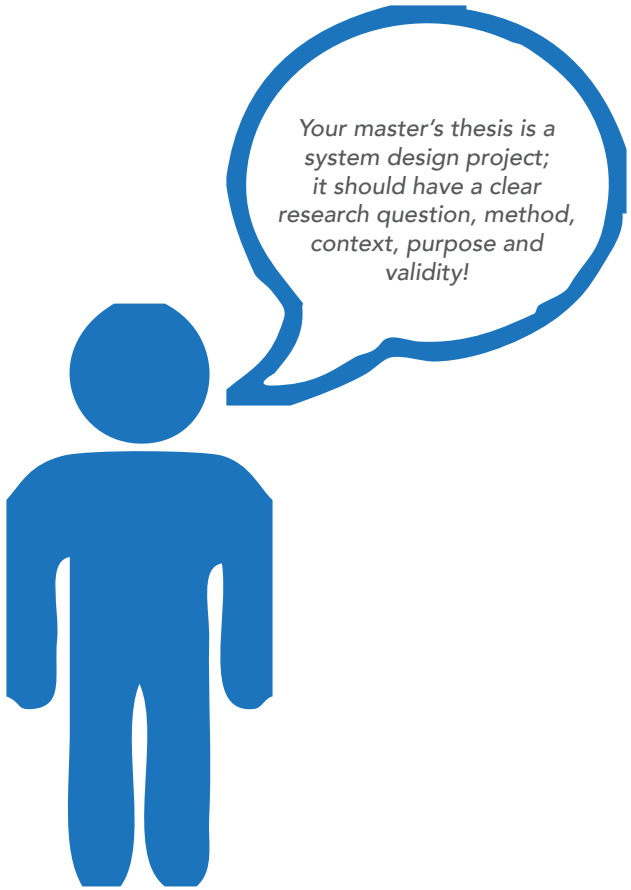
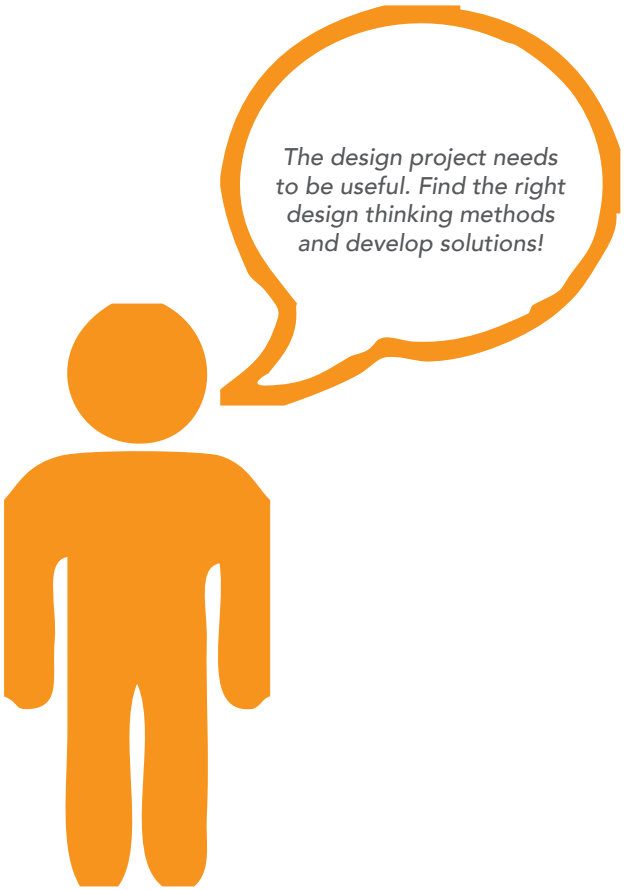


