Context Project: Cultural Heritage

Monumentzo

Final report

Group 2

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1. Introduction

The final report, the beginning of the end to a period in which we learned a lot about the software engineering process, working in a team with a flat structure and the difficulties that can come with this. We also got a taste of the real world problems that can be encountered in software engineering projects.

This all resulted in Monumentzo. The goal of the system is to let its users learn about monuments in the Netherlands in an interactive, fun, intuitive and above all a simple way. In its current form it is possible for users to browse through them in a 3d environment while the monuments are ordered on selected criteria such as place or time. It is also possible for users to discuss monuments or leave stories about monuments.

This report outlines the key problems we were faced with and the solutions that we have applied to them. These can be found in the second chapter. The next chapter, chapter three, portrays and reflects on the way we worked as a team. In chapter four you can find the individual reflections of the individual team members. The fifth and final chapter chapter lists the lightweight SCRUM plans and our reflections for all the iterations.

In the end we can conclude that our context project was a fun time and more importantly a valuable learning experience.

2. Key problems and solutions

Like most other projects there are challenges the team has to face in order to get to a good application. The bar for this application was set reasonably high, and it goes without saying that we had our fair share of challenges and problems along the way. But there is a solution to every problem and a wayn this section we shall expand upon these problems and their solutions.

Problem: Unclear assignment.

> **Solution:** Contact stakeholders/mentor/teaching assistants and ask them to clarify what the objective and expected results are.

Problem: Time loss caused by the need of developers to get a feeling for new frameworks and libraries before being able to use them properly.

> **Ideal solution:** Pair up developers who are experienced users of the framework or library in question if they are available with developers who aren't.
> **Next project:** Reserve more time in the development planning when this problem may arise.

Problem: Lack of effective team communication.

> **Ideal solution:** Try to improve on communication by creating a team contract, do team building exercises and/or adhere to a development process model.
> **Our solution:** Talk about this matter with team members and teaching assistant.

Problem: Committed dysfunctional, wrong or uncompilable code or data.

> **Solution:** At least run/use the code/data once yourself before committing and fixing any problems before actually committing.

Problem: Lack of knowledge about software testing required to write correct acceptance and unit tests.

> **Ideal solution:** Train your developers as soon as there is time available to do so.
> **Our solution:** Procrastinate writing less important tests. Regression testing doesn't serve its full potential because we are working on a project for a relatively short time and with a small team.

Problem: Retrieving data from third-party resources.

> **Background:** The Monumentzo system has to use and supply the user with various kinds of data, ranging from textual tags to videos. This required to make use of a lot of different kinds of apis, some easy to use and some not.
>
> One particular set of data that was difficult to retrieve was the names of people and events related to a certain monument from a wikipedia article.
> **Solution:** In the end an xml file was requested from the wikipedia api and was analysed with the help of regular expressions. The pattern that was used contained grammatical restrictions which had to apply for the data in question.

Problem: Time is running out.

> **Ideal solution:** Hire more developers, have your developers work longer, remove certain features and/or lower quality standards.
> **Our solution:** Lower high-level feature quality standards while retaining a high low-level quality. This means that the webpage cannot have broken links but the quality of

the 'similar images' feature becomes less than optimal.

3. Reflection on the teamwork

From the beginning we chose not to have one person be the leader. This decision was not a bad, but it did have consequences we had not thought of at that time. Our teamwork was not bad, but there was certainly a lot of room for improvement. It could have been better. We could have been more effective for sure. The two points we were not good at were leadership and communication.

We all agreed that instead of one leader we would all take on this role. But thinking that this would all work well turned out to be a very idealistic approach. It is too easy to think: “Oh, somebody else will probably do that.”. So instead of four leaders we ended up with a mess sometimes or most of the time.

What we should have done is made some kind of contract at the beginning of the project. We should have declared proper rules with penalties for breaking them and should have specified our goals sooner. During the project we worked in an relaxed environment. Everyone had the freedom to creatively attack the problems at hand. Being a bit more strict within the group on for example attendance could have however spared us some unnecessary frustration from time to time.

If there had been a contract we had all agreed to and we enforced together, we certainly could have been meer efficient. Thankfully, we learned to work around each others flaws and with time things worked better.

Individually every team member put a lot of effort in this project. There was also the occasional pair programming as well. Checking each other work forced us to work together and communicate.

Because of the flat structure tasks were divided easily and flexibly. We tried to make it so that everyone had approximately the same number of estimated work to do. When someone got stuck on a task, someone else always readily helped out to solve the problem.

Communication was one of our biggest problems. Everyone was used to programming in a different way. This took some getting used to. It would have been easier if major implementation decision had been documented in a way.

We have certainly learned a lot about teamwork during this project. Which was exciting since this was our first big project where we had to do almost everything on our own.

4. Individual reflections on the project

4.1. Bojana Dumeljic

From the beginning it was not clear what this project was supposed to be. It took a while before we figured this out. It turns out it is very difficult to think of something that does not exist yet. All three the groups that are doing this project were doing the same thing. The small number of unique ideas that existed were passed on and copied quickly too.

