Specificities of the new complex software based services implementation at mobile operators.

B. Puškarević, N. Katica
Ericsson d.o.o
F.A.Zvizdovića 1/10, 71000 Sarajevo, Bosnia and Herzegovina
Telephone: +387 33 252 270, Fax: + 387 33 209 419
E-mail: bojan.puskarevic@ericsson.com, naida.katica@ericsson.com

Abstract - Due to the evolving of the mobile operator networks towards new convergent networks, importance of the introduction of new complex services is growing. The present market is more than ever oriented to the differentiation of operators by amount and quality of presented new services, and not by traditional telecommunication services. New services need to be implemented fast and costless. That is the reason why the services based on software solutions are the most common.
The implementation of new complex software based services is different than the traditional telecommunication services. It merges two different worlds – telecommunications and information technologies. It requires specific approach in various phases of the process. This paper will try to explain the specificities of that process and put emphasis on critical points.

Abstrakt – Kako mreže mobilnih operatora evoluiraju ka konvergentnim mrežama, tako uvođenje novih usluga postaje sve važnije. Trenutno tržište je danas, više nego ikad, orijentisano na diferencijaciju operatora po broju i kvaliteti pruženih usluga, a ne, kao što je do sada bio slučaj, po tradicionalnim uslugama. Uvođenje novih usluga treba biti brzo i sa minimalnim troškovima. Iz tih razloga su usluge, bazirane na softverskim rjesenjima sve češća pojava.
Implementacija novih kompleksnih softverski baziranih usluga se razlikuje od uvođenja tradicionalnih telekomunikacijskih usluga. Tu se spajaju dva odvojena svijeta – telekomunikacije i informacijske tehnologije, To zahtjeva specifičan pristup u različitim fazama projekta. Ovaj rad će pokušati približiti specifičnosti ovog procesa, te istaći njegove kritične momente.

Key words:
Complex software based services, convergent networks, traditional telecommunication services, mobile operators, project management, system integration, support, scope definition, integration points, acceptance testing, software development, location based services

I INTRODUCTION

In order to improve their competitiveness, in the time of convergent networks, operators turn to new and innovative services. In that case, service deployment and efficient service life-cycle management becomes very important to operators in order to gain competitive advantage.

For the mobile operators, a great challenge is to make a good estimation what services will be suitable for their subscribers. The social and cultural environment plays a great roll in success of introduced service on the market.

Short time-to-market of the new service becomes the most significant factor that will ensure great advantage to the operators comparing to their competitors.

Initial investment and OPEX are drastically reduced by reusing of service components that are already present in the network. Reuse makes also a deployment of the new services much faster.

Those are the reasons why most mobile operators choose to implement software oriented services. Software based services are easy adaptable, reusable, complex and can be developed in short period of time.

Further, introducing and implementing of a new service is some different then the traditional telecommunication services. Per definition service is "Any act or performance that one party can offer to another that is essentially intangible and does not result an ownership of anything. Its production may or may not be tied to a physical product". Traditional telecommunication services are connected to the mature products and contain predefined and reliable functionalities. On the other hand, new services are easy adaptable, user interface is very important and sensitive part and functions become more complex *(Figure 1)*.

The introduction of new services requires a different approach in all aspects and by vendors and by mobile operators.

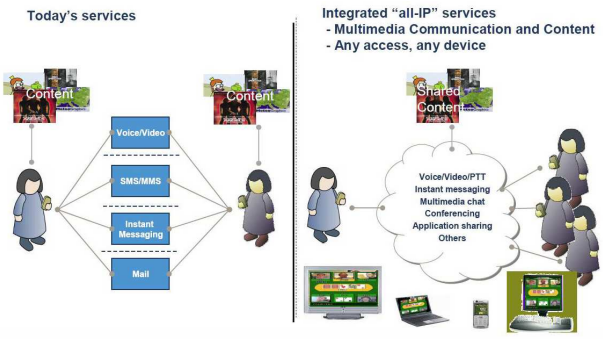

Figure 1 - Services

II PROJECT MANAGEMENT

Project Managers (PM) face a great challenge when introducing new services. In order for a project to be successful it is very important to:

- Adapt service specification to meet project objectives
- Fulfill requirements to meet stakeholder's needs, wants and expectations
- Make a balance in the following demands of scope: time, cost, quality, resources and risks.

