be sent out to 25 participants who are known to ride e-scooters at least once a week. This was achieved by filtering out answers where participants have never ridden an e-scooter. The survey was sent out to students at Turku University of Applied science. The objective was to gain opinions from consumers as well as professionals.

METRICS OF SUCCESS

The first point of successful business according to Beth Worthy from Forbes.com is to have a solid plan of your potential target market. In business it is key to identify who is your ideal customer and how the goods or service provided can alleviate their problems (Beth Worthy, 2021) Voi Technology states in their vision plan that their service can be used for all (Voi, n,d) This shows that Voi Technology has a target market. Worthy also describes value proposition to be an important metric. This metric is extremely important to young businesses as it is used to measure the product against rivals within the same industry. This is done by showing how your product meets your customer’s needs (Beth Worthy, 2021). Voi Technology claims the top spot of Europe's micro mobility sector with safe and robust vehicles out in cities, understandable for all application and smart operational service. These smooth workings are delivered as Voi Technology owns all aspects of their own service, from back end to front end. This allows Voi Technology to track every single piece of data and improved constantly (Technlogy, n/a)

For this research the Priori business model can be applied and implemented. This allows Voi Technology Turku to list critical success factors and how to measure those factors.

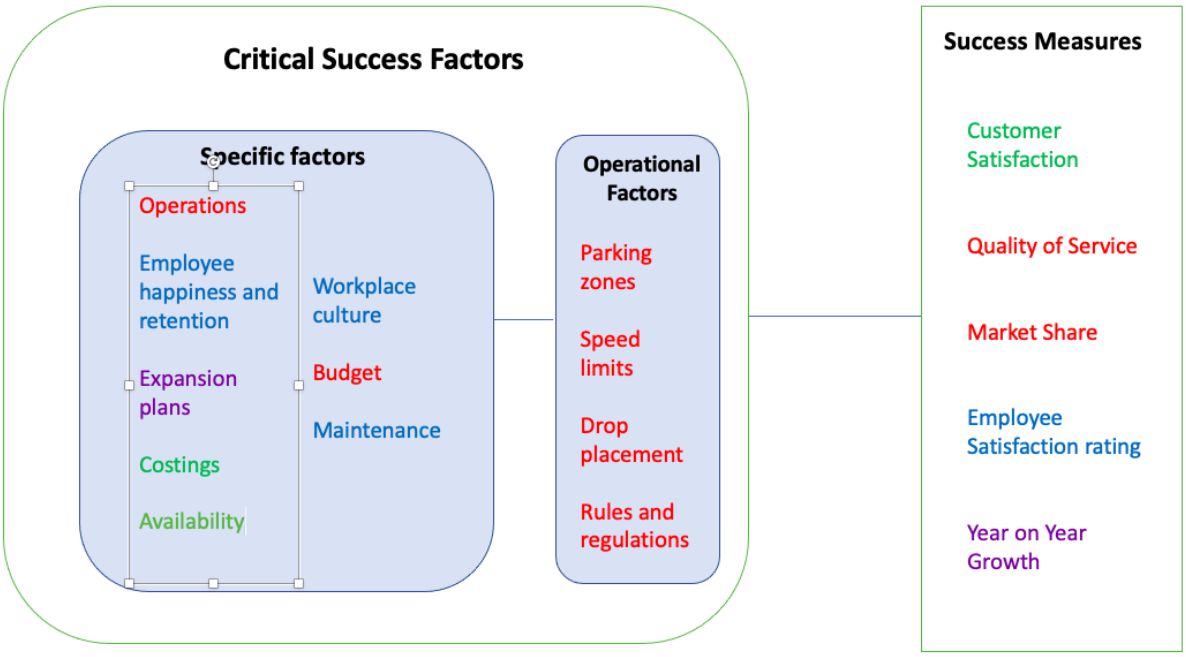


Figure 1. A Priori business model

A Priori business model was created for a literature review of which allows one to list a whole set of critical success factors alongside measures of success (Wasana Sedera, 2004)

The determined list of factors for the Priori business model based on research that has been carried out during interviews and the survey. From the research it could be determined that these are the critical success factors and critical success measures.

Critical success factors in this framework are described as factors that need to go right to allow the success measures. For example, without success in operations you would not be able to dominate market share, which is key to success for Voi Technology Turku. This is to be found out from interviewing Turku's fleet manager.

CHOSEN RESEARCH METHOD

This research paper will contain research into Voi Technologies operations in Turku and how the company in Turku is able to successfully operate. There are many intangible factors into the workings of a micro mobility company, and this research will

showcase how that is formed. The chosen research methods will be 5 interviews alongside a questionnaire. There will be interviews conducted with.

Site Manager, Turku

With interviewing Turku's site manager, there will be a deeper insight into the running of Voi Technology Turku's warehouse. There will be an investigation into

- Fixed costings
- Variable costings
- Day to day warehouse operations

Fleet Specialist, Turku

This role in Voi Technology Turku is used to fix e-scooters in the warehouse as well as performing in field tasks within the operational zone. The interview will be about

- Job satisfaction
- Workplace culture
- Employee happiness and retention

Quality Assurance Engineer, Stockholm HQ

Interviewing this professional will allow more knowledge in the working of the e-scooter and how from an engineering perspective. The topics that will be looked at more in-depth will be

- Maintenance of e-scooters
- KPI's set out for Voi Technology Turku
- Future vision
- Current e-scooter model

Micro Mobility project leader, Turku

This interview will look from the perspective of an employee from Turku city council. This employee allows an angle from the perspective of the city and the collaboration in which Turku city shares with Voi Technology Turku. There will be further research into

- Speed limits
- Expansion plans
- Further infrastructure investment

- Past problems and future solutions

Fleet Manager, Finland

With this role the aim is to discuss all operational aspects of Voi Technology Turku's day to day operations including

- Drop placement (how the company discover where to place scooters)
- Speed limits, slow zones, and mandatory parking zones
- Partner companies
- Competitors

These people have been chosen for their knowledge and understanding of Voi Technology along with knowledge from Turku city and the regulations in the city. There are a variety of expertise chosen from these professionals which in turn will allow the reader to have a well-rounded and an unbiased perspective.

