BIOFOOD WEB APPLICATION REPORT

Customer?

Farmer?

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LUT – OPEN DATA CODE CAMP

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I.   Introduction: general information about agriculture in Finland

Finland is the northernmost country in the world which is capable of producing most of the food it needs. The conditions are severe, but the breeds, varieties and methods developed over centuries allow viable farming this far in the north. The structure of Finnish agriculture has changed in recent years. The number of farms has decreased by two to three per cent a year, in livestock production by as much as seven per cent. In 2010 the number of active farms was 62,800. Efforts have been made to improve efficiency and increase the farm size to respond to the challenges of the time. The majority of Finnish farms produce milk or cultivate cereals. Most of the farms derive additional income from forests. Of the cereal species, the cultivation of barley, oats, wheat and rye succeeds in our northern conditions. Several special crops are also cultivated. About a quarter of the cultivated area is under grass. Peas, carrots, onions, cabbages and certain other vegetables are grown outdoors, while tomatoes, cucumbers and potted lettuce and herbs are grown in greenhouses round the year. The average arable area of Finnish farms is 36.7 hectares and forest area is 48 hectares. Every fifth farm produces milk; most of these are located in eastern and northern Finland. The average number of cows is 30 and the average yield per cow is nearly 8,000 litres a year. More than half of the farms produce cereals, and most of these farms are in southern Finland. The majority of them grow barley, oats and wheat. The average arable area of cereal farms is 34.7 hectares. Finnish agriculture is still based on family farms. Almost all Finnish farms are owned by individual farmers or farming families. The average age of farmers is 50 years.

II.   The motivations behind the web application BioFood

BioFood is a web application that has been created during a special event at LUT: the Open Data and Green IT Code Camp. In this part, the reasons why we created this application are described.

As mentioned in the introduction, there are quite a lot of farms in Finland that are producing food and selling it. The main problem and the main motivation of our web application is the fact that there is at this time no website or application that references and gathers all these local farmers. As for a consequence, it appears to be very difficult and time consuming to search for local farmers through a web search engine… And most of the time, the available information are not even up to date, certainly due to the fact that people do not search for it because of the reasons previously explained…

With BioFood, farmers will be able to show their fresh products and finally people will be able to access the information they might look for. Indeed, nowadays and more than ever, people are willing to know what they are buying and eating, as well as where it comes from.

Besides, people like to save some extra money and buying local products can help them to save it. Shopping locally also supports the local economy, helps to reduce the transport costs and gives you the opportunity to buy a really fresh product. Moreover, this web application can even help to reduce CO_2 emissions because people will buy more local products: food transportation is one the major source of CO_2 emissions.

Thanks to BioFood, no matter where you are in Finland, you will find the nearest products and you will save a lot of time and some money, support local economy, eat fresh, tasty and ecological products and reduce your CO_2 footprint!

III. Details on the application flow

If you are a farmer, the first thing you need to do is to create an account on our web service. Then you can sign in and begin to add and modify your products information. By adding a new product in BioFood, the simple users and the other farmers will see it when they will browse the different products available.
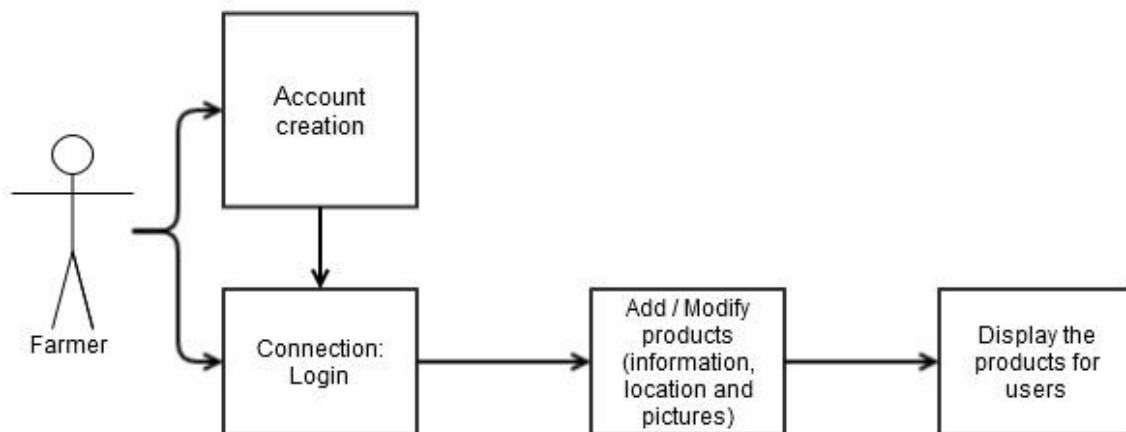
Picture 1: Farmer application flow.

