Software Project Management 2015/2016

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Assignment 1

Project Proposal
The smart fridge shopping list

Version 0.2

History

Version	Date	Author	Remarks
0.1	09/27/2015	Filip Michnik	Creation of document
0.2	09/27/2015	Amélie Lagadec	Benefits
0.2	09/27/2015	Wang Yongjian	Risks
0.2	09/27/2015	Filip Michnik	Objectives
0.2	09/27/2015	Stefan Vikoler	Length

Table of contents

1 Introduction

1.1 An analytics App for refrigerators in the context of smart homes

This report elicits key points of a software projects which purpose is to develop an application for Smart phones. This application allows its user to analyze data that is generated by a smart object (refrigerator) in an efficient and intuitive way.

In a first step the reader is given a short introduction to the Internet of things, smart objects and the context of the smart home.

Section 3 presents the main objectives of the application and tries to frame its requirements in a first draft.

Section 4 analyzes the length and requirements of a potential project from a software management perspective.

In Section 5 and 6 the potential benefits and risks of this project will be discussed.

1.2 Internet of things, smart objects and the smart home

The Internet of things is basically a network of physical objects (so called "things") that had been embedded with software and equipped with sensors and network connectivity, thus enabling them to collect and exchange data with each other. These objects can analyze their environment and can be controlled remotely across existing network structures such as the TCP/IP Protocol. Objects have a unique identifier (such as their IP-Address) and in cooperate themselves into the existing Internet infrastructure.

"Things" can refer to a wide range of physical objects, such as manufacturing plants, cars, pallets in a warehouse or refrigerators, amongst others. All these objects are endowed with specific embedded software and sensors (e.g. RFID-Readers) that can generate data based on their input data. Smart objects can feed their observations into the existing Internet, thus allowing objects or applications to exchange information with each other.

The smart home is the environment created by turning physical objects of households into smart objects. Possibilities are versatile from smart stoves and pots, which automatically alert their owners, to smart refrigerators, with groceries that are equipped with RFID-Tags, allowing users to analyze their nutrition habits, inform them of shortages or generate shopping lists. The varieties of possible application are huge.

2 Objectives

The purpose of this project is to develop a mobile application which supports different mobile operating systems and allows its user to analyze the data generated by a smart refrigerator.

2.1 Problems

The interface of the refrigerator is not clear yet. Considering the fact that smart objects are a relatively new trend, general standards for interfaces are not established yet. It is necessary to cooperate in this aspect directly with the manufacturers to try and make sure proper APIs are implemented.

Equally, it is not clear which type of data and of which quality it will be provided by individual refrigerators. On a pure data level collections of timestamps of RFID-tagged groceries are imaginable. The application must be capable of transforming this machine generated data into semantically correct and human readable data.

It must also provide the functionality to connect itself via a networking protocol (such as TCP/IP) in order to access all the necessary data and deal with it appropriately. Real-Time data might be a challenge for existing data structures such as SQL based Databases.

2.2 Issues to be solved

The data must be enriched semantically, as in the sense of data analysis. Therefore it must be extracted, transformed and loaded in to some form of storage. A suitable data model must be developed, since the sensor data (such as RFID-Reader Timestamps) can be real-time data. It must be discussed if a Real-Time Analysis is necessary.

When creating the templates for the reports, usability and intuitively are of highest priority (see Target group). Generated reports must be clear and easy to understand, since the application is supposed to be used in daily situations.

2.3 Target group

In the context of the smart home environment, all age-groups and demographics can be potential users. It is not assumed that user have to be particularly tech-savvy.

2.4 System requirements

Smart refrigerators

Smart phones

3 Length

3.1 Number of month

At a time like this estimating the duration of the project is tricky issue, due to lacking information of all the specifications.

To deliver a working application to display all required informations (eg. shopping list) which is connected via TCP/IP to the smart object at home, we assume that there is already an interface implemented to read the data given from the object. Therefore the main effort is in planing developing an intuitive design for the customer and user of the (shopping list) app.

To achieve our goal we have to specify all requirements. This planning phase is estimated by two month, including all meetings whith the refigerator manufacturers, getting all informations about the API to communicate and all needed functionalities for the app.

Thereafter we can start to design and prototype our application regarding to the specified requirements. For this task we calculate a time period of another two month.

After finishing our first full functional app, we start to improve all designs and functionality, perform unit and acceptance testing until our final prototype and first productive application can be launched. This challange is estimated by three month more.

Then the project evolves to the support to maintain and possibly extand the application.

In total the development of an application suited for a smart home object requires 7 months.

3.2 Size of team

All this estimations are based on a four member team as we are now, assuming that we work in an already existing software company such that basic infrastructure and developing technics are available. In this case we do not need to spend a lot of time thinking about best ways of storing data, communicating via TCP/IP and go through design principles.

This team might contain one leading project manager and 3 developers/designers. In case of some problems, the team can be extended or tasks can be changed.

4 Benefits

The smart shopping list benefits the community of consumers in which every people belongs. Indeed, we don't have to create a shopping list anymore before heading out to the supermarket. The users will not have to change any behavior to maintain this inventory list and thanks to the application we never eat stale or spoiled food. Over time, we will be able to see the patterns of our food consumption and better manage our household budget.

5 Risks

1.If too many new features needed to be added.

2.If requirements changes out of control.

3.If there is no good quality assurance, the quality will not meets the requirements.

4.If there is no enough time budget to adapt the software to so many different android phones.

5.Other uncertain conditions.