Smart Sustainable Cities

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Smart Water Transport

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AGORÀ

– Smart Sustainable Ferries in Turku

we bring the market to you

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1 EXECUTIVE SUMMARY

This report will review the Agorà project as a part of the Carpe Essence project of Smart Sustainable cities. Under the topic of Smart Sustainable Ferries in Turku this solution focuses on a ferry market place, that delivers services to the people living in the archipelago area.

The name Agorà originates from ancient Greece. It was a place for assembly and social living in the center of the city, where people would meet up, talk and shop. This is what we want to offer with this system as well.

The ferry aims to connect people from the city and the archipelago area offering a marketplace, where local producers can offer their products as well as offering a selection of products from the city. A library system that is connected to the library of the city of Turku is also located on the ferry. All services are complemented by a mobile app, to offer customers more freedom on how they want to use the system.

This system contributes to a more environmental friendly way of living not only because of it being powered by electricity in combination with solar power and a cooling system that utilizes the cold water from the sea, but also by bringing people closer together and giving them an alternative to using their own vehicles or other ferry systems for transportation.

This paper also touches on the possible future developments of this service by offering more services and a variation of ferries.

2 INTRODUCTION

The Agorà project is part of the Carpe Essence project and it is done for the ÄlyVESI project for the city of Turku. The aim of the project is to design innovative solutions and concepts for smart water transport within cities (ÄlyVESI – Älykäs kaupunkivesiliikenne, 2016). The project group is an interdisciplinary team consisting of students from Turku University of Applied Sciences, Hamburg University of Applied Science and Universitat Politecnica of Valencia.

The project aims to improve the quality of living of the people living in the Turku archipelago in a forward-thinking and environmentally sustainable way. Over 15 000 people live in the Turku archipelago and during summer the population grows as people from mainland come to spend time on the 8 500 summer cottages in the area (Kuntien avainluvut, 2017) and 59 % of them live on an island that has no stores (Työ- ja elinkeinoministeriö, 2010).

3 THE AGORÀ FERRY

Agorà is a concept for a ferry (Picture 1.) that has a moving market place aimed for people who live on or have summer cottages on the islands in the Turku archipelago. People who live or stay on remote islands must make long trips to buy basic groceries and the stores on the bigger islands often offer a limited variety of products. For the people living in the city of Turku the ferry would offer produce and fish from the archipelago along with interaction with the producers. That way the service expands peoples' knowledge about where food comes from and how it is produced. The selection on the ferry features organic or locally grown produce that might not be available elsewhere. There is also an option for a library service that operates in cooperation with main library in Turku. The library offers books, today's newspaper and a lounge area where people could sit down and read the papers.

Picture 1. Ferry.

3.1 Agorà Definition

Agorà is a term that originates in ancient Greece. It was a "place for assembly" that was also seen as the main marketplace. There people would gather and spent most of their time during the day.

First, it was a place of gathering, where people could hear politicians speak, see artists and participate in discussion. Later it developed to a place where all kinds of merchants and craftsmen offered their goods. (Agora, 2009.)