In the projects, were new more complex software based services are introduced, there are some specificities opposite to the traditional services. During each phase of project management, due to the higher complexity of the new services, there are more possibilities for conflicts and problems than it was a case by introduction of traditional services. For example, by introducing of Location Based Services, it is very hard to make a detailed description of all possible functionalities and features in advanced. One LBS application can have a several different purposes and can be developed for fun, tracking, security, business or combination of all. In most cases, operators have no clear picture in the begin phase, which services will they introduce to their subscribers. A lot of questions are answered during the project or even later in test phase.

The critical points are explained further in the text.

A. Detailed scope

The new services, as stated before, are very complex and contain a lot of different functionalities. It is almost impossible in tender phase to define all functional details. Project scope definition should be as detailed as possible. Multiple pre-study meetings should be planned in the Time Management process. Telecomm operator needs to get a clear picture how the service needs to be developed (customer target group, billing model, subscribers provisioning method, user interface, features…). It is also very important that all stakeholders are well prepared for the meetings and that PM is able to make a good and exhaustive questionnaire. All open issues should be handled during this phase and Scope definition should be agreed and signed by both sides.

B. Change management

During the new service introduction project, it is not possible to have all smallest details defined in tender phase or even in Scope definition phase. The change management process should be planned by PM in advance very carefully to minimize risks of conflict.

C. Organizational differences

A difference in organizational structure is also a potential risk if vendors and mobile operator does not have similar organizations.
This is especially important by introduction of new complex services because during the project implementation, a lot of details need to be agreed (more then by introduction of traditional services). A lot of stakeholders from both sides are involved in the project execution. That can easily bring to opinion differences and communication problems and makes Realistic Estimation of time very difficult for the PM.
For example, if the mobile operator organization is a Functional Organization ***(Figure 2)*** and vendors is Strong Matrix Organization ***(Figure 3)***, there is a big chance that misunderstanding will appear in responsibilities sharing and agreement.

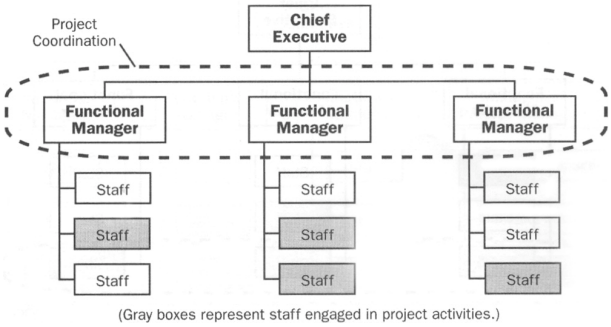

Figure 2 – Functional Organization

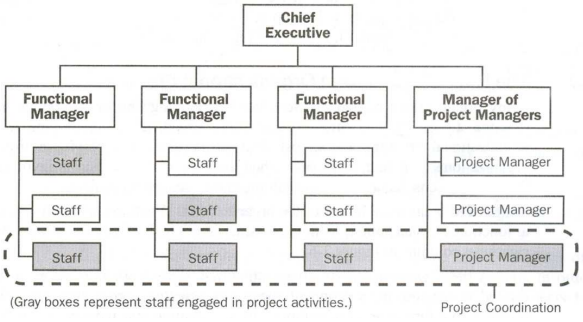

Figure 3 – Strong Matrix Organization

D. Customer understanding

The PM from vendor side should be aware of customs and legislation of the mobile operators. Because of commonly growing complexity of the operator's networks, it is extremely important to know and understand their ways of working, needs and expectations. It is strongly recommend that if one team participates in a project of implementation of some complex software service at one telecomm operator, the knowledge about infrastructure, employees, and requirements should be reused on other projects. Issues as provisioning, ticketing, billing, security are mostly similar by all services which that telecomm operator will introduce to its subscribers.

E. In depth technical knowledge of PM

Due to the complexity and constant requirement adaptation, new services projects require a constant presence of a PM close to the project teams. Decision making process flows easier if PM has a in depth technical knowledge about the operator's technical environment and offered service itself.

III SYSTEM INTEGRATION

Introduction of new complex software based services requires some different approach in System Integration (SI). It often involves software development, customization during the integration process, difficulties with testing and verification, complex integration environment as explained further in the text below.

