

:: Refereed Article A2:**Building food market communities with the open source LOKeT project**

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Mertik, M. (2014). Building food market communities with the open source LOKeT project. *Journal of Applied Computing and Information Technology*, 18(1). Retrieved June 2, 2015 from http://www.citrenz.ac.nz/jacit/JACIT1801/2014Mertik_LOKeTProject.html

Abstract

A pilot programme of local food market mobile services, LOKeT (Local e-market), was designed to support an alternative bottom-up approach for strengthening sustainable agricultural practices and local food production in Slovenia. This paper presents two building blocks: a) a mobile service for supporting local food production/consumption implemented in Dolenjska region developed on the open source platform LOKeT and b) an open source platform LOKeT designed for building new innovative mobile services based on Direct-to-Consumer Market model. The platform LOKeT is available free to open source community for further design of mobile services and for further innovation. It might be used by various companies developing mobile apps and open source communities in New Zealand and abroad.

Keywords

open source, mobile application, food system, direct to consumer market

1. Introduction

Europe today is faced with challenges in Food and Agriculture related to the EU 2020 Strategy. It was estimated that globally 80% of food is currently produced and marketed at local level, however in the European Union, this figure is only about 20%. *Opinion of the Committee of the Regions (2011)* on 'Local food systems' therefore considers that:

(a) local food systems support the local and regional economy and are of the utmost importance in less-favored regions where they stimulate the exploitation of local potential and help to improve the image of often neglected regions

(b) local food system's short distribution channels lead to greater interaction between consumers and producers where they create relationships based on trust and make products easily traceable by consumers and

(c) local food systems bring environmental benefits through more sustainable production systems.

Slovenia, as a member of the European Union (EU), is now implementing some of the

top-down approaches designed to address these issues. In the domain of local food systems Slovenia has established a plan for promotions of agricultural and food products in 2013-2018. This plan addresses some of the above mentioned strengths of locally produced food in the area. It is a classic top-down approach which uses massive marketing channels to address the citizens. These top-down approaches, however, are not sufficient instruments to be successful in today's information society. Gelb et al (2008) on the workshop sponsored by the Global Forum on Agricultural Research (GFAR) organized by Asian Federation of Information Technology in Agriculture (AFITA), World Congress of the International Association of Agricultural Information Specialists (IAALD) and World Congress on Computers in Agriculture (WCCA) outline sustainable agricultural development as a worldwide strategic concern where Information and Communication Technologies (ICT) have a potential to contribute to achieving significant economic, social and environmental benefits. With the era of web 2.0 and social and mobile web development these can be improved further especially on sustainable development moving from global environment to networking local development and local production.

A pilot programme of local food market place on mobile services was designed to support an alternative bottom-up approach for strengthening the local production of food. This paper represents an open source platform **LOKeT** developed under the programme and a new mobile service for easily connecting producers and consumers of local food through the use of mobile application.

2. Top Down Policies And European Agriculture Model Today

Local food systems have many positive effects on environment. Some of the key issues were mentioned earlier by The European Committee of the Regions (2011). Further, there are some additional recommendations of the European Committee that member states should consider:

- (a) define targets for developing local food systems in their Rural Development Strategy with support from the EU and national authorities;
- (b) adopt definitions of 'Local Food Products' and 'Local Food Systems', and introduce a new logo and identify a common symbol and scheme identity for local products;
- (c) make 'locally produced' as a standard selection criterion in tenders for the supply of food to, for instance, schools, nursing homes and public facilities.

Slovenia as a member state has adopted some of the recommendations mentioned above. The Ministry of Agriculture (2013) established a strategic plan for the promotion of agricultural and food products for the period of 2013-2018 with the program "Green table of regional flavors" focused on agricultural and food products. These products are part of the image of Slovenia showing clean, natural, healthy, diverse and sustainable country. The general name of the program "Green table of regional flavors" was defined due to some of European regulations which - controversial - restrict promoting of national/local food. Such promotion is allowed only in exceptional cases of special characteristics of products which should be supervised from the European quality system level. These and other facts should be mentioned, the European Committee of the Regions selected following observation and challenges for European agriculture model today:

- (a) there is no single European model in agriculture, the model is multifaceted and its diversity is a major asset;
- (b) links between farming and consumer's expectations are low and must be strengthened;
- (c) the local food system is a key issue that has so far not been sufficiently addressed in European agriculture model and *Common Agriculture Policy (CAP, 2013)*.