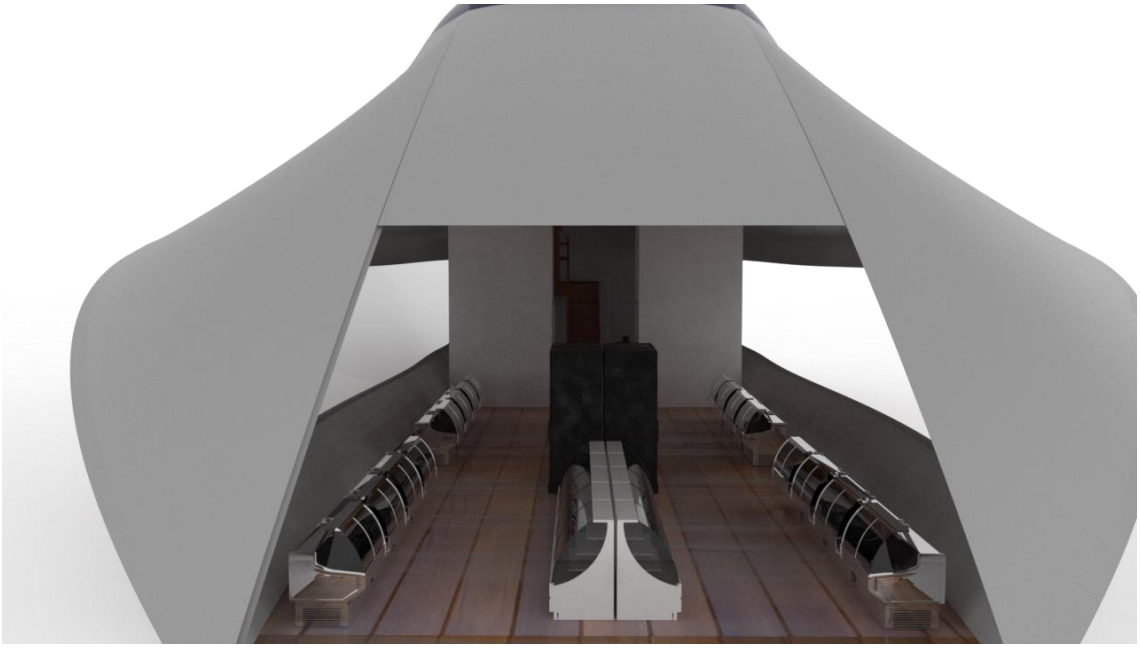
3.2 Market

The market area of the ferry is located at the ground floor. There will be stalls for products to be sold from. It will work like a supermarket area, where customers come in to browse and select their products, and then pay at the cashier before leaving the ferry.

The market inside the ferry operates on a commission system meaning producers do not sell their produce to the ferry operator, but instead allow the ferry company to sell their produce from the market. While doing so, the produce is still the property of the producer. The ferry company will keep track of all goods sold, and also make this information available for the producer. The latter can then bill the ferry company over the amount of the sold goods. All conditions will have to be decided in form of a contract, which both parties sign before working together.

The producers will decide on a price of their products onto, which is the one the ferry company will pay him for sold goods. Furthermore, the ferry company will add an additional percentage on the products, that the customer will pay if they buy this product on the ferry. The difference between the customer price and the business to business price will become the revenue for the ferry company. Any unsold produce will be returned to the producer or otherwise disposed of. Those matters are defined in the agreement (contract) between the producer and the ferry company.

The commission system is best suited for everyday goods, for which there is a consistent demand, so goods are sold. For rarer produce there will be an opportunity to preorder and prepay the products in the app and pick them up when the ferry arrives in the explicit harbor. This ensures that there would be no surplus of the more expensive products. Collaborating with local producers also ensures seasonal variety.



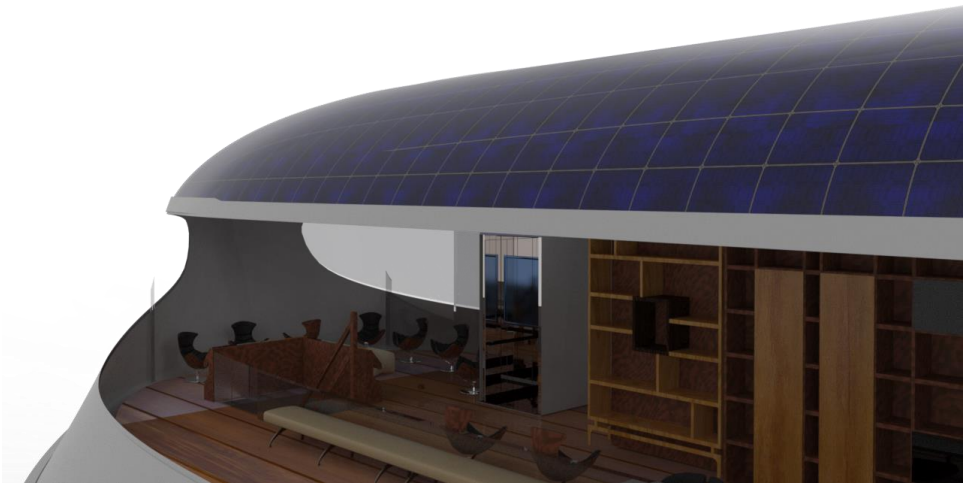
Picture 2. Marketplace.

