HUMAN LEARNING PROJECT

REQUIREMENTS ELICITATION PHASE

REQUEST FOR FEEDBACK

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EXECUTIVE SUMMARY

The Human Learning Project aims to develop a free and open sourced mobile learning platform (entitled: m4ed) that can be accessed and used with many different kinds of terminal devices ranging from feature phones to smartphones and tablets and desktop computers.

This document describes the actions that should be taken during the requirements elicitation phase of this project. We kindly ask the help of all interested parties to partake in this phase by sharing their experiences and ideas regarding the development of a useful mobile learning platform and services.

This document has been divided into three sections; An Introduction that describes the rationale for the actions in this phase, and action items that we kindly ask the intended readers of this document to perform. The third section covers the examples that

We ask you to provide us your input for the following subsections:

- Metadata and other standards in education
- Identify possible customer segments and relevant stakeholders
- What it is, What it isn't and Why it is done?
- Customer processes and customer value creation
- Detailed user stories

Please mail the responses to these action items to: Pekka Toiminen - pekka@hlp.fi

1. INTRODUCTION

A paper by Marjo Kauppinen et al. 2009 From Feature Development To Customer Value Creation[1] has been used extensively here as the basis for coming up with a different kind of approach for requirements elicitation. The key idea is not to focus on the "inside-out" approach where the value of a product is thought to be in the amount of features that the product has. The proposed "outside-in" approach (Kauppinen et al. 2009)[1] tries to shift the focus to the customers' processes and provide value when customers use the product in all parts of those processes.

REQUIREMENTS ELICITATION PHASE

The first phase of the requirements engineering phase is the requirements definition phase. The first step of this phase is that the requirements are elicited. We need to discover actively customer and user needs before they're prioritized and analyzed in the next step. So in the elicitation phase it's not that important to use precise methods / structured information as it is to try to gather all relevant information that could lead into actual requirements.[2]

CUSTOMER VALUE CREATION

Value is created in customers' processes when individual consumers or industrial users make *use of the solution* (Normann and Ramirez 1993). The focus should not be on the products and features but instead on the customer's processes where value emerges for customers and is perceived by them (Grönroos 2007). The customers processes are divided into separate stages as depicted below (adapted from Kauppinen et al. 2009). This is just an example but should give an idea of what we are after. All of these processes must be supported in a satisfactory way. The analysis phase later prioritizes these processes accordingly but the most critical phases must be supported.