Prof. Faust



Prof. Stegmann

Figure: *Project Guidance*

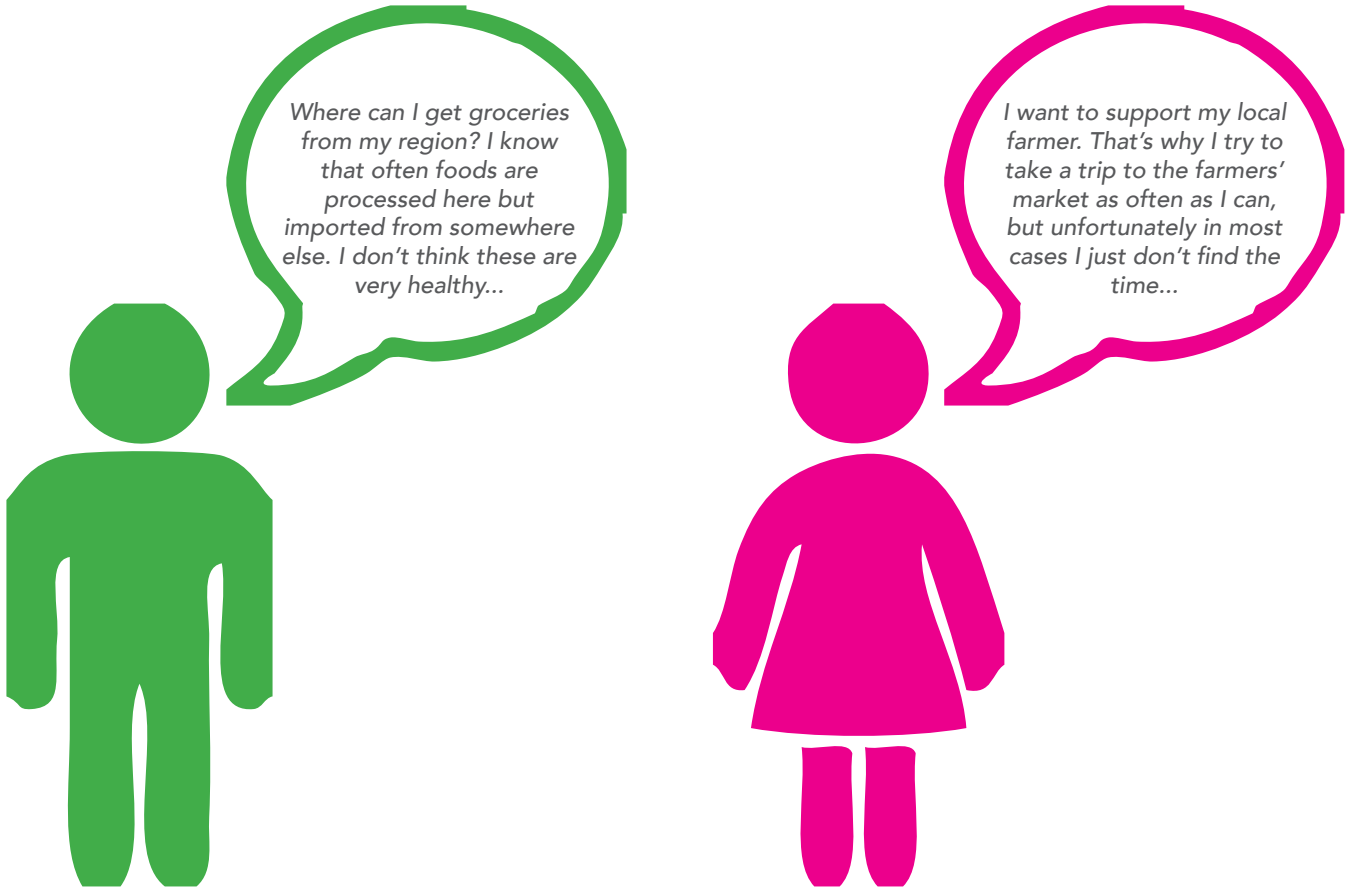
INTRODUCTION

This design project is the practical part of the master's thesis that is accompanied by a theoretical basis. The following pages will illustrate the findings from applied research methods and the development of a design proposal for origin traceability in Croatia.

Coming from a family that grows and processes fruit and vegetables has been extremely helpful in bringing this project to life and provided an opportunity for insight as a user group.

The structure of this project will be according to design thinking methods: empathise, define, ideate, prototype, and test. This is not a linear process; since there's more than just one user group, different design methods were applied and tested.

USER INTERVIEWS



16 Croatian consumers were interviewed in order to identify what their expectations, needs and wants from the food they buy are.

They were asked to tell a story of the last time that they were at the supermarket and prompted with the question 'why' to discover latent motives

Aside from responses highlighting some necessary attributes like 'fresh', 'organic', and 'quality', one third are frustrated because they cannot know for sure where their food is coming from.