Alongside these interviews there will be a customer survey of 25 participants to gain insight with Voi technologies target audience as to why the users of the service consider it to be successful. This survey will be looked at from an operational point of view and aims to prove Voi Technology Turku's customer relationship management and how Voi Technology Turku operates with their target market. The survey is to be found in section five of this research paper.

The questionnaire will aim to prove Voi Technology Turkus success factors in the following

- Market share
- Customer satisfaction
- Usage

3 WHAT IS SHARED MICRO MOBILITY & E-SCOOTERS

According to Merriam-Webster micro mobility is defined as a way of travel over small distances, usually carried out on single person vehicles, such as bicycles, scooters, or skates (Merriam-Webster, 2000).

Micro mobility can allow us to travel with these methods individually, but also allowing us to access trains and buses more easily as a connecting mode of transport. One main goal of micro mobility is to allow cities to reduce global emissions and reduce their impact on the ever-growing climate crisis (Voi Technology, n.d.).

Shared micro mobility allows different mode of transport for residents of cities, people looking for connections to public transport links and people who are not able to have personal vehicles (Susan Shaheen, 2021)

Shared e-scooters started in California in 2017 and it has rapidly turned into a multi-billion-dollar industry with huge brands including Google and Uber, who invested heavily in tech start-ups (ukscooters.co.uk, 2022).

Carbiketech.com describes an e-scooter as a vehicle with two wheels and is purely electric. The two wheeled vehicle does not have to use traditional combustion engine or typical fossil fuels to run, including diesel or petrol. While not powering itself with these forms of power the e-scooter uses electricity to power itself. Storing energy in a battery to use for its own power. An e-scooter can be called an e-scooter when it uses electricity to power itself (CarBikeTech , 2021)

Voi Technology describes getting started on a shared e-scooter in four easy steps (Technology, n/d)

1. Get the application and create an account
2. Locate a nearby vehicle on the map
3. Unlock the vehicle by scanning the QR code
4. Hop on and get to cruise around

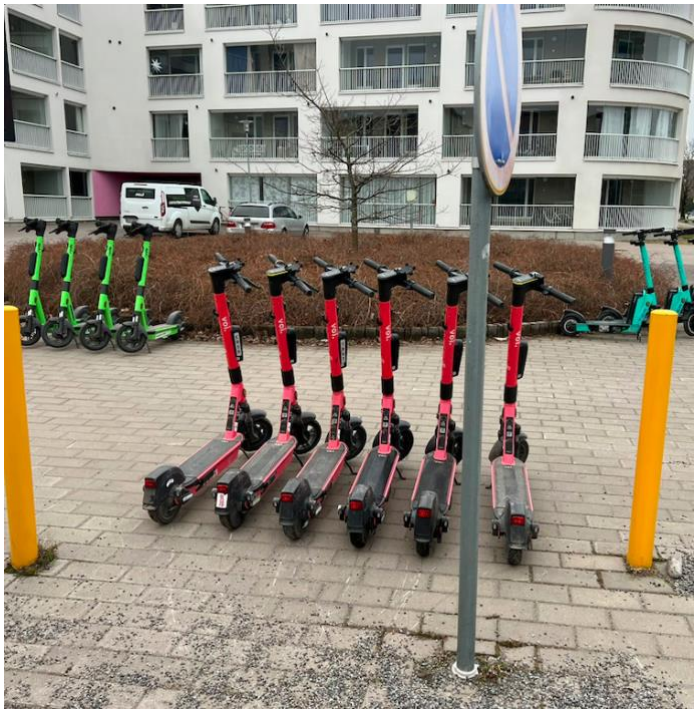


Figure 2. E-scooters ready for rental in Turku

Figure 3. E-scooters ready for rental in Turku

4 ABOUT VOI AND BACKGROUND

Figure 4. Voi Technologies background

Voi was founded in 2018 by four tech experts and entrepreneurs. Voi technology believes strongly that cities should be free from noise, congestion, and pollution and that each citizen should be able to move freely (Voi, n,d)

Voi is a Swedish based shared micro mobility operator. The company offers the services of rented electric scooters known as e-scooters or electric bikes also known as e-bikes. Voi is the largest shared micro-mobility operator in Europe, and it boasts well over a million weekly rides. Over 100 cities across Europe now call Voi home and this number is constantly growing (Voi , n,d)

Voi Technology plays a huge part in the European micro mobility industry. Founded in Sweden, Voi Technology is a market leader in modern hardware and software solutions. Voi Technology aims to deliver sustainable transport and development of urban areas.