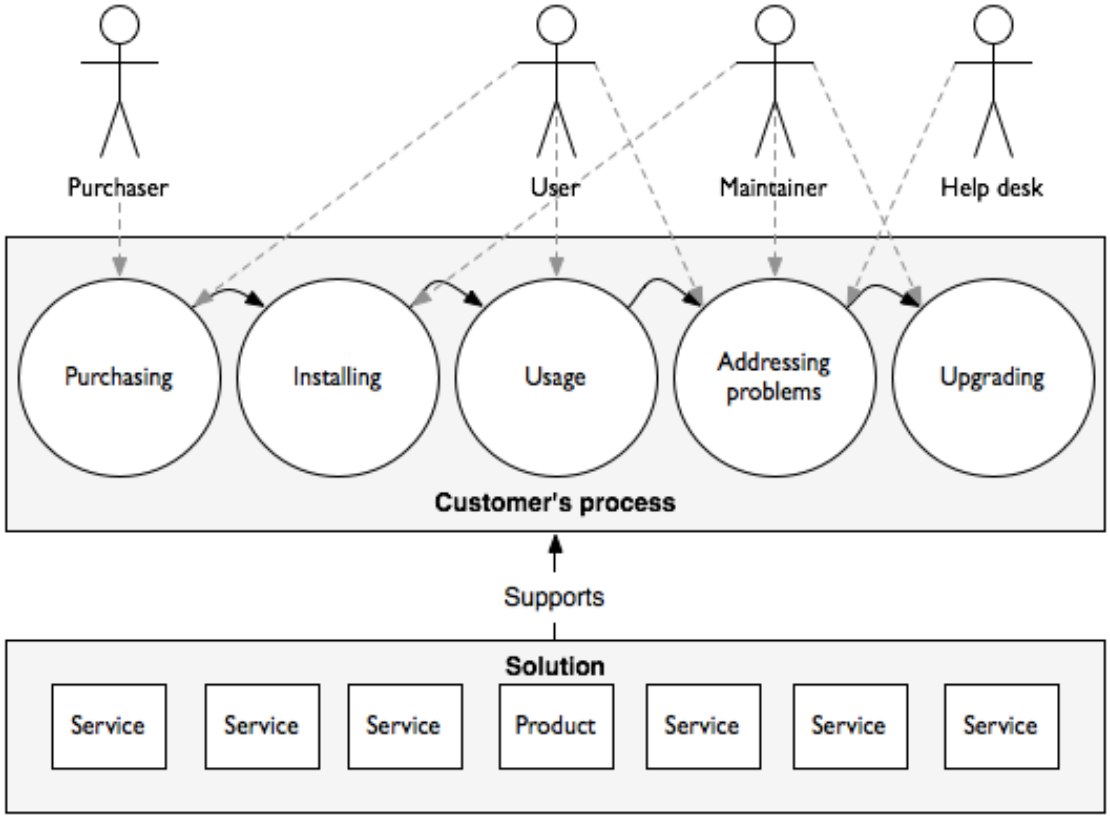

Figure 1. The “outside-in” approach for creating value through understanding customer processes (Kauppinen)

The customers and users should not be treated as one big group. The products must support their processes. This also requires a good understanding of the big picture in the requirements elicitation phase. The product features should not be seen as the core of value creation. Just stacking up features to product and trying to improve individual features (especially without justification from the customer’s processes) too much are seen as common pitfalls (Kauppinen 2012).

PRACTICES FOR SUPPORTING VALUE CREATION

1. Identify customer segments
2. Discover information about customer processes actively
3. Create direct contacts between development team and users (or their representatives)

2. ACTION ITEMS

Please email the responses to Mr. Pekka Toiminen - pekka@hlp.fi

2.1 Metadata and related standards in education

The content is going to contain lots of metadata among the content itself. This metadata can be used to categorize content, to help in assessing the competence of the users, and for example to follow certain procedures that could enable the content to valid under certain governmental circumstances. For this process we would like you to list the following:

Deliverables

1. List of standards that should be taken into account regarding educational services
2. List of standardized metadata sources relating educational services
3. List of other similar items that should be taken into account
4. Your own considerations for the content and nature of the metadata that should be bound with the content (e.g. difficulty level of exercises, content categories, user ranking, technology related like mimetypes, gamification parameters?)

2.2 Identify customer segments and relevant stakeholders

Here we would ask you to come up with your ideas of possible customer segments and relevant stakeholders for mobile learning systems in such contexts. We also need to gather short user stories in the form **"As a <stakeholder> I will use <functionality> because I need to <rationale>"**. The gathered data will be grouped to similar items, prioritized, and will be used in forming the vision statement document.

Deliverables

1. List of possible customer segments and relevant stakeholders per segment.
2. Very short user stories in the form "*As a <stakeholder> I will use <functionality> because I need to <rationale>*" (use stakeholders from previous action item)

2.3 What it is, what it isn't and why it is done?

This part is quite simple. We need to come up with plenty of short "bullet point" -kind items that describe mobile learning system as: **what it is, what it isn't and why it is done**. After all these items have been collected, they're put on display to help in crystallizing the vision statement.

Deliverables

1. List of sentences for each of the above mentioned categories. (this doesn't need to relate to the stakeholders directly, but is for the larger picture)

2.4 Customer processes and customer value creation

This part is not as straightforward as the previous ones. The introduction chapter of this document explains why it is important to understand customer processes, how value is created in those processes and what customer processes mean. We would like to learn about existing customer communities and the processes inside them, especially such things that can't be considered self-evident. Often these could relate to demographics, cultural aspects and overall conditions that surround the launch of a mobile learning service.

2.5 Detailed user stories

In case the customer processes and identifying where value could be created we would like you to come up with more detailed user stories that embed some customer processes and one could learn between the lines how the value could be created with the software. In this part you should imagine a system that would be optimal in the chosen context (your choice, your best knowledge) but still possible to implement in the real world.

Deliverables

1. Detailed user stories where you describe in your own words: Context and goal, stakeholders, user stories per stakeholder and whatever other information you may see appropriate.

3. EXAMPLES FOR ACTION ITEMS

This section contains some of our example responses for the action items to instruct you more on what we are after in this phase.

3.1 Customer segments and relevant stakeholders

Customer segment: Universities willing to do scientific research on mobile learning.

Stakeholders:

- organizing party (university)
- teachers
- students
- researchers
- content creators
- administrative personnel (for permissions to conduct the study)

Customer segment: A health care organization wants to provide a maternity guidance system.

Stakeholders:

- organizer (health care association)
- end-users: pregnant women
- end-users: husbands
- staff of the organization (statistics)
- content creators (health care professionals)

Short user stories:

- As a pregnant woman I will use guides for different pregnancy stages because I need to be aware of how to act if something unexpected happens and to learn what I shouldn't do while I'm pregnant.
- As a nurse I will use statistical data (weight, pregnancy months, etc.) collected through the service because I need to follow the progression of the pregnancy and react to problematic situations.
- As a husband I will use the service to educate myself so that I understand better my wife's needs during the pregnancy.
- As a content creating healthcare professional I will use the service's content creator tool to create helpful guides for pregnant women .
- As an organizer I will use user management interface to create user accounts for the users and deliver instructions on how to take the service into use.
- As an organizer I will use user export and printing functionality to print out user accounts as flyers and deliver them to pregnant women.