Half of the respondents want to be more conscious of the food that they choose to purchase but don't have the time to invest.

These insights provided a basis for further investigation, and direction for the project as a whole.

Figure: *Consumer Interviews*

APP

Consumers want to be able to know where the fruit and vegetables that they buy come from and they want to be able to find this out quickly and easily.

With this app, users can scan a QR-code on product packaging and/or signage and track it to the field where it was grown and the physical journey it has taken through the supply chain to reach them.

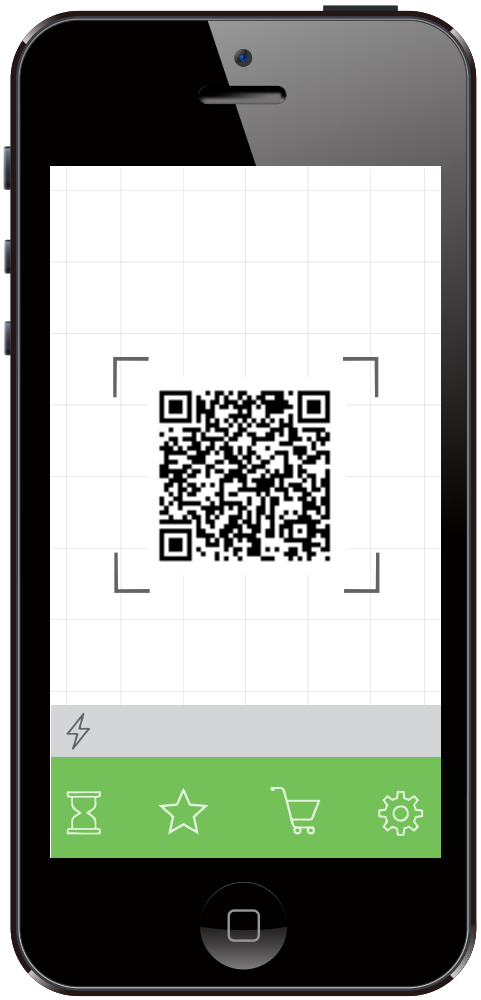


Figure: *Screen - Scanning*

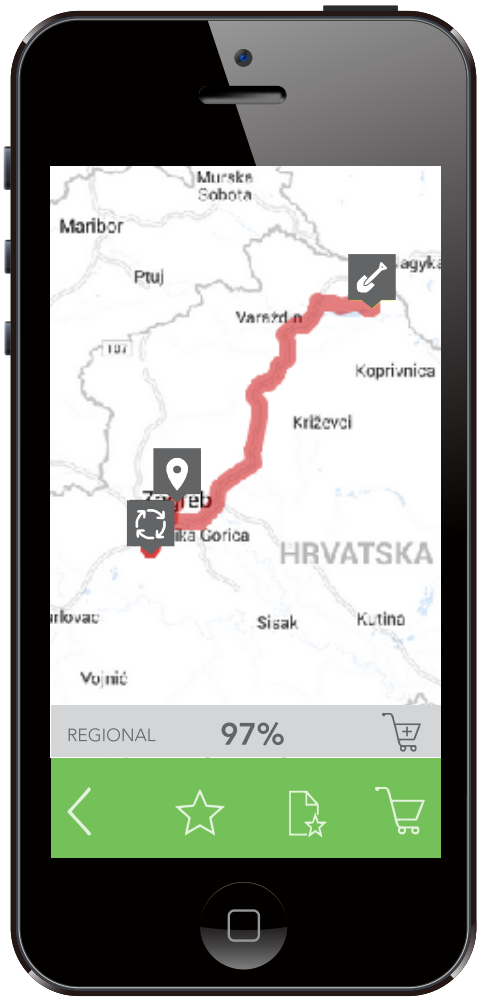


Figure: *Screen - Food Miles*

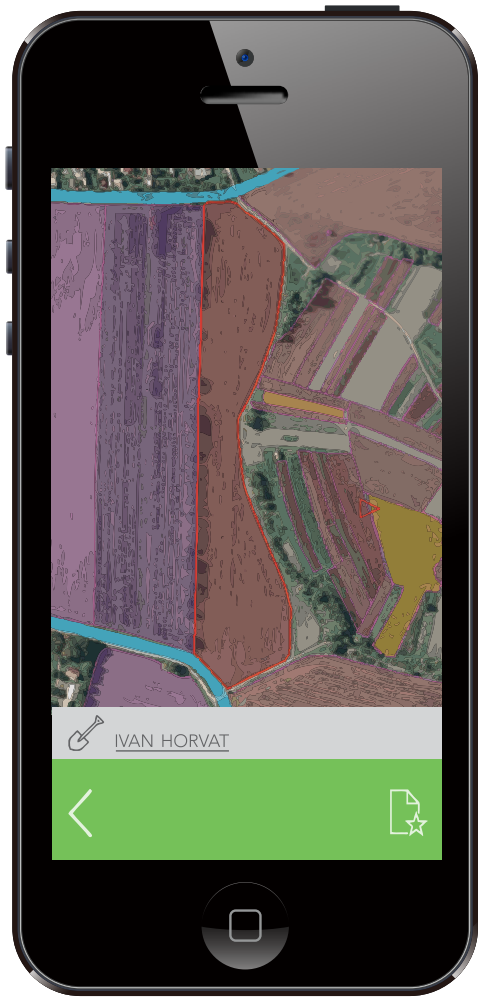


Figure: *Screen - Growing Parcel*

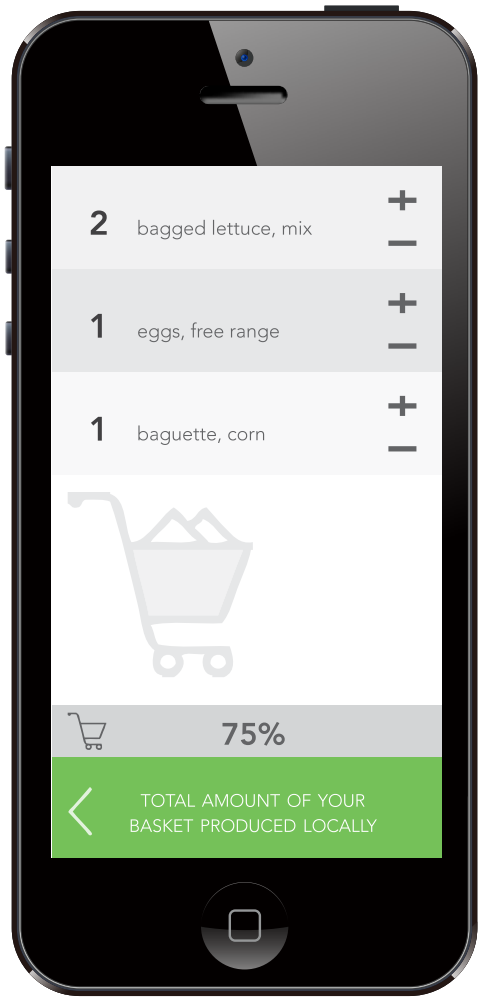


Figure: *Screen - Shopping Cart*

The map shows where the product was grown (which can be specified to the precise land parcel) and which processors it has gone through.This is displayed on a GPS map. Growers can, with the help of producers' unions, submit information about themselves and their practice.

Users are able to press the star button to save favourite products and keep a record of their purchase history.

A figure is displayed to show the proportion of the ingredients that are regional as a percentage. This would be relevant in the case of a prepackaged salad bag with greens from different growers.

Figure: *Expert Interviews (Processors)*

CASE STUDY

This case study was conducted on a processing facility in Croatia that deals with a number of growers and retailers through a visit and observations of the processing facility itself along with expert interviews with some of the managers there.

This provided insights into the process of fruit and vegetables along the supply chain but it also provided insights into the needs, wants and expectations of another user group of the proposed system – those processors within the industry, along with insights into other users, their business contacts, growers and retailers.

Photos and recordings were not allowed to be taken in the processing factory and so information was recorded using pen and pad, observing the environment around and asking questions.

Processors are frustrated with the large quantity of cheap imported foods on the market, which is making their business suffer. They are focused on ensuring a high quality of their foods, and have implemented systems and invested in expensive labels that the buyer (retail stores) usually insist on.