EU startup.com states Voi technology as a start-up that in and around urban areas is allowing the use of electric powered scooters. The main goal of Voi Technology is to help the people of cities to commute, with a fun and affordable mode of transport and to help people and cities reduce their carbon footprint (EU startup, n,d)

On 20th July 2023 Voi Technologies blog post on their official website shares the exciting news that Voi Technology operates in 100 cities, across 12 countries with more than 100,000 vehicles amassing more than 195 million rides (Voi, n,d) Voi technology boasted a revenue of 927 million euros in 2022 and currently has over 7 million different

users. For the year of 2023 Voi Technology aimed to improve the efficiency of their operations to allow a higher gross margin. (Voi, 2023)

4.1 VOI TECHNOLOGIES HISTORY IN TURKU

Voi Technology Turku currently operates approximately 2700 scooters in Turku. Voi Technology has operated in Turku since 2019 (Siiponen, 2023). According to the fleet manager of Finland, Raphael Rosito, the early days of Voi Technology in Turku was all about scaling up. Voi Technology started with around 400 e-scooters. The success rate was measured by ride numbers and constant growth. The market was unsteady and fragile, but Voi Technology was prepared for the journey ahead. 2020 saw Voi Technology grow in Finland and invest into newer vehicle models and a higher number of vehicles (Rosito, 2024)

Braden Smith, Quality assurance engineer, is stating in his interview. As of today, 2024 Voi Technology in Turku is operating a successful business model boasting 2700 vehicles on the streets with very limited downtime. The current vehicle model in Turku is going into their third straight year. Proving that there has been a success in the way that Voi Technology Turku maintains and operates their vehicles (Smith, 2023)

Voi Technology operate in four Finnish cities

- Helsinki
- Tampere
- Turku
- Jyväskylä

In terms of ride per ready vehicle (RVD) Turku ranks top in the four Finnish cities that Voi Technology operates in. Voi Turku is the most profitable city in Finland, largely due to high RVD and TVD (Rosito, 2024)

Voi Turku started out in 2019 with a core staff of four people and originally, there was no organizational structure to the warehouse operations (Salomäki, 2024) To this day Voi Technology Turku employs six permanent employees and four fixed term contract employees. With roles varying from fleet specialist, site manager, fleet manager and central operations manager. The operation in 2019 was a start-up that had common

operational mishaps. Like many other newly founded e-scooter companies, it was a case of dropping vehicles in the city and let the problems iron themselves out. There were many problems in the early days, some of which are:

- Low battery range
- Fixed batteries (had to go to warehouse to charge)
- Low fleet numbers
- Early-stage technology that was easily hacked
- Smaller scooters that were easily placed into the river
- Low number of employees

2024 can see a lot of improvements

- 100 km battery range
- Swappable batteries (can be swapped on the street)
- Well calculated fleet size
- Scooter is more robust so can go longer between maintenance periods
- Deep coded firmware that is extremely difficult to hack
- Calculated number of employees that allows work to be carried out on time

With great insight into the history of Voi Technology and how operations have improved over the years, this is a fast paced sector with an ever changing market (Rosito, 2024)

4.2 VOI TECHNOLOGIES TURKU OPERATIONS'

Voi Technology describes high season to be from April until October (Rosito, 2024) Within this season Voi Turku must make a high revenue to cover themselves through the Nordic winter. With naturally less rides and customer base in the winter. Voi operates in Turku with help from a third-party company (3PL). The 3PL in Turku takes care of tasks that are high priority and needed around the clock. Some of these tasks include:

- Battery swaps
- Re-parking wrongly parked vehicles
- Re-balancing scooters to area of demand

The 3PL works on a contract base and gets paid from Voi Turku for every task performed. Meaning that Voi Turku needs the vehicle to go as far as possible without needing a task. This way each vehicle is maximizing profit margins (Smith, 2023)

Voi Technology is currently using the largest capacity battery in Turku meaning that the company can have more rides before the battery needs to swapped with a fully charged battery. Thus, giving Voi Technology Turku an operational advantage over the competitors in the market (Smith, 2023)

Voi Turku has a centrally located warehouse and fixes between 150-200 vehicles per week in the high season. Voi Turku employees six people year-round and an additional four people through the high season (Salomäki, 2024) Working alongside the 3PL Voi Turku tries to when they can perform as many of these in field tasks as possible, this is a great way for Voi Turku to increase success. Each season Voi Turku has been taking on more in field tasks and now performs

- In field quality checks
- Transport of broken scooter to the warehouse for maintenance
- Deploying fixed scooters from the warehouse back to the street
- Planned day time battery swap (Rosito, 2024)

4.3 VOI TECHNOLOGY TURKU'S FUTURE

The Vision of Voi Technology is to provide a clean and convenient alternative way to move around big cities and towns. E-scooters can be part of the solution for municipalities to become a pollution free environment for people to live and move around freely (Brenner, 2020). Voi Technology also believes that the clean micro mobility solution is shared amongst the local authorities in operating cities. Both parties are focusing on sustainability and safety as a foremost issue (Brenner, 2020). Voi is prioritizing inner sustainability, focusing on reducing further their already low environmental impact by streamlining operations (Brenner, 2020)

Turku is no different to the companies' sustainable goals, operating with an electric van, minimizing e-scooter transport, and introducing in field quality checks on e-scooters. The success of Voi Turku is down to a hard-working team that strive forward to make e-scooters the best they possibly can be (Salomäki, 2024). According to Janne

Leppanen, Fleet specialist in the Turku warehouse team, Voi Technology Turku is also successful due to their working culture which allows the employees of Turku to operate flexibly with great working benefits (Leppanen, 2024)

Voi Technology has three main slogans for their brand

- Ride Together
- Build with empathy
- Push boundaries

Voi Technology translates ride together into strength of diversity. Voi Technology states that they win together and learn from losses. Feedback is an everyday task in the Voi office and plays a role in employee culture and satisfaction. This is how Voi Technology claims to “grow” (Voi Technology , N/A)

5 MAIN PROBLEMS & SOLUTIONS SURROUNDING E-SCOOTERS

With any new business, increased usage increases problems, with e-scooters the main problem is the structure of parking and general clutter. Politico.com stated that Voi's hometown of Stockholm, Sweden is introducing strict new regulations with heavy enforcement on parking with a huge introduction on mandatory parking zones. Stockholm has cut the number of e-scooters on their street from 23,000 to 12,000 (Duxbury, 2022)