3.2 What it is, what it isn't and why it is done

This relates to the entire system that we should be building.

What it is

- A mobile learning platform
- A way to learn anywhere, anytime, using only a basic mobile device
- A system where new learning content can be introduced and distributed to a wider audience
- A system where learning can be tracked
- A system where learning can be divided into meaningful parts and directed to certain user groups
- Social environment for learners
- Mobile Internet based service
- Platform to provide formal, non-formal and informal learning

What it isn't

- A ready made learning system full of quality learning content
- A system for some certain teaching purpose
- A publishing system that can be used to publish all kinds of mobile content with any imaginable format
- A collection of mobile applications

Why it is done?

- No earlier large scale mobile learning systems exist
- A clear need for a mobile learning system, especially for feature phones
- All people don't have access to quality teaching material or can't afford a smartphone or a computer

3.3 Customer processes and customer value creation

In this example we have embedded information about the customer process and customer value creation into the following detailed user story.

3.4 Detailed user story

The background for this detailed user story comes from a mobile learning study conducted in Mexico City, Mexico in the year 2011. [3]

Context and goals

A university in Latin America decides to study mobile learning impact in math studies with 5th graders in country's public schools. They want to arrange a mobile learning environment for 200 kids in two schools and then study the effects with control and experimental groups. They have feature phone level devices arranged for the students and provide SIM-cards for them that have data

access. The kids have not necessarily used Internet or mobile devices before and their teachers are assumed to have little knowledge of technology. Alongside the learning goals the service's goal is also to introduce the mobile devices as part of the education process and take them into the classroom, and the access to the service and devices is not limited with school hours as the kids are able to take them home and use the service on their free time as well.

Stakeholders

- organizing party
- content creators
- teachers
- students
- researchers

User stories by stakeholder (Organizing party)

Agrees with the schools that the study will take place in the school environment and informs the school's council and national governing body that this kind of event is going to take place. The organizing party then sets up the learning space in the mobile learning platform and inserts manually the student information to the system. After the student registry is created to the system, the organizer prints out stickers from the system and delivers the devices and instructions on accessing the service. The organizing party also creates agreements that students' parents sign in order to receive the device. Throughout the use of the service the organizing party monitors that the service is in use and explores live statistics.

User stories by stakeholder (content creators)

Creates the content for the service by using the content creation tools provided by the service. These are several experts in pedagogy who participate in the content creation process as everybody has their own area of expertise. They all contribute to the same pool of knowledge. The content creators have also the possibility to modify the content they've created even after the service has been "launched".

User stories by stakeholder (teachers)

Receive training from the organizing party on how to use the service and what parts belong to the scientific study. The teachers are not necessarily experts in mobile technologies so they will also receive training regarding that. The teachers have received a schedule from the organizer under which they teach every topic. The teachers let the students to access and use the service during classes when they're studying mathematics, during recess and after school. The teacher is able to monitor how well the kids are doing with their studies through a teacher interface that has been bound to their user accounts.

User stories by stakeholder (students)

Receive devices that have access to the service. The students are instructed on how to take care of the device and how to use it. Then whenever they have a math class they're allowed to use the device. The devices are given to them so that they're able to use it also off-school hours. The students go into the service and navigate to the appropriate topics or to topics that interest them. The service provides them theory and exercises relating to their current curriculum. The exercises consist of multiple-choice questions and the theory portions contain text, images and animations.

User stories by stakeholder (researchers)

Conduct the actual study and interpret the results. The researchers have planned the study so that there is a pre-test and post-test and they've divided the kids into control and experimental groups. The researchers have set up a schedule when teachers should teach particular subject so that all the kids are participating at the same time and are studying the same topic. The researchers gather the statistical data from the system and are able to perform queries to the gathered data. All users' actions have been logged into the system and they're able to track every single users' path in the service. The data provided for the researchers has been anonymized so that they only know the gender and class of the student.

REFERENCES

1. Marjo Kauppinen et al. From Feature Development to Customer Value Creation. 2009 17th IEEE International Requirements Engineering Conference. 1090-705X/09.
2. Marjo Kauppinen lecture slides. Requirements Engineering. 2012.
3. Victor Robledo-Rella, Pekka Toiminen et al. Design and evaluation of mobile learning resources in mathematics for public elementary schools in Mexico. Conference proceedings, iadis mobile learning, March 2012.