3. What is LOKeT

The new era of Web 2.0, social and mobile technologies has enabled so called read/write phenomena of the internet services. We are facing new digital literacy and

strong user participation in modern e-governance and policies (*Lessing, 2004*). Especially with evolution of mobile applications some of the challenges of local food system in European agriculture model can be additionally addressed. **LOKeT** (Local e-market) is an example of such open source mobile platform that addresses these issues and easily connects producers and consumers of local/regional food through new web and mobile service.

LOKeT is a first mobile service named and based on **LOKeT** open source platform. The service offers the following functionalities to consumers:

- a) an location based insight into local produced products (vegetables, fruits, dairy products, wine...) in an area;
- b) opening hours of local producers in the area;
- c) planning of the countryside route for pick up the products.

Consumers can easily and effectively combine trips to the countryside together with the purchase of area's locally grown food as the service provides insight into the current visited area and the producers opening hours. The consumer's role has no account in the application and is available free. Producers (touristic farms, family farms, processors) on the other hand need to create an account to easily generate and maintain their own local market (a list of their products with detailed description, prices, photos etc...).

The following functionalities are available to the users:

Functionalities for producers:

- (a) opening of an account,
- (b) easy entry of farmer's products,
- (c) easy entry of opening hours for the weekend period of time,
- (d) creating and editing producer's local market (list of products),
- (e) editing the properties of the product (price, availability...)

Functionalities for consumer:

- (a) access to the map of local farms in area,
- (b) access to the list of producers around the current position in local area,
- (c) access to the list of products around the current position in local area,
- (d) definition of basket items
- (e) planning optimal route for picking up the local products (in development)

LOKeT platform was developed for various mobile platforms but was prepared for open-source in Appcelerator Titanium (2013) environment for Android platform due to its wide use (front end). **LOKeT** is designed as a classical client server based application running on Linux back-end with Typo 3 CMS platform (*Typo 3 (2013)*). Schema 1 presents a key concepts and use cases of **LOKeT** platform for producer, consumer and **LOKeT** maintainer functionalities.