Politico.com reports that in the Belgian municipality of Uccle wants to remove all scooters from the streets. It is said that e-scooters are essential to the way that Belgians move around Brussels. However, with 20,000 scooters it has become a jungle. Along with many other cities and municipalities Brussels has introduced mandatory parking zones (Preussen, 2022)

The Guardian UK a well-established news outlet talks about the ban of rental e-scooters in Paris, France. The end of August 2023 will see Paris become the first major city to ban rental e-scooters, forcing all operators to remove all their vehicles from the streets. Paris was in 2018 the first European city to allow the use of e-scooters. (Chrisafis, 2023)

Raphael Rosito says in his interview that 2019-2020 was full of "operational problems" there was a need for this service, but the cities were not ready, neither were some of the cities' residents. 2019 saw a lot of scooters lost to the river and vandalism, with a light scooter model in the beginning and the ease to move without unlocking the scooter made "throwing them in the river" a big problem for Voi Technology Turku. But clever engineering both in software and hardware along with no parking zones has drastically decreased the number to this current day (Rosito, 2024)

Voi Technology Finland, donated voiKala a "little helper" to aid the diving rescue operation in Turku and aided with the clearing of the riverbank. Voi Technology Finland, was urging residents to help with the cleaning. Voi Technology was piloting a new and innovative way to help underwater divers in the Turku area by donating voiKala (voiFish). This small underwater drone will help divers locate e-scooters alongside other debris. (Voi Technlogy, 2021)

In an interview conducted by Voi Technology with local diving activist Jouko Moisala. Moisala quotes that ““Thanks to the sonar function, we believe that it will also be useful for us both in the river and in the sea” (Moisala, 2021)

Figure 5. voiKala next to the Aura river, Turku

In an interview from Jere Sipponen, Turku’s project coordinator it can be seen that Turku is very clear about the future of micro mobility. Turku has great relationships with operators and will continue to grow alongside operators. Exploring options that will allow both the city to evolve and the industry. It is clear from the interview that Turku city is serious about micro mobility and the use of e-scooters within the city. Over the previous two years Turku has added numerous marked parking bays and has found that to be a huge success in terms of e-scooter parking. Turku city has introduced parking racks in parking hot spots. Turku city has invested in micro mobility infrastructure over the last years and has plans to invest further (Siiponen, 2023)

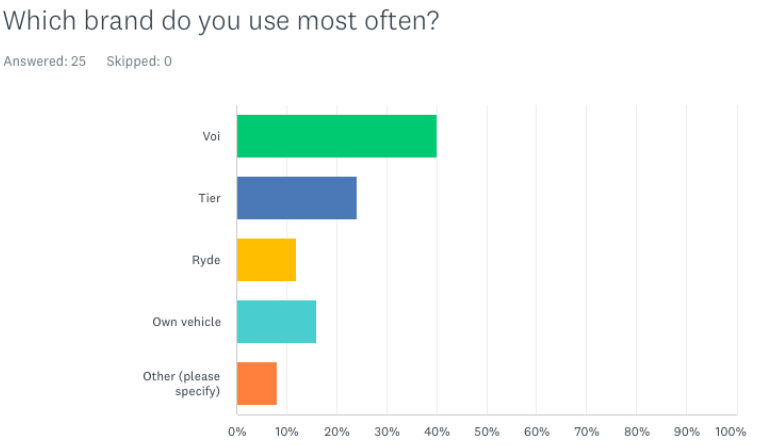
In the summer of 2023 Turku city introduced a “scooter patrol” in conjunction with e-scooter operators. Turku city would work closely with both the scooter patrol and e-scooter operators to gather information that would allow better decisions to be made in the future (Turku City , 2023)

There has been a huge problem with e-scooters and to some respect there still is, but there is a definite upward trend that these problems are being ironed out due to careful

collaboration and constant new technology. Tero Salomäki says that Voi Technology in Turku has seen a drastic improvement in vandalism on their vehicles, and a decrease in the number of vehicles needing to be rescued due to people hiding them. (Salomäki, 2024)

6 QUESTIONNAIRE

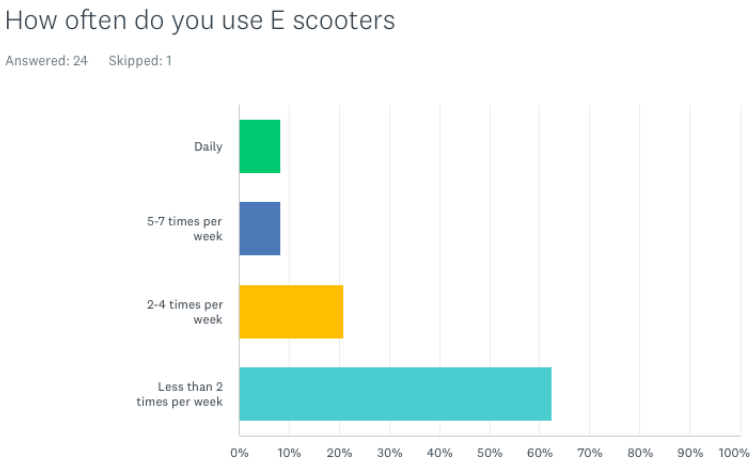
This questionnaire had a sample size of 25 participants. This questionnaire was executed anonymously, only knowing that the participants were students at Turku University of Applied Science and in the demographic range of e-scooter riders. There was a goal for the questionnaire to be under 2 minutes long to make sure all participants would participate successfully. This was achieved by targeting the most relevant five questions for in-depth research. Based on the findings 40% of e-scooter users choose Voi Turku. Availability has been the main driving factor for consumers riding Voi Turku's e-scooters. This theory backs up the interviews stating that Voi Turku's operations are successful.