A. Customization

System Integration of a new service often involves constant changing and adaptation of initial requirements. At this point in the project, mobile operators get more familiar with the system so the most of the new requirements changes are made in this phase. Most of the requirements are legitimate and it is very hard to estimate whether they are in or out the project scope.
For one LBS application, as an example, where subscribers can locate each other, it is very hard task for the operator to develop the service which will be most suitable for their subscribers. The charging model can be complex due to lot of possible scenarios and it is not always possible for operators to define everything in pre tender phase. Also, issues as privacy, provisioning of subscribers, security requires a lot of attention and need to be carefully defined.
Because of that, it would be advised to plan this extra effort in the tendering phase and to define a scope as detailed as possible.
Since there are a lot of requirements changes during the process of integration, it is of great importance that technical responsible person is constantly available. Technical manager should be aware of everything that customer might want to modify and to be able to make decisions.

B. Software development constant involved

In difference to the traditional system integrations in telecommunication world, most changes and errors corrections are not related to the configuration changes. Usually it means that extra software development needs to be performed. The new software releases are constantly deployed without exhausted tests which makes system less robust.

C. Integration point

The complicity of the operator's network is much higher in convergent networks. One relatively small LBS application requires integration to various systems as provisioning, ticketing, billing, positioning, sms/mms….
New services use and reuse a lot of functionalities already present in the network. Integration points should be defined during the Scope definition phase. All stakeholders should agree with the way and the level of integration in details. Cooperation between experts is very significant so that integration can be successfully accomplished.

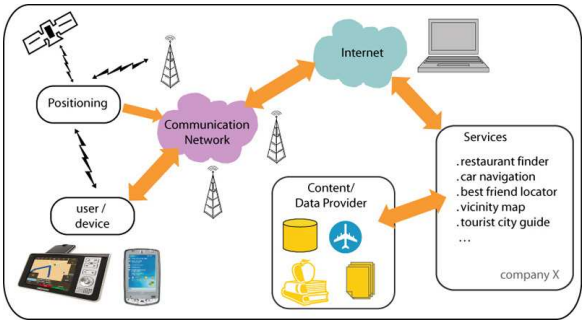

Figure 4 – Location Based Services

D. Acceptance testing

Because of the nature and high functional complexity of new software based services, it is very hard to verify which part of the system is acceptable for the customer. On the other hand, acceptance tests protocol can be too detailed and tests can take too much time and be constantly repeated. This part of the SI is very crucial and it is very important to have a good relationship with the customer.

IV SUPPORT

Introduction of the software based services also brings some changes in support for the mobile networks.
The same as in SI part, Support of systems includes more software changes for any problems, then configuration changes.
Due to the great complexity of the new services and not enough detailed description of the system (technical solution and project scope definition), a lot of change requests are solved as trouble reports within support organization.

The new software based services are recently introduces and quite new in the mobile operators market. It is necessary for the support organizations to adapt to the new ways of working.

V CONCLUSION

The introduction of the new complex software oriented services at mobile operators brings a lot of changes to the ways of working for all stakeholders. Services are more complex and difficult to describe and differences regarding the traditional services must not be underestimated.

Because of software development, the telecommunication world and mobile operators are coming closer to the IT world and vice versa. It is not possible that mobile operators remain the same. They need to adapt in order to meet more demanding needs and expectations of their subscribers.

High complexity and nature of software based services will bring a lot of changes in all parts of service introduction, from tendering to the support. Vendors, providing products and services to those mobile operators, will need to follow this trend in order to stay in the business.

It will take some time for all stakeholders in this new world to get used and adapt to the new concepts of introduction of new software based services. Anyhow, this trend is the future coming very rapidly and conquering all of the parts of mobile industry.

REFERENCES

[1] Philip Kotler, Marketing Mangement, 10nd Edition, Prentice Hall, New Jersey, 2000.

[2] A Guide to the Project Managemet Body of Knowledge, 3th Edition, Project management Institute, Newtown Square , 2004.

[3] Cahrles S. Wasson, System Analysis, Design, and Development, Jhon Wiley & Sons Inc, New Jersay, 2005.

[4] Prof. dr. ir. Joan E. van Aken, Strategievorming en organisatiestructurering, 2nd Edition, Kluwer, Deventer, 2004.