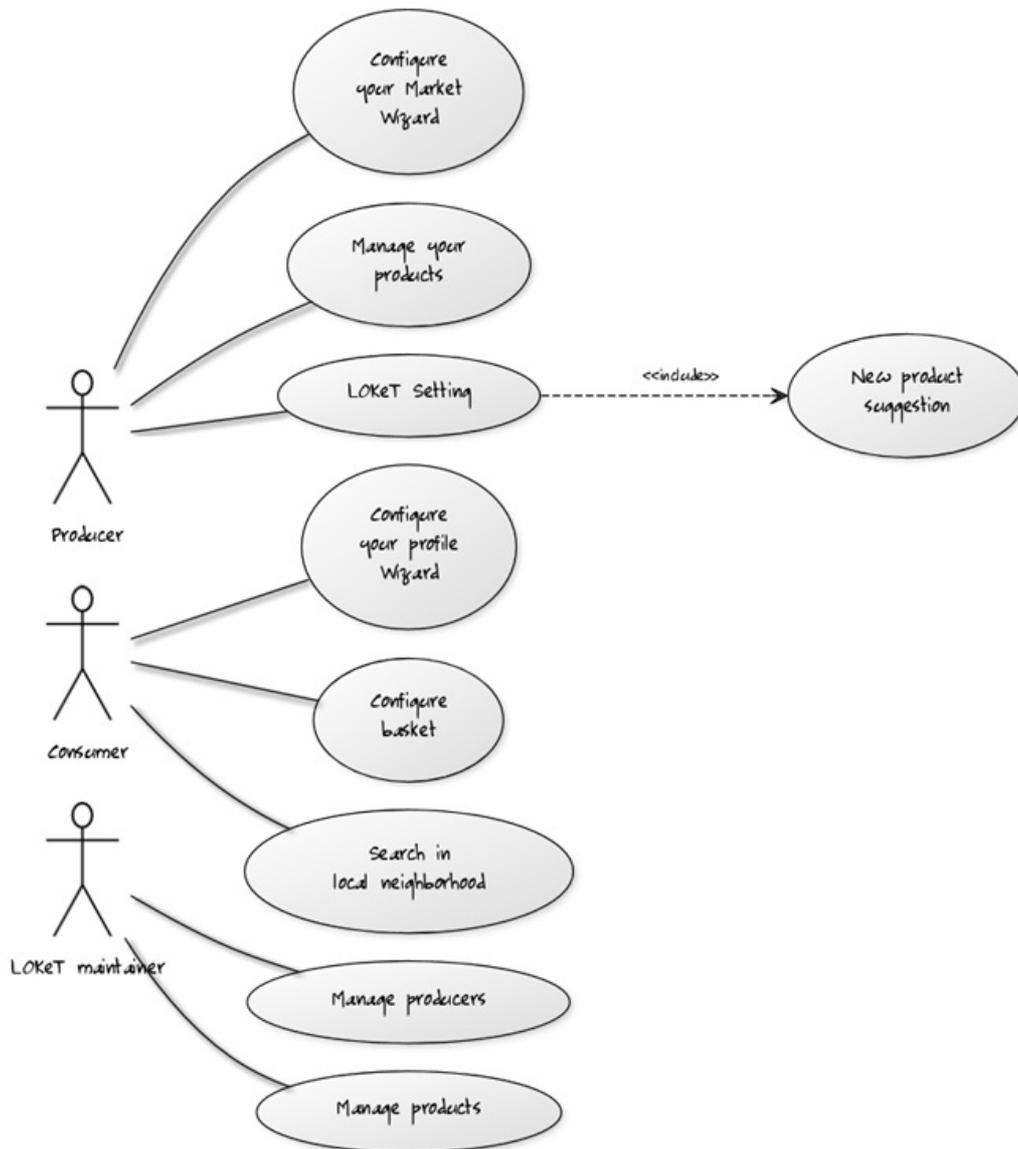


Figure 1. Schema 1: LOKeT concept - use cases

4. LOKeT as an Open Source Platform for Direct-to-Consumer Market Model

The bottom up approach of **LOKeT** mobile platform easily addresses the so called Direct-to-Consumer Market model which refers to promoting a product or a service straight from the producer to the consumer without intermediary facilities (there are different methods of direct marketing today as face to face, door to door, telemarketing, direct mail advertising). A Direct-to-Consumer Market model significantly diverges from a Direct-to-Retail model, where for example, we know various approaches like Farmers' Markets, Community Supported Agriculture and different Direct to Consumer Programs. These Direct-to-Retail approaches however usually require an intermediate entity that connects consumers with producers and, yet new technologies like social networks and mobile applications have emerged and enable self-organization of communities with minimal requirement of middle entities. *Gupta et al. (2009)* discuss and present mobile social computing applications (MSCAs) that promise to improve social connectivity in physical communities by leveraging information about people, social relationships, and places. Narrowing this kind of information with a focus on sustainable development leads to the idea of supporting local food production with **LOKeT** platform, a MSCA focused on Direct-to-Consumer Market model. The following schema presents building blocks and architecture of open source platform **LOKeT** on which mobile apps for Direct-to-Consumer Market model can be further developed.