ANSWER CHOICES		RESPONSES	
Voi		40.00%	10
Tier		24.00%	6
Ryde		12.00%	3
Own vehicle		16.00%	4
Other (please specify)	Responses	8.00%	2
TOTAL			25

Figure 6. 1st survey question

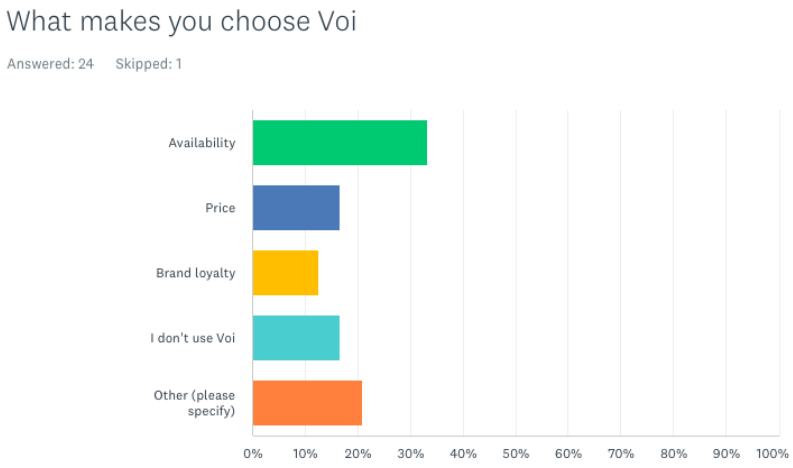
This is question was used to determine the number of riders that use Voi Technology Turku, in-turn allowing the reader to determine Voi Turku's market share against their competitors. Voi Turku claims 40% of market share based on this survey. This is a significant market share and allows Voi Turku to claim top spot in Turku.



ANSWER CHOICES	RESPONSES	
Daily	8.33%	2
5-7 times per week	8.33%	2
2-4 times per week	20.83%	5
Less than 2 times per week	62.50%	15
TOTAL		24

Figure 7. 2nd survey question

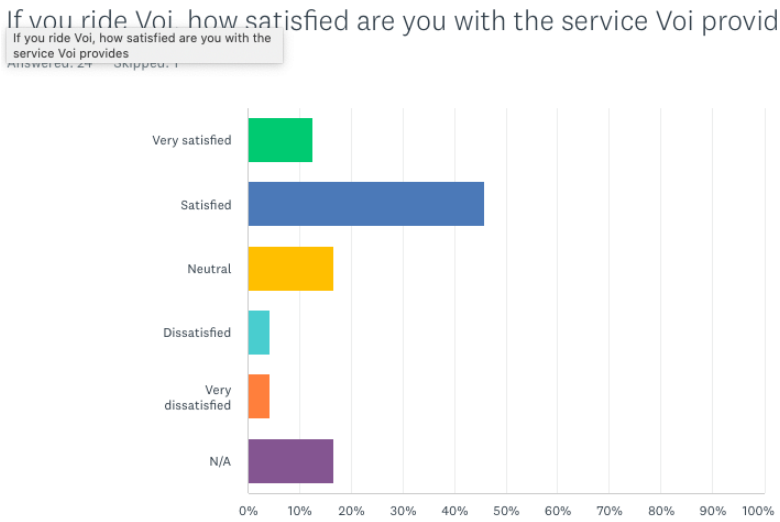
The aim of this question was to gain insight to how many e-scooter users use scooters as their main mode of transport, or how frequently the e-scooters are used. We knew that all the participants of the survey use e-scooters at least once a week as we had already filtered out the results of participants who do not ride e-scooters.



ANSWER CHOICES		RESPONSES	
Availability		33.33%	8
Price		16.67%	4
Brand loyalty		12.50%	3
I don't use Voi		16.67%	4
Other (please specify)	Responses	20.83%	5
TOTAL			24

Figure 8. 3rd survey question

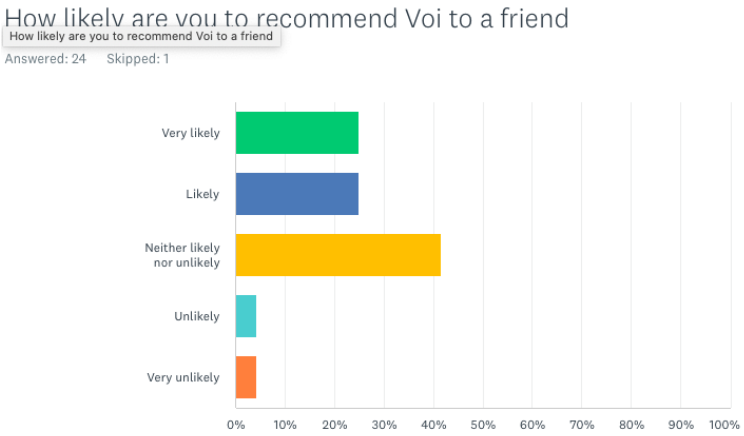
This was a key question, and a question that allows the definition from a customer's perspective to say that a large part of Voi Technology Turku's succession is down to their availability, which translates into operations. Voi Turku's fleet manager says that availability is a key factor to dominant market share (Rosito, 2024)



ANSWER CHOICES	RESPONSES	
Very satisfied	12.50%	3
Satisfied	45.83%	11
Neutral	16.67%	4
Dissatisfied	4.17%	1
Very dissatisfied	4.17%	1
N/A	16.67%	4
TOTAL		24

Figure 9. 4th survey question

This question was to measure customer satisfaction as customer satisfaction is also another key metric for success based on the Priori business model. The survey concludes that over 58% of users are more than satisfied with the service that they are provided by Voi Technology Turku.