If you are a simple user who does not have anything to add or modify on our website, you do not need to create an account. You can directly search for the local products you are interested in, find some information about them and most important you can find where are located these products. We wanted as well to implement a system to rate and leave a feedback to a farmer and/or a product, but we could not implement those due to time constraints.
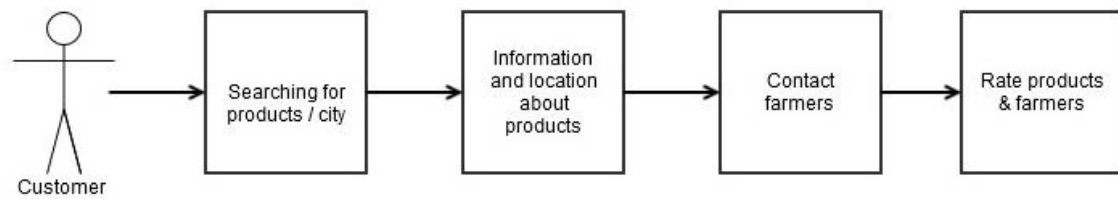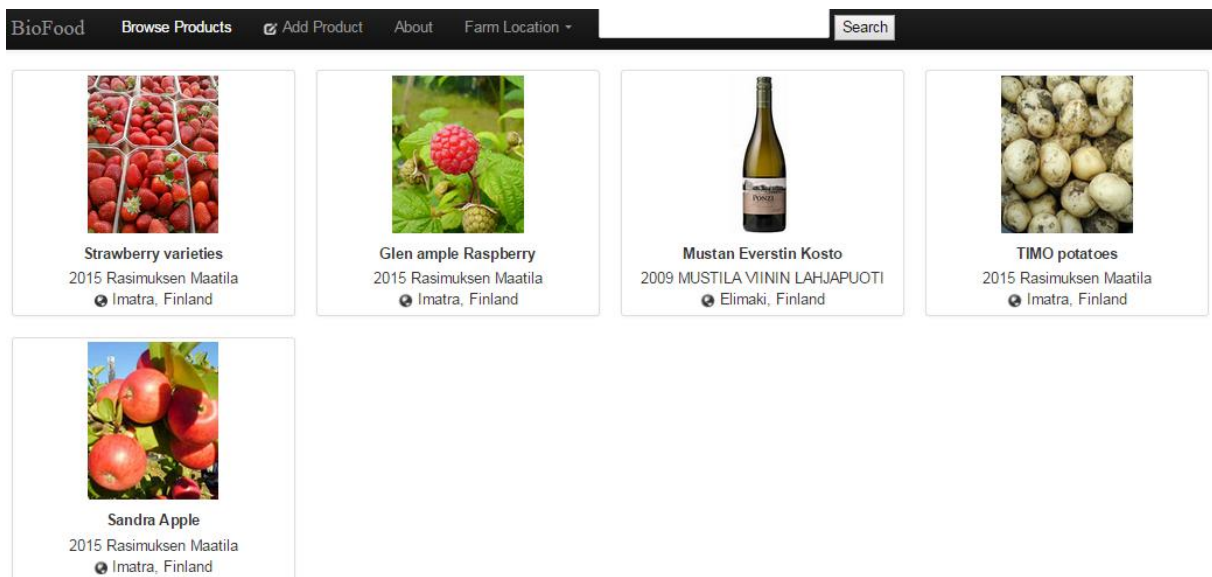
Picture 2: Customer application flow.
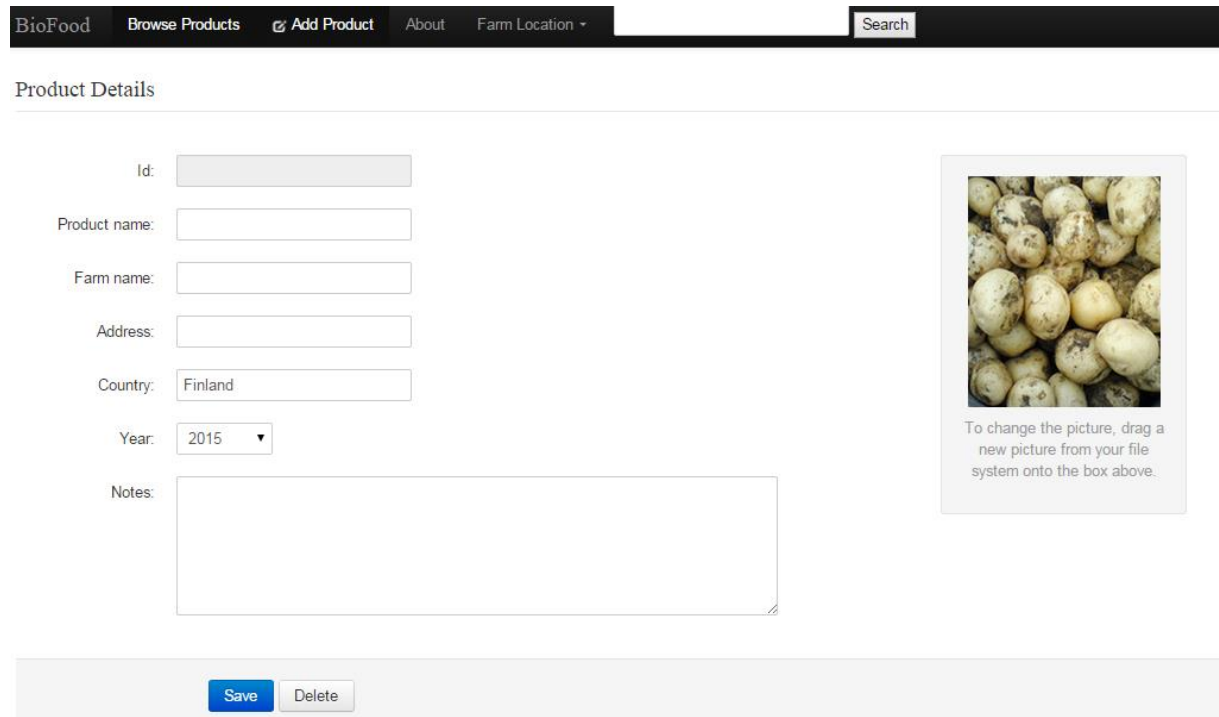
IV. Main features of BioFood