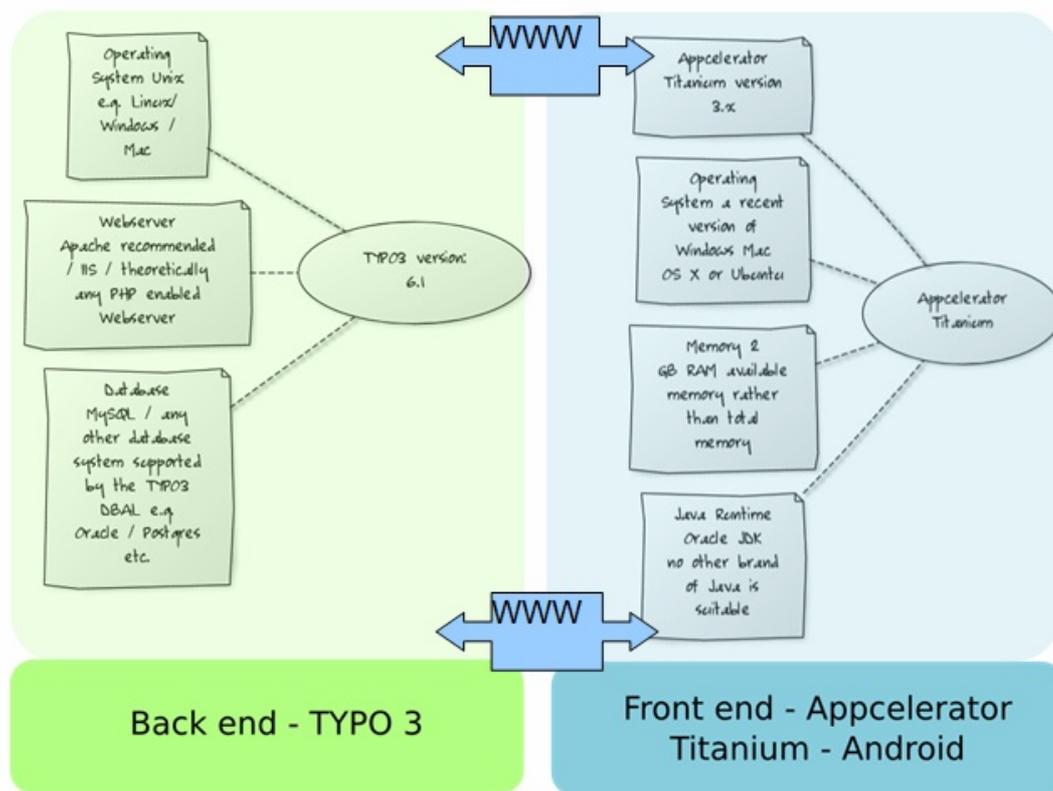


Figure 2. Schema 2: LOKeT platform server-client web architecture

5. Pilot Example of Food Market Community in Dolenjska and Bela Krajina Region in Slovenia

Addressing Direct-to-Consumer Market with the platform **LOKeT** and developed mobile service creates possibilities for a new way of thinking and possibilities for development of new business models (networking of producers, education and support, collaboration, knowledge sharing, developing common products). In this sense the introduction of **LOKeT** mobile application in the region of Dolenjska and Bela Krajina in south part of Slovenia has following goals:

- (a) building a network of farmers for **LOKeT** mobile application introduction;
- (b) educating the network about new technologies and possibilities for direct consumer access;
- (c) developing a pilot model for local food based on estimation of the model in real environment.

With the cooperation of the School for Agriculture GRM in Novo Mesto and the Faculty of Information Studies in Novo Mesto, a network of 20 farmers with local food products was established and introduced to the **LOKeT** mobile application. For this purpose two workshops with farmers were conducted where following complete mobile solution was provided to them including;

- (a) A tablet computer;
- (b) a mobile package with one year internet broadband access limited on 1GB per month;
- (c) tutorials for simple use of the app.

New farmers are currently introduced to the pilot model with an aim of building a strong regional network of local producers. It is predicted that the network will be introduced to the consumer in autumn 2014.

6. LOKeT First Observation and Further Open Source Innovation with

Extended Functionalities

It is important to understand that observing phases of the model development at every stage has important value for searching business model opportunities. For that purpose some of the early hypothesis testing was provided under the pilot programme of local food market. Schema 3 presents predicted development phases of the pilot programme with **LOKeT** application. Important aspects are defined in each phase.