ANSWER CHOICES	RESPONSES	
Very likely	25.00%	6
Likely	25.00%	6
Neither likely nor unlikely	41.67%	10
Unlikely	4.17%	1
Very unlikely	4.17%	1
TOTAL		24

Figure 10. 5th survey question

The final question in the survey was also about measuring customer satisfaction levels, as if you would recommend Voi Technology Turku's service to a friend that is a positive factor for Voi and another measure of success

7 INTERVIEWEES EXPLAINED

In the introduction it is mentioned that one of the research methods are interviews and this section contains the four interviewed employees from Voi Technology alongside Turku cities' project leader for micro mobility. The roles in which were interviewed were:

- **Fleet manager, Finland**

This role is responsible for all e-scooters in Finland and how the operations are handled out in the field. The fleet manager is responsible that operational KPI's are met from a worker standpoint

- **Site manager, Turku**

This role is to maintain the day to day running of Turku's warehouse and how the warehouse operates. This role needs to organise staff, control inventory, and take care of running costs allowing Turku warehouse to remain within budget.

- **Fleet specialist, Turku**

This role is a worker with no one who directly reports to them. The fleet specialist has weekly KPI's to meet. Fleet specialist is responsible for carrying out maintenance on vehicles inside the warehouse and performing tasks on the street when is needed from the Fleet manager.

- **Quality assurance Engineer, Stockholm HQ**

The key purpose of this role is to maintain and develop SOP's to allow warehouses and vehicles to operate more efficiently. The QA engineer also will set KPI's to the vehicles, operational tasks, and fleet specialist to ensure Voi Technology is gaining the best from their fleet.

- **Turku city micro mobility Project Coordinator**

This role works closely with e-scooter operators in Turku and their main goal is to develop long lasting relationships and to also allow and aid the growth of micro mobility in Turku.

8 MAINTENANCE AND KEY PERFORMANCE INDICATORS

The current vehicle model in use in Turku is called V4 model, the V4 has several important positive features such as, these features give an operational advantage over competitors (Smith, 2023)

- Large battery
- Turn signals
- Lift handle
- State of the art GPS system

The large battery allows Voi to operate for longer without needing a swap task, we know from R&D that Voi Technology operates with a larger battery than its competitors, allowing a Voi e-scooter to be travelled on further before swapping as opposed to a competitor in the Turku area, this gives Voi an operational advantage over competitors (Smith, 2023)

Quoted from quality assurance engineer in an interview “The rides per task is a super important internal KPI. It tracks how many rides each scooter gets before any task is created or assigned to the scooter. Because Voi pays for tasks and only collects revenue on rides, they need a large number of rides before a task is created. For example, if we would only have **X** rides per task, and thus **X** revenue per task and we know the average task costs **X** euros: then we can quickly see how profitability we are operating through this KPI” (Smith, 2023)

With the usage of current vehicle in Turku the`` Voiager`` 4. Voi Technology says that a lifespan of 5+ years is possible with this vehicle. The vehicle has been equipped with multiple sensors, allowing Voi to track riding behaviour and create pre-emptive maintenance according with the usage of any said vehicle (Voi , 2021)

Site manager of Turku says that maintenance and pre-emptive maintenance is a key factor to Voi Turku’s success, allowing the vehicles to be fixed when needed and to fix what will be needed in the short term future while the vehicle is in the warehouse is a great way to make sure you are getting the most use out of the vehicle between tasks (Salomäki, 2024)

Figure 11. Voiager 4 model

9 E-SCOOTER OPERATORS IN TURKU

Turku city says that e-scooters are a great way to get around in downtown Turku. The whole are of Turku city is reachable and the city claims that the e-scooter can be left practically anywhere (Turku City , 2021).

The three Micro mobility operators in Turku can be seen in the table below. Turku is a key player in the micro mobility industry and boasts huge ride numbers throughout high season, surpassing 10,000 daily rides in the peak of high season (Rosito, 2024)

- Voi Technology (Swedish)
- Ryde (Norwegian)
- Tier (German)

Table 1 : Detailing pricing structure for all shared e-scooter operators in Turku

	Voi Technology	Ryde	Tier
Unlock fee	1	1	1
Minute fee	0.25	0.25	0,23
Day pass 60 Minutes	4,99	4,99	5,99
14 Day pass 200 Minutes	n/a	19,99	n/a
Monthly pass 300 Minutes	29,99	29,99	n/a
Monthly pass 750 Minutes	64,99	64,99	n/a
Unlimited Monthly unlocks	2,99	2,90	4,99

All prices are in Euros and were taken from each operator's mobile application (2024)

From the table above we can see that Tier have the cheapest rates, but according to the graph below and our research still do not hold the most market share, meaning that consumers are not always chasing the lowest price in the e-scooter industry. Brand loyalty, vehicle placement and reliability are key factors to market share as supported by the survey carried out