In this part, we are describing the main features of our web application BioFood:

- The search feature permits you to find the products you are looking for and to browse among the different products.

Picture 3: the search module of BioFood.

- The add products feature where the farmer can add his products (information, location, description…).

Picture 4: the add products module of BioFood.

- The localisation feature of BioFood helps you to find the location of the farm you are looking for. It opens another page where you can see the distance between your location and the farm one.
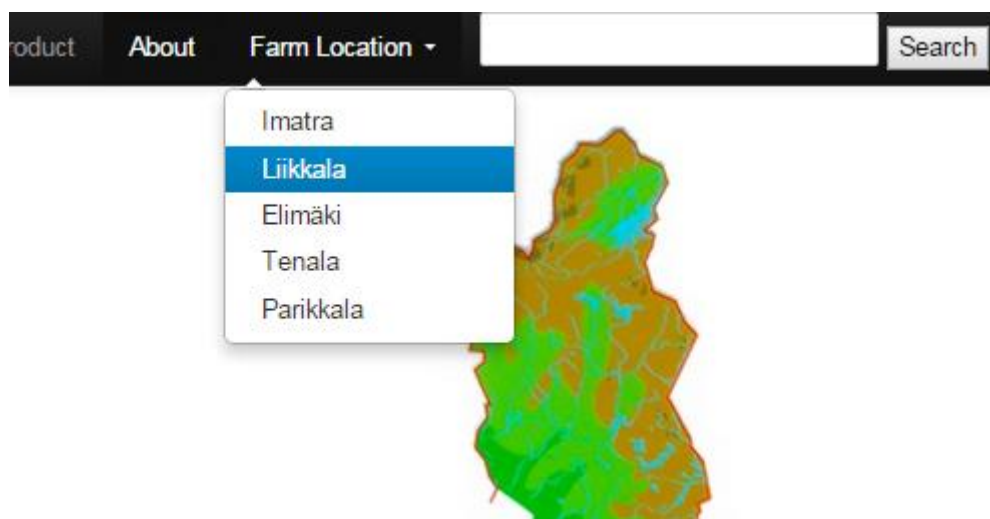
Picture 5: the localisation module of BioFood.
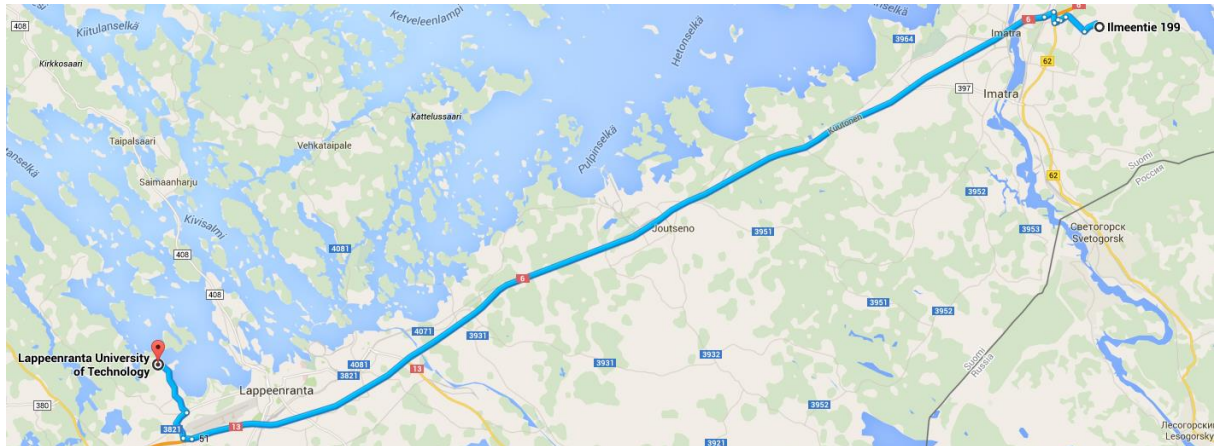
Picture 6: the distance from LUT to Ilmeentie 199, 55700 Imatra (farm: Rasimuksen Maatila).