DEFINE

USER ANALYSIS

growers

processors

more value for their produce	WANTS	*opportunities to develop their brands*
technical, legal and financial support	NEEDS	*legal and financial support*
stable income	EXPECTATIONS	*more value for their produce*
growing friuit and vegetables	ROLES	*processing and packing fruit and vegetables*

Figure*: User Analysis (1)*

DEFINE

USER ANALYSIS

retail

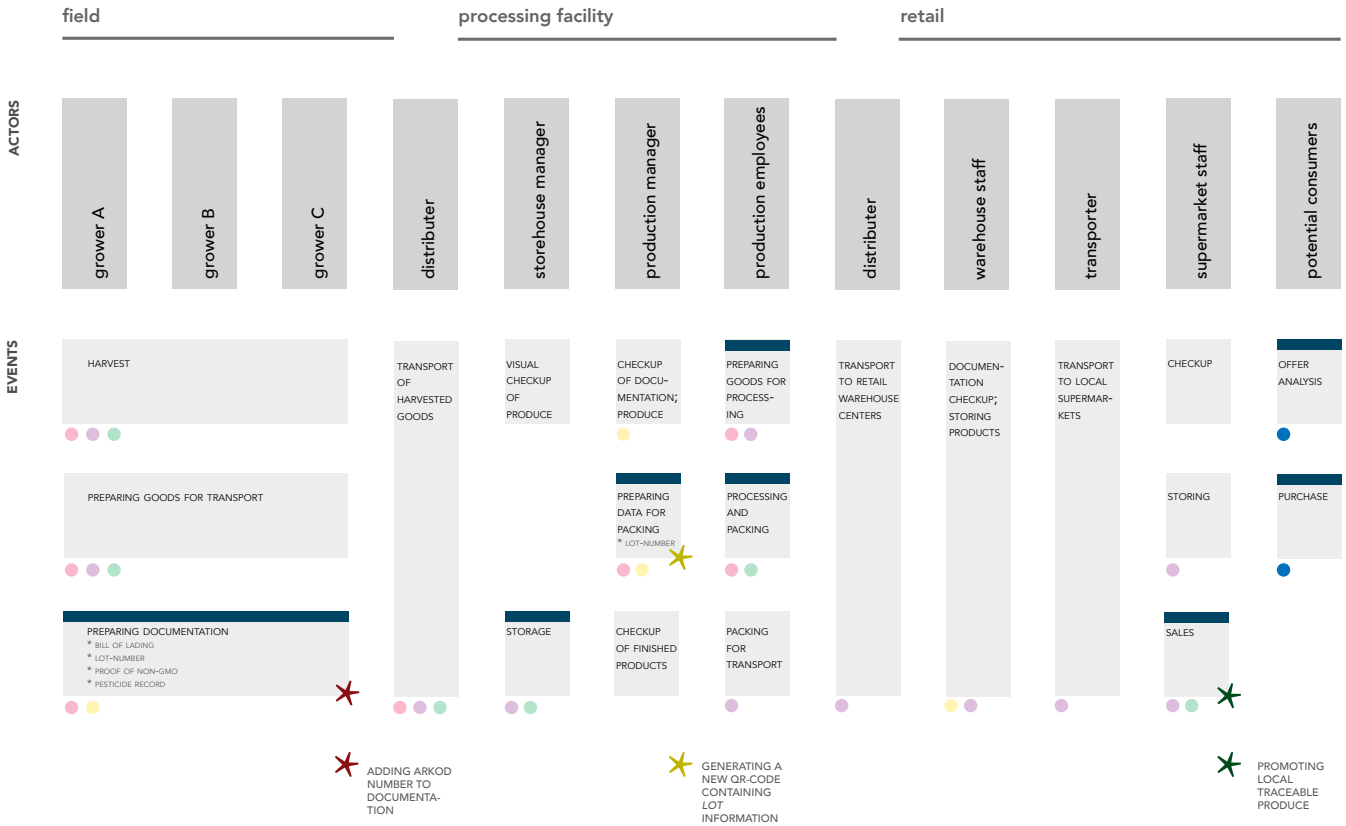
consumers

revenue growth	WANTS	*transparent produce*
legal and consumer support	NEEDS	*knowing their food*
good market position	EXPECTATIONS	*greater cost of transparent products*
providing consumers with produce	ROLES	*purchasing traceable products*

Figure: *User Analysis (2)*

PROTOTYPE

BLUEPRINT MAP



RISKS

- *mixture of produce*
- *improper documentation*
- *cold chain break*
- *contamination risk*
- *non-transparent information*