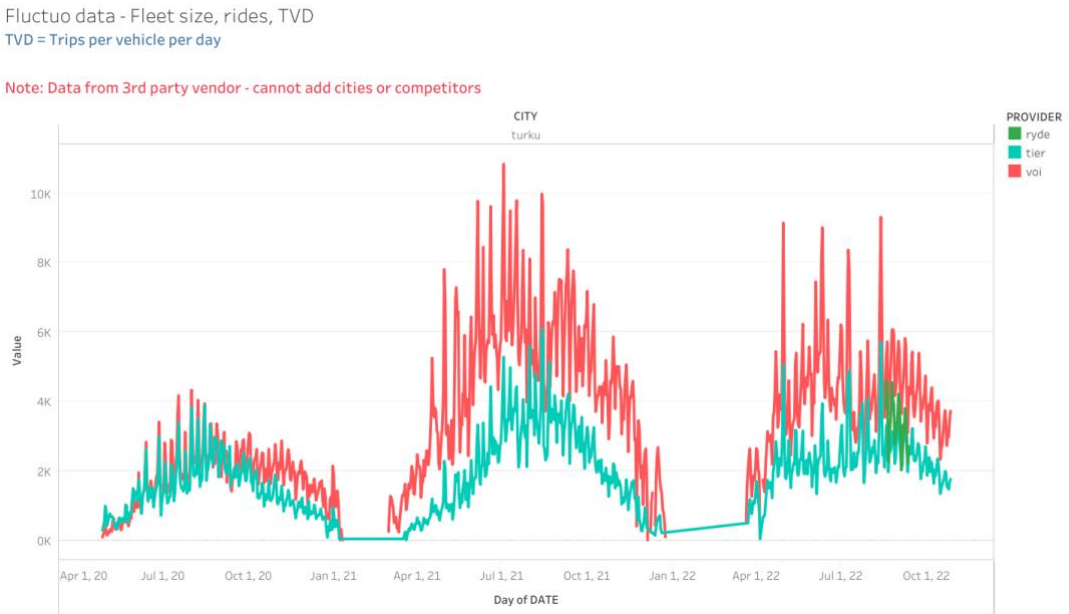


Figure 12. Daily ride data

Micro mobility companies in Turku upload their ride data to the city of Turku weekly and the city creates a graph demonstrating the market share within the city. We can see from this graph that Voi technology has a large portion of the market share and a high total of daily rides. These are two combining factors in Voi Technologies success in Turku. From the above table there is a significant difference in the pricing and then pricing structure offered. All three operators operate with an unlock fee. This fee that must be paid to “unlock” the e-scooter, meaning for the e-scooter to become operational you must pay the unlock fee.

Voi and Ryde offer the largest selection of passes and Tier only offers a day pass and a monthly unlock fee. “We believe that this is down to Tier’s financial struggles and the reduction of their operations” says Raphael Rosito Voi Technology Finland’s fleet manager.

Voi and Ryde are very competitive in terms of pricing structure and market share.

Braden Smith says in an interview that Ryde operate in Turku with a “V6” model. This model is two years newer than the “V4” model in which Voi Technology operates currently with in Turku (Smith, 2023) From the questionnaire that was conducted, even with older models, same pricing structure, and similar fleet size Voi Technology is the consumers brand of choice. That has been researched to be down to availability.

9.1 OPERATIONAL COSTINGS

Voi Technology in Turku have many fixed and variable costings (Salomäki, 2024)

Fixed costs

- Warehouse rent
- Salaries
- Electric
- Van lease
- Rubbish removal
- Internet and mobile phone

Variable costs

- 3PL costings
- Spare parts
- Marketing campaigns
- Refunds
- Tool replacement or investment in new tools
- Personal protective equipment

These costs are consistently monitored by operational managers and Voi Technology Turku remains within a budget range. Not overspending is another key to Voi Technology Turku's success rate (Rosito, 2024) One of the largest operational costs for Voi Technology Turku is 3PL costings, the money in which is paid to a partner company to perform on the street tasks. This is something the Voi Technology is constantly trying to minimize and work towards a hybrid approach in which some of the operational costings would move in house and fleet specialists would take on larger in field duties (Salomäki, 2024)

10 CONCLUSION

This research has found out that Voi Technology Turku operates successfully largely due to their operational structure. The Turku team has a very clear and precise workflow allowing maximum allocation of all available vehicles. The team quickly turn around broken scooters minimizing downtime. Voi Turku keeps the backlog of broken e-scooters well below the company threshold of 2.5 %, majority of the time Turku is operating close to 1% (Salomäki, 2024) Voi Turku has a great relationship with city officials, working closely together to implement, no parking zones, mandatory slow zones and even donating parking racks to the city (Siiponen, 2023)

It is proven that all these facts together contribute to Voi Technology in Turku being successful. There is not one specific reason as to why Voi Technology Turku is successful but based on the research it is a combination of all the operations, maintenance, workplace culture, relationship with the city and a peak high season in Turku.

Voi Technology has a range of metrics to develop their success. They are forerunner in the e-scooter scene in Turku and have managed to maintain a key market share throughout the five years they have been operating in the city. The team in Turku has a low turnover of staff and often lead to employees being promoted to higher roles in the company (Rosito, 2024) This can measure success from an employee happiness rating. Interviewing a fleet specialist who has been at the company for three consecutive high seasons, we understand that even temporary contract high season workers keep returning (Leppanen, 2024) Voi Technology Turku has one of the lowest spare part costs per e-scooter, which goes to show that Turku uses spare parts wisely and fixes the parts wherever possible (Salomäki, 2024). This means that the team can operate on very small margins and maximize revenue to go further. Along with maximizing revenue, Voi Technology Turku has great ready vehicle numbers which allows the largest possible number of scooters out on the streets at any given time.

There is no doubt that travel trends are changing in the way that favours micro mobility. There is a huge customer base which ranges from students to working professionals. Cities have goals of becoming carbon neutral and micro mobility is here to help that.

This research has proven that Voi Technology is successful based on the factors that have been described in the Priori business model, however there is belief and need for deeper research to really alleviate pain points and focus on cities becoming more efficient, with the allowance for the city to work in harmony with the e-scooter and the operators. For example, creating assigned mandatory parking zones to avoid clutter and general disturbance within pedestrian pathways. There could be research into the amount of MPZ's needed per square meter or inhabitant while maintaining customers satisfaction for availability and meeting the operators targeted walk time of less than two minutes per vehicle.