V. Technologies used to create BioFood

In this part, we are describing the technologies that we used to setup and build BioFood.
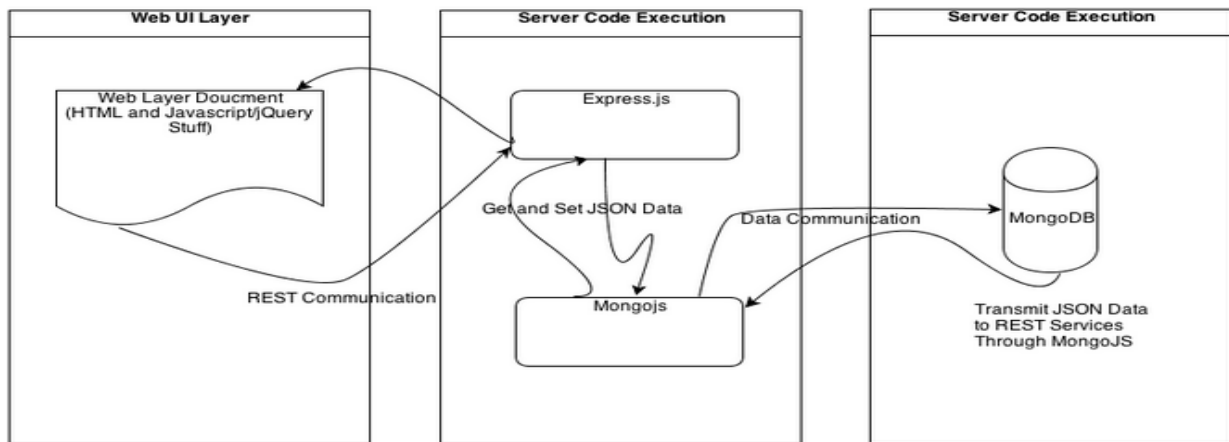
- Platform:

The platform that we have used in the code camp is Node.js which is built on Chrome's JavaScript runtime for easily building fast, scalable network applications. Node.js allows us to run JavaScript code in the backend, outside a browser. In order to execute the JavaScript you intend to run in the backend, it needs to be interpreted and, well executed. This is what Node.js does, by making use of Google's V8 VM, the same runtime environment for JavaScript that Google Chrome uses. In addition, Node.js ships with a lot of useful modules, so you don't have to write everything from scratch. Thus, Node.js is a runtime environment and a library. So we have used Node.js for our server side development.

With Node.js, we have used a framework called express js for web application. It allows us to develop RESTful web app that uses http standard.

For a database, we use MongoDB which is a cross-platform document-oriented database classified as NoSQL. MongoDB stores data as documents in a binary representation called BSON (Binary JSON). Documents that share a similar structure are typically organized as collections.

For writing and editing, we have used an online collaborative and development environment called cloud9.

The following diagram shows the overall architecture of the platform and frameworks that are used:

Picture 7: the overall architecture of the plateform and the framework.

- Languages:

The node.js application is written using JavaScript. In addition to JavaScript, HTML5 and CSS are used as a way of designing how the web app looks like.

- Technical comments:

If someone wants to develop a RESTful API, the Node will be of a good option. It allows a platform-independent (the only requirement is the ability to use HTTP connection), Language independent (client & server don't have to use the same implementation) and Standards based (HTTP!) implementation. It is recommended to use it in real time web applications like streaming, real-time services, web-chat applications, static file servers, etc. with high level concurrency without worry about CPU-cycles. It is not recommended to use Node.js in an application that requires complex processing with long running processes. It does not support multi-core processing rather runs single threaded.

VI. Future possible work to improve BioFood

Due to time constraints, there are some features that we have been thinking about but we could not implement them. Here are consequently some possible improvements that can be realised to make BioFood better.

- Correcting the feature drag and drop picture on adding product module, because this feature is not working now.
- Finishing the module to register and to sign in, then user and farmer will be distinguished on BioFood.