OPPORTUNITIES

- *where the current process can change*
- *what should change*

Figure: *Blueprint Map (CTEs: The Journey of Bagged Salad)*

STORYTELLING

1

Farmer gives transporter documents – instead of just a number he gives him crates with barcode stickers on them (including all lot and ARKOD information)

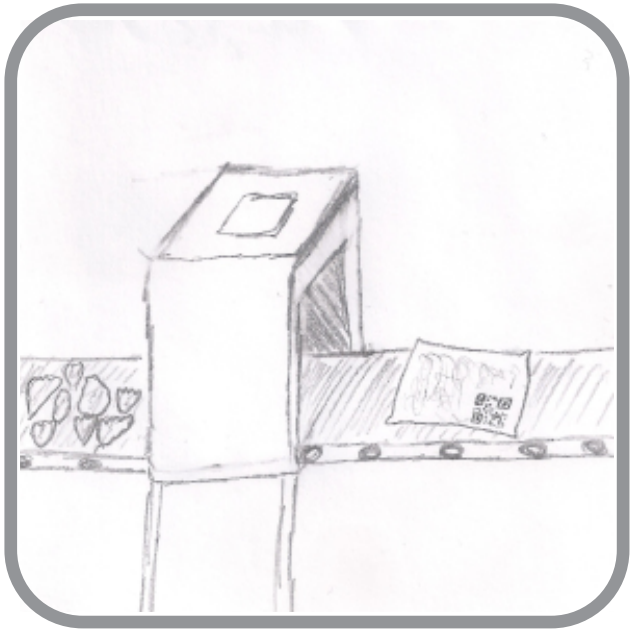
2

Transporter gives documents to the processor – crates are being put into the first cold storage. Lettuce will be processed by the principle FIFO- first in first out. Processor has certificates and standards in place, like HACCP. He makes sure he doesn't break the cold chain

3

The device scans the barcode on the crates, production manager is generating a QR-code containing information about the growers and the packing process

Figure*: Storytelling (1-3)*



4

The device prints a QR-code on the bagged salad which is now readable by the app

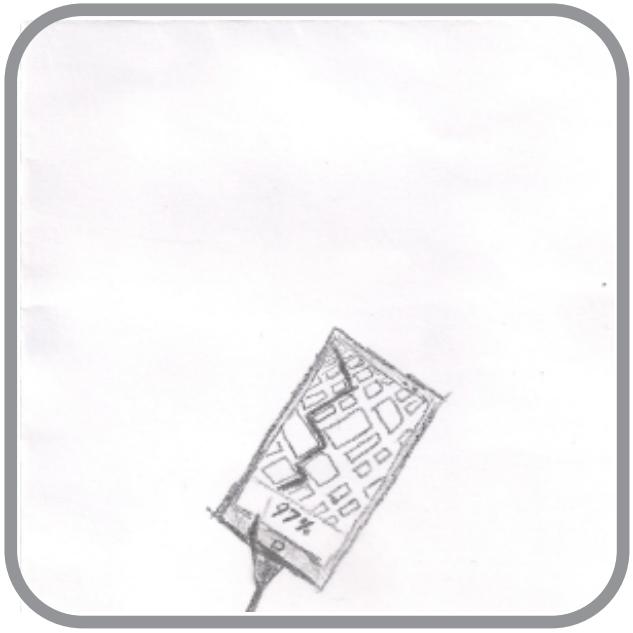
5

Transporter brings new products to the supermarket (cold storage), from there they're transported to local supermarkets

