Product Vision of a Data Analysis Tool

Boudewijn van Groos[1], Chris Langhout[2], Jens Langerak[3], Paul van Wijk[4], and Louis Gosschalk[5]

[1]bvangroos , 4229843
[2]clanghout , 4281705
[3]jlangerak , 4317327
[4]pvanwijk , 4285034
[5]lgosschalk , 4214528

May 8, 2015

Contents

1 Abstract

2 Target Customer

The target customer of our software is a group of skilled researching analysts of the ADMIRE project. The researchers are currently working on a system for renal transplant patients to keep track of their transplanted organ's values and thus keeping track of the organ's health. These researchers want to be able to analyze their patient's behavior. The analysis of the patient's behavior stretches from a case of manipulation of data to the extent of a patient's 'obedience' to a system's advice.

2.1 ADMIRE

ADMIRE stands for "Assessment of a Disease management system with Medical devices In REnal disease". ADMIRE aims to create an environment for renal transplant patients to monitor the health of their new organ and keep track of their health values on a website. From this website patients will also receive feedback regarding their values which might suggest visiting a hospital or remeasuring values. (Wang et al., 2013)

2.2 persona

Person: Wenxin Wang
Wenxin is a trained analyst, has high qualifications (Wang, 2015), and is capable of working with moderately complex computer systems. Wenxin likes software to be easy to use and wants results to be clearly visualized, though she is able to work with software which might be a bit more complex and thus a little less easy to use. Wenxin wants minimal repetition of actions so that she does not have to do any work which might as well have been automated.

2.3 customer

Our software will be used by a handful of people. All users are trained analysts who are capable of using a moderately complicated system. If our product will be used by the customer, they will use it to analyze all the patients involved in the Admire project. Users will be international, but all english speaking. Patients will most likely only be Dutch. The size of this group will probably be limited within the hundreds of people. Our product is not going to be sold, but offered to our target customer. We merely hope, in all modesty, that our project will be the best among others and thus will be used by our target customer in their research.

3 Customer's Needs

The product will address the need of the analysts to generate usable values such as means and averages from abstract data and create visualizations of this generated data. The customer needs to be able to

- load data from different sorts of sources consisting of varying structures

- create their own analysis

- execute their analysis on the loaded data

- create visualizations of the analyzed data

- output the analyzed data to a data format usable in additional software (e.g. SPSS).

This list is based on knowledge received from discussions with our customers.

3.1 Additional Needs

In the end, we want our software to be the best option for the analysts. Otherwise, the software might not be used. To achieve this goal, we have to try to satisfy additional needs of the customer which are not crucial but make the software more attractive and easy to use. There are a couple of factors which determine software usability. These factors include (but are not limited to) understandability, learnability, operability and attractiveness (Komiyama, 2008). While designing the SUGAR language (explained in section 4) and the graphical user interface, we will keep these factors in mind to achieve maximum usability.

4 Crucial Attributes

To satisfy the user's needs, it is crucial that the software will be able to recognize and process data of which the structure varies. It is also necessary that the software will offer a scripting language which enables the user to create their analysis which then can be used on the loaded data.

4.1 Analysis Language

A language will be created called SUGAR (van Groos, Langhout, Langerak, van Wijk, & Gosschalk, 2015). This language will

4.2 Visualisations and Exporting

The user will be able to see visualizations of their analysis which must be clear and meaningful. After the loading of data, creation of analysis, execution of analysis and visualization of the analysis results, the software must also be able to export the analysis results into a file so it can be used in additional analysis software.

4.3 Overview

The following attributes are crucial.

- Input module accepting specified data sources

- Simplistic analysis language

- Clear documentation of the language

- Visualize the analyzed data

- Export module with possibility to specify output syntax

5   Unique Selling Points

To know what makes our software unique, it is necessary to know which alternatives are on the market. When searching for data analysis tools, the names SPSS, SAS, R and Excel are the most prominent. The tool proving to be most relevant seems to be SPSS due to frequency of appearance. After an extensive search for a general definition of SPSS, the following description was found:

> "SPSS is a Windows based program that can be used to perform data entry and analysis and to create tables and graphs. SPSS has scores of statistical and mathematical functions, scores statistical procedures, and a very flexible data handling capability. Some of the functionalities of SPSS are: Descriptive Statistics, Reliability tests, Correlation, T-tests, Regression and curve estimation." (Abdelkareem & AL-Mekhlafy, 2014)

This description immediately shows some points on which we can improve with our software. For example; SPSS is windows based. Our software is written in Java and thus it can be used on any operating system. Another point of improvement is the list of functionalities that are given. Our target customer doesn't need these functionalities, so it would make the software needlessly complicated.

So the key to what makes our software unique is that it's personalized and therefor extremely usable. It is specifically created for analysts to process the data from renal monitoring devices, hospital records and the renal monitoring website. The provided language for creating analysis can be kept concise and simple because the purpose is so specific, the graphical user interface can be kept clean because it desires not too many extended features, which any other data analysis tool already has.

The company itself does not yet have software that compares with our software, but there are other groups working on the same assignment. This means we will have to outshine them in some way. Since the other groups have received the exact same assignment and the same description for the software's exact functionality requirements, we will need to create a software of high quality and usability to 'win'. We plan to do this by creating an easy and effective GUI and implementing as much automation in routine actions as possible. This will be achieved by using User Centered Design principles (Nielsen, 1993).

6   Time-frame

There's a time-frame of 10 weeks for the entire project. We aim to finish the product in week 9 so we will have the time to debug in week 10. Apart from the debugging, week 10 is very chaotic due to presentations and meetings so there will probably not be a lot of time in that week to develop much more. We also aim to have a working version continuously throughout the process of development. There is no budget, the team works free of charge and even pays tuition to be able to do this project.

References

Abdelkareem, K. H., & AL-Mekhlafy, N. (2014). Roof lateral displace- ment for gravity load designed rc frames subjected to earthquakes. *Journal of Engineering Sciences*, 654–654.

Komiyama, T. (2008). Usability evaluation based on international standards for software quality evaluation. *NEC Technical Journal Vol.3 No.2*, 29–30.

Nielsen, J. (1993). *Usability engineering*. Boston: Academic Press.

van Groos, B., Langhout, C., Langerak, J., van Wijk, P., & Gosschalk, L. (2015). *Language specification for sugar.* (https://github.com/clanghout/Health-Informatics-3/blob/master/docs/language/language-spec.pdf)

Wang, W. (2015). *Wenxin wang.* (http://mmi.tudelft.nl/?q=node/7622)

Wang, W., Brinkman, W.-P., Rövekamp, T. J., van der Boog, P., Alpay, L., & Neerincx, M. A. (2013). Feedback to renal transplant patients in a self-management support system. *European Conference on Cognitive Ergonomics*.