Jere Siiponen states that it is the will of Turku city council that e-scooters and micro mobility is here to stay. Turku city will invest in the handling of micro mobility. Finland will have new legislation around e-scooters by the year 2025 (Siiponen, 2023)

From the research it can be concluded that Voi Technology in Turku is a successful company. There is a need for this service and Voi Turku can combat that need with availability, as shown from the questionnaire. Insight was gained into Voi Technology Turku's operations, and it can be seen through the interviews that there are successful operations allowing Voi Technology Turku to operate with very thin margins, but still come out as a top market share holder in Turku.

There is continued growth within the business and there is a significant market share. The company values its employees and has a great workplace culture. It is believed from the research that the travel trends are changing in a way that favours micro mobility and Voi Technology will be a player in the way people move around the city of Turku for years to come.

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APPENDIX

Interview Dialogue

Fleet Specialist, Turku.

Name: Janne Leppanen

How long have you worked at Voi Technology Turku?

This will be my third summer season working for Voi Technology Turku

What keeps you coming back?

The working Culture at Voi is fantastic, I feel valued as an employee, and I feel that is a contributing factor to Voi Technology Turku's success.

Would makes you feel this way?

As an employee I get sports and benefit bonus to use for my leisure outside of working hours, I get flexible working structure and also, I get to improve my personal skills with one of many courses Voi offers through their in-house training program.

In your opinion what makes Voi Technology Turku a successful company?

Culture, operations, and professionalism would be the words I would use to describe Voi's success.

Quality Assurance Engineer

Name: Braden Smith

´´Position in company: Quality Assurance Engineer"

How does the current vehicle model in Turku allow Voi to operate with a positive profit margin?

"The current vehicle model in Turku is our V4 model. The V4 has several improvements on many fronts such as safety, operations, repairs.
An example(s) on each front is:
Safety: Turn signals

Operations: Larger battery (few swaps), improved GPS, lift handles.
Repairs: Improved software for pre diagnosis, and automatic firmware updates”

What is the KPI (rides/task)?

“The rides/task is a super important internal KPI. It tracks how many rides each scooter gets before any task is created/assigned to the scooter. Because Voi pays for tasks and only collects revenue on rides, we need a large number of rides before a task is created. For example, if we would only have x rides per task, and thus x revenue per task and we know the average task costs x euros: then we can quickly see how profitability we are operating through this KPI”

What factors influence the rides/task KPI?

“Great question Matthew. This is another reason why this KPI is so important to Voi because tasks can be created for several reasons and thus nearly everybody in the company has some impact.
For example:
We are currently using the largest capacity battery in Turku, meaning that we can have more rides with that battery before we need to swap it. Thus, giving us a profitability advantage over our competitors.
There are tasks created around repairs, therefore we want to make sure they are fixed to the highest quality standard for safety, of course, but also to maximize the number of rides between repairs.
We also have geo maps to ensure the scooters stay in more populated locations and thus avoid having to be rebalanced”

Will Voi upgrade the scooter model in the future?
“Yes, our Voiager7 is under development with safety and profitability being the top priorities. We are expecting to see our rides/task significantly increased with our V7 model”

What could be done with the vehicles to allow Voi Turku greater profitability?
“There are a range of answers to this question, but we are looking into the example

cases in the KPI question.
The short answer for Turku profitability is to increase the lifespan of our V4 model as each market is responsible for the depreciation costs. Those if we can extend and exceed that depreciation time our profits become much better”

What could be done with the vehicles to allow Voi (TURKU) greater profitability?

There are a range of answers to this question, but we are looking into the example cases in the KPI question.
The short answer for Turku profitability is to increase the lifespan of our V4 model as each market is responsible for the depreciation costs. Those if we can extend and exceed that depreciation time our profits become much better.

Micro Mobility project leader

Name: Jere Sipponen

Position/Role

Project Coordinator

How have micro mobility rules in Turku changed over the years?

“We got first e-scooters to the streets 2019, but our first projects and measures related to e-scooters are made in 2021. In this point the measures what I mean is for example parking facilities for e-scooters. In 2021 we had 13 locations for parking and then we have expanded those in these years, so now (year 2023) we have approximately 500 places in 60 different locations for parking. We also got racks for the parking funded by the operators”

Are there any changes coming to regulations that could seriously hinder operations?

“From the national level there might come mandatory traffic insurance for the e-scooters which are heavier than 25 kg. Also, there might come alcohol limit for the micro mobility vehicles same as cars 0,5 permilles. As a city, we might add some new NPZ or slow speed zones for the next year, but those will not affect seriously to operations”

How has Turku gone about tackling parking clutter?

´´We have set NPZ to the city and we have painted parking spots for e-scooters since 2021. In this year we had also parking patrol which moved wrongly parked scooters to better locations and also mapped us locations for the future measures. We also got 8 racks for the e-scooters as a cooperation with the operators, to get place for the racks we took 3 car parking spots away.´´

Do you see Micro mobility here to stay?

´´Yes of course and it’s our will, but we would like to get more tools for the city to handling this scheme. We hope that we will get the legislation for the micro mobility latest in 2025.´´

What have operators done in conjunction with the city to assist with key problems?

“They have set the NPZ, slow speed zones and no-go zones for the e-scooters. They have also paid 2 of 3 our parking patrol and they gave us racks for the parking. I think we have a good cooperation with the operators just now and we hope that it will continue the same way”

How is Turku Cities infrastructure prepared for the growth of Micro mobility, or do you feel that there would need to be modifications and investment to further the growth of Micro mobility in Turku?

“I think it has getting slightly better, but we have still a lot to do or improve. We have found a good places for the micro mobility parking, but cars take more street space than needed and that is something that we are trying to tackle to get more space for micro mobility. We are also waiting tram to come (maybe 2030) and some improvements are waiting that (I mean some street plans etc.). We are trying to get

some investments or fundings from the Traficom (Finnish Transport and Communications Agency) to make some improvements or plans for the future”