3.3 Library

The library service works in cooperation with the main library in Turku. It will have a selection of books from the Turku library, that is changing on a regular schedule, so the people in the archipelago area have access to the whole range of the big library in Turku without going there. If a book is not currently in the ferry library system, it is possible to order it via the app that is connected to the ferry.

The library also works with the same library card as the main library in Turku, so you can access both with just one account.

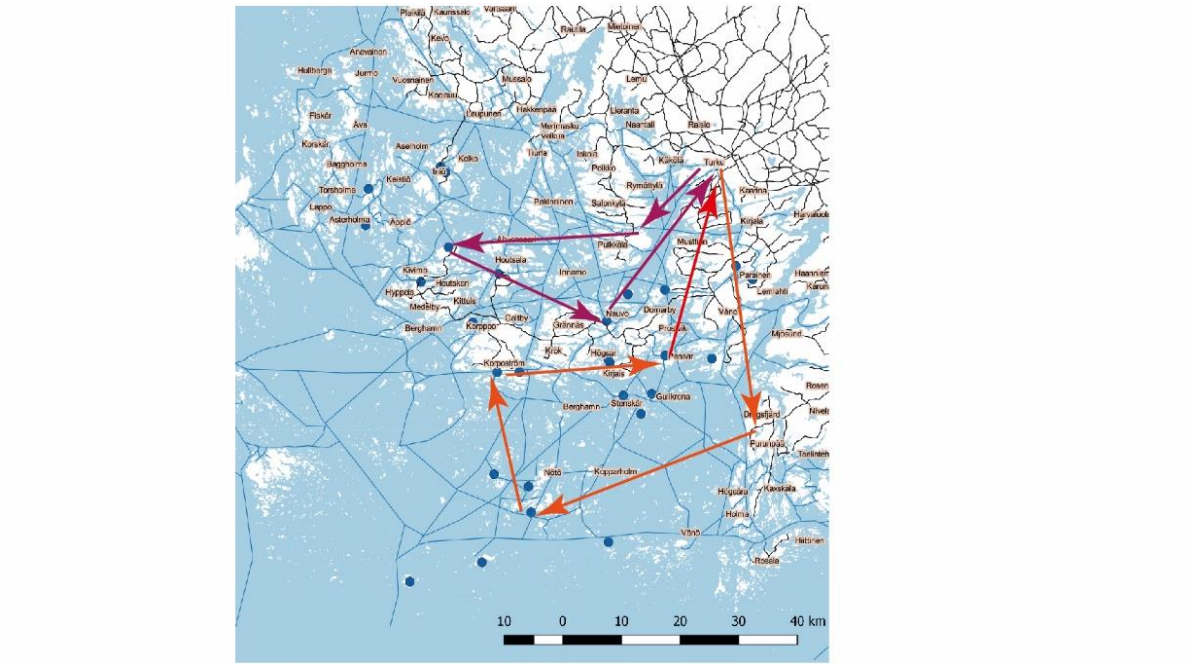
In the library there is a living area where people can read today's newspapers and admire the view from the big windows.



Picture 3. Library.

3.4 Route

To be able to reach a large customer base the ferry follows a different route each day of the week. An example of two different routes is shown in Picture 4. The route remains the same from week to week to allow the customers to get accustomed to the timetable the ferry follows. Much of the ferry route is in the archipelago but the ferry also has a stop in river Aura in the city center of Turku. Bringing the ferry to the city center serves a dual purpose to include the residents of Turku in the customer base as well as showcasing the ferry and its technology and the values it represents. On each stop, the ferry stops for one to two hours to allow all customers a pleasant and stress free shopping experience. The ferry utilizes guest harbours that are already available in the area so building new piers for the ferry would not necessarily be needed.