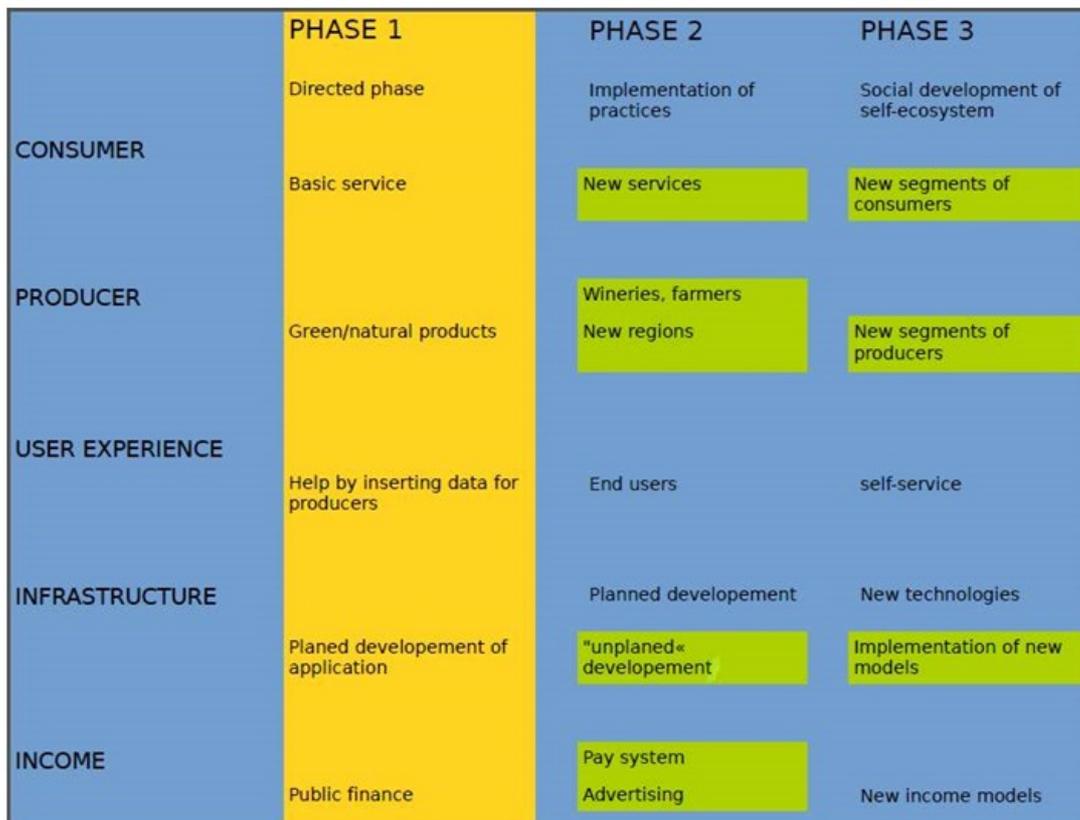


Figure 3. Schema 3: further stages of platform development (yellow color - accomplished task, green color - important task in phase 2 and phase 3 by developing and upgrading the model in pilot region)

When thinking about further steps in development of the local food market mobile service the following question arises, *Has the **LOKeT** business model service at this stage enough added value for producers to adopt it for serious use?* We can expect that there are enough end users for such a service between people/consumers that are aware of the quality of local food and are searching the origin of products. However this is not enough, it is of vital importance for successfully introducing the service is to continue with the enlargement of network of farmers as we might expect better branding and bigger variety of offers when 50 or more appropriate farms are included into the model. Only in this way will the **LOKeT** service be able to offer to consumers a large variety of products and efficient planning of a trip to the countryside. This is typically so known "chicken & egg" problem in the pilot phase. We are faced with the question "what is better to have first?", a large network of interested farmers or a *bullet proof* mobile application? Both are necessary, however the quality of the farmer network is crucial for application use in future. Therefore slow steps and observation in introduction of **LOKeT** service play a very important role. It is crucial to introduce the application to the farmers with extra attention, additional education, workshops and support in a longer time frame. Continuation of technology education and effort by supporting a help-desk for producers in the beginning phase are vital. Besides that the following key factors carry extreme importance when introducing the **LOKeT** platform: **infrastructure, usability, value of the concept and user experience**. All mentioned factors were addressed carefully during this first pilot phase and we can see that they should be observed constantly for growing the community of producers and consequently community of

consumers (Schema 3 presents further stages of platform development).

New functionalities and services can be implemented in the future. It is this reason that **LOKeT** is an open source platform (*Agenda (2013)*), what that means is everybody can download it and adopt it to their own needs. In this sense we can expect new possible extensions with a new functionalities or in new domain. At the Faculty of Information Studies there are currently few opportunities for bachelor degree students to improve the model or application with new extension. In this sense **LOKeT** as an open source platform for Direct to Consumer marketing presents an opportunity that might be further innovated not only in Slovenia but possible internationally. Some of the functionalities that might be addressed in the future include intelligent filtering of producers by consumers portfolio (list of wishes), searching optimal paths, integrating new segments of producers, integrating services within tourism, kiwi experiences in New Zealand, gastronomy, wine routes and tasting, for example. It would be interesting to observe the development of the open source platform in future where more developers, more interest and more the probability that platform will evolve in new versions in the future.

Acknowledgements

LOKeT project was co-financed under European Regional Development Fund and Slovenian Ministry of Education, Science and Sport.

LOKeT open source platform is available for further development by Agenda d.o.o (2013) at <https://github.com/AgendaDOO/LOKeT>

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Journal of Applied Computing and Information Technology (JACIT): ISSN 2230-4398

(Incorporating the Bulletin of Applied Computing and Information Technology, NACCQ: ISSN 1176-4120 and

Journal of Applied Computing and Information Technology, NACCQ: ISSN 1174-0175)

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