6

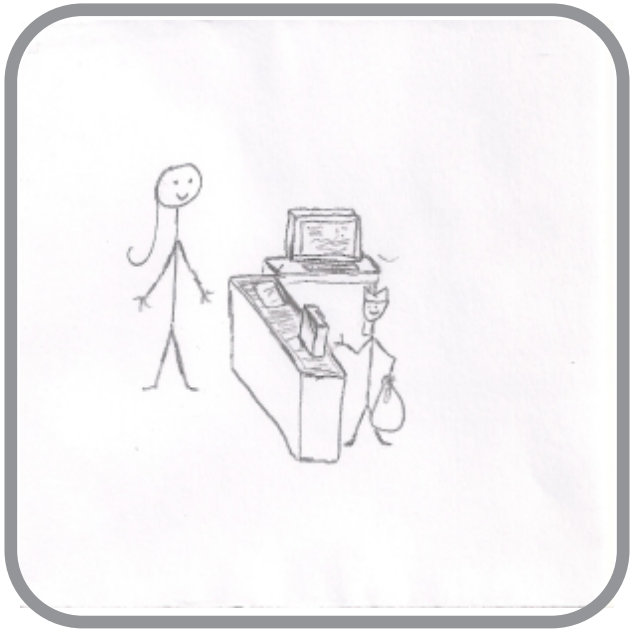
The supermarket can label these products and use the opportunity to promote the consumption of regional foods and therefore themselves as a community shop. Consumers can now scan the QR-code to discover the origin and journey of their food

Figure*: Storytelling (4-6)*



7

The app shows the percentage of ingredients that were produced locally and information about the producers and the processor including the exact origin and the production practices used



8

The customer takes her products to the check-out counter, feeling good about the products she has chosen to purchase. She is confident about the comprehensive information she was quickly and easily provided

9

This system encourages consumers to buy more regional foods and connect with their food more meaningfully

Figure*: Storytelling (7-9)*

TEST

STAKEHOLDER MAP

Figure: *Stakeholder Map*

The stakeholders map shows stakeholders pertinent to the system design and affords a wider perspective. Stakeholders are an integral part of this project.

Core stakeholders, those with immediate importance are displayed closer to the centre, and secondary stakeholders are displayed towards the outer edge of the circle in order of relevance. All of these stakeholders hold some relevance to the project but some will be more so than others.

Stakeholder maps are static images of a system that is always changing. It will be expected to change through time and with the development of the project.

The stakeholders map shown is the result of multiple iterations that began from almost the beginning of the project.

EU	European Union
DG AGRI	Directorate-General for Agriculture and Rural Development
EESC	European Economic and Social Committee
CAA	Croatian Agricultural Agency
CCA	Croatian Chamber of Agriculture
CCE	Croatian Chamber of Economy
CFA	Croatian Food Agency
MENP	Ministry of Environmental and Nature Protection

Expert interviews were incredibly helpful in leading this project. Observations and consultation with processors, along with some preliminary information drawn from the literature review, the blueprint map was articulated. This was a huge insight into the process that produce go through in the supply chain but also difficult to isolate useful and relevant information and displaying this in a logical manner. It was worth it, as the blueprint map served as a solid basis for future iterations.

Although a short stay in Croatia during the initial stages of the project was beneficial, an obstacle for the testing mode was the physical distance from Croatia during the majority of the project. Nevertheless this design process provided valuable insights on the issues in food traceability and transparency.

Most stakeholder feedback was positive, however there were concerns over the cost of such a system. The cost to install the system could be relatively high but the benefits would also be great. These costs could be difficult for small and medium sized firms, although some solutions naturally arise. For instance, producer collaborations or European Union funding.

QR-codes could easily be replaced by a different technology, this was used to show that a proposal such as this could work. It is certainly not limited to such technology.

Users would be willing to pay premium prices if they could be assured of particular product attributes such as ‘locally grown’ or ‘pesticide free’.

For future iterations of the system it would be useful to implement processes that would also monitor the cold-chain of fruits and vegetables.

It was discovered during the course of investigation that some form of traceability must be in place in order to adhere to regulation.

Because produce is highly perishable, it is often stored in small containers and identified very early in the supply chain. Many fragile fruit and vegetables must be immediately refrigerated after harvest and traceability is integral right from the beginning.

OUTLOOK

It was found during the project that fulfilling the wants, needs and expectations of end consumers was relatively easy. Balancing the other user groups proved to be more tricky.

This project, if implemented correctly, has the potential to benefit all key stakeholders. Consumers are assured of the origin of their food products and for this are willing to pay a premium price which then passes on to other key stakeholders in the chain. Consumers are more willing to buy from the same producers if they have a connection with them because of the transparency and if they can be sure of quality from personal experience.

The scope of this project in the future is not necessarily confined to just retailers. Food service industries could also benefit from a system such as this, allowing customers to trace the various ingredients in their meal and provide this transparency to service establishments.

This project has provided many valuable insights into the topic but more investigation will be required before it comes to fruition. Further iterations and testing will help to refine specifics.