Picture 4. Ferry route.

The ferry app also features a timetable that is updated real-time to improve the shopping experience of the customers as well as serves as a communication channel between customers and the ferry company.

3.5 Application

A phone application enhances and supports the system of the ferry. With this application customers can check timetables of the ferry in advance and also see in real time, where the ferry is at the moment.

Customers can also order special food, that is not always in the shop, or too expensive to make available in a larger quantity. You can order the specific item that you need, pay in advance, and pick it up when the ferry comes to your stop. In combination with the pre-order system, you can see which products are available in the shop, so you can plan your shopping experience on the ferry in advance.

As well as food, you can also order books from the Turku library and see which books are currently available for rent on the ferry itself.

4 CONTRIBUTION TO A SMART SUSTAINABLE CITY

4.1. Definition of a Smart Sustainable City

According to the ITU-T Study group 5 the definition of a Smart Sustainable City is the following:

"A smart sustainable city is an innovative city that uses information and communication technologies (ICTs) and other means to improve quality of life, efficiency of urban operation and services, and competitiveness, while ensuring that it meets the needs of present and future generations with respect to economic, social, environmental as well as cultural aspects".

4.2. Contribution of the ferry for a Smart Sustainable System

59 % of the people living in the archipelago live on an island that has no stores (Työ- ja elinkeinoministeriö, 2010) and by bringing the grocery store to them it would be possible to reduce road traffic as well time needed for grocery shopping. Picture 5 shows the population density in the market area. The main focus of the service is on the areas that are less populated as there are currently no stores and hence no competition. The ferry itself is designed to work in an environmentally sustainable way using solar panels as primary energy source. If needed, there is also a possibility to charge the batteries of the ferry by electricity from the grid and charging points would be placed at the ferry stops where they could be used while the ferry is receiving customers. The environmental input caused by operating the ferry could also be reduced by installing heat exchangers that would utilize the cool sea water for cooling the produce.

Picture 5. Population density.

The distinctive nature of the archipelago is brought closer to customers and people working on the ferry by large windows on three sides of the ferry. The windows provide natural light and make the sitting areas on the ferry unique with an ever-changing scenery.

This ferry system reduces the need of people to travel with their own vehicles to get groceries or use a library service, because the ferry satisfies this need where they life. At the same time it reduces the need for ferry transportation, which helps to keep the environment clean and reduces noise, water and air pollution. This makes the archipelago area more desirable as a recreational area and will bring more tourists to the area, which in turn helps the economy of the area and the local shops at the same time.

If this system is implemented into the regular life of people, it can open ways into a greener and more sustainable future.

5 FUTURE DEVELOPMENTS

In the future there could be lending of tools such as for gardening or renovating your home or cottage. If someone would like to have some tools, one could order them via application and then pay the pawn so the equipment gets back to the boat after use. Also medical equipment such as blood pressure measurer should be taken Into consideration.

If the launch of the first ferry is successful, there could be more ferries. Bigger ones for the bigger harbors and smaller ones for the smaller ones. In the bigger there could be more services available and the variety would correspondingly be larger. Smaller ferries could do without the library because they are only single story.

6 CONCLUSION

We feel the ferry is needed since it helps to keep the archipelago vivid and makes also the smaller islands desirable places to live in. One of the main goals is to help producers reach new markets and that would hopefully help small entrepreneurs to reach success in their business. The ferry features a modern design to go along with its sustainable agenda, which would represent the city of Turku as a smart sustainable city that is connected to the areas around it. We also hope to promote an environmentally friendly way of living by making green choices to also be the most convenient ones for everyday lives of the people.

It is important for us that the ferry would not add to the environmental issues we are facing now so that is why we have taken into consideration the upcoming challenges the ferry might face. The energy solutions in the ferry are modern and rely on renewable energy sources to better accommodate future challenges. The modular design makes it possible to tailor the interior to fit different purposes, which would help to prolong the lifecycle of the ferry.

We hope the ferry would create a vibrant community that would help to connect people to another and be an inspiration to people everywhere.

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