I was very happy when we had figured out where we wanted this project to go. What we wanted to do with it. The decision to implement a 3D browsing option was certainly motivating. Everyone was more eager to work when we had decided on this. It was a thrilling new possibility. We had not done anything like it before. I would have liked to do more with it, but I am satisfied we got it to work this way.

Notwithstanding the problems we had within our group with leadership and communication, or maybe because of these problems, this project has been a very valuable learning experience. Especially about everything involving the software engineering process, teamwork and the importance of fulfilling deadlines and making your team do the same.

4.2. Kevin de Quillettes

After the first presentation, where we got to hear what the assignment was, it was clear to me that my expectations of this context project were completely off. I had the idea, as most of us had in my opinion, that we got a more complete dataset then we got and that we used that dataset and some “magic” to enrich the user experience for people that normally don’t like anything that has something to do with monuments.

At that time I thought that the assignment was boring and too difficult, but in the end I think that we pulled off some pretty cool stuff, like tag extraction and a 3D browsing environment and I must say that this project isn’t as boring as it sounded in the beginning.

Then there was the problem with the first couple of documents. I was under the impression that only a couple of people really knew what was expected in those documents, but looking back on that I think that everybody, including the teachers and TA’s, handled that pretty well.

Finally we had a complete quarter to implement all the ideas and plans that we made.
We started this period with a little setback because of the aforementioned design and implementation documents, but nevertheless it was a valuable lesson about project planning and how we could get everything back on track. In my opinion we also got a valuable taste of the problems that we can encounter when we work in teams and how these needed to be solved.

All in all I think of this project as an unique project from which I learned a lot about designing and building a piece of software in the first place and secondly about team dynamics and how each and every team member can influence a team.

4.3. Mick van Gelderen

The subject-matter of the Cultural Heritage project was different from what I expected. I was hoping to learn more about techniques that are employed to enrich cultural heritage such as user profiling, tag extraction and semantic searching by developing and testing these techniques. In the end, we were just chaining multiple libraries together that do all the work for us to create a functional product. Although this can be very rewarding, it was not what I had expected from the project at the start.

The project did not start off very good because the assignment wasn't very clear to us. Once it was clear, we discovered that multiple products already existed on the web. This wasn't very motivating and made it quite a challenge to come up with a good and original idea. Eventually we selected some common functionalities and added 3D browsing as our main feature. Three dimensional web applications are quite new and unsurprisingly, it was a huge moral boost when we got the first prototype up and running.

Every group project I have followed so far has been a unique experience, and this project was no exception. The most prominent difference with other projects was that we had almost zero motivation at some point. It was nice to experience that the project started rolling again when we completed a small piece of visual functionality. This little step forward, a visible step forward, in the process was rewarding for all the team members.

There are a couple of things I could have done better during the process. I found it hard to think very good about the project planning and I believe I'm not the only one. This became apparent as soon as we started to write code according to our designs because we had to make tons of changes. In the next project I will try to really get the right mindset when creating the design documents.

Though the road our team took through this wild course was very bumpy, it gave us the opportunity to learn a lot about working in teams in general and working as a team of developers, both of which are important skills to master.

4.4. Salim Salmi

We had a rough first half of the project. During the planning and documentation phases a lot was unclear or was misinterpreted. Because of this we had to do a lot over which in turn caused a late start with the beginning of the actual implementation.

Lack of proper communication was another problem we had this project. Sometimes we would not adhere to the scrum plan we made for that iteration.

Nonetheless I think the good points of this project far outway the bad ones. Our group had a really relaxing and confidential atmosphere. This caused for me personally to not really worry about if we would finish the system in time which in turn causes less stress and more productivity.

Also out of all the groups I thought that our idea for the project was the most creative and fun to do. A 3D environment was a really cool feature and gave everybody more motivation. The result was also really astonishing.

Even though we were really behind we still spend a lot of time to make sure the implementation was of high quality instead of rushing it to catch the deadlines in time.

This project taught us that freedom is good but too much of a good thing is a bad thing. It is necessary sometimes to be strict.

5. Lightweight SCRUM Plans

This chapter holds the lightweight SCRUM plans for each iteration. Each plan contains the planning for that iteration and a short reflection.

For each planning we have determine which tasks are to be performed for each feature that is to be implemented during this iteration. Each task is assigned a group member that is going to perform the said task. There is also an estimation of the time that this will cost. The actual time it took is added at the end of the iteration. If it occurs that another person than the assignee has worked on a certain task as well then this person's name is added to the table at the end of the iteration together with the number of hours they worked on the task. This information is all presented in a table.

The reflection is focused on the main problems that were encountered during the iteration and the adjustments that were made to the iteration planning.

5.1. Lightweight SCRUM Plan #1

5.1.1. Iteration Planning

Feature			
Task	**Assignment to group member**	**Estimation of time**	**Actual effort**
Set up			
● Set up server	Bojana	2	2,5
● Set up git repository	Mick	0,5	0,5
● Set up Kohana ○ Install Kohana ○ Add submodules ○ Configure installation	Bojana	2	3
● Check set up	Mick	0,5	1
Set up database			
● Make tables ○ User ○ Monument ○ Comment ○ ...	Kevin	1	3
● Make relations	Kevin	0,5	0,5
● Check set up	Bojana Mick	0,5	4 3
Register / Log in / Log out			
● Temporary register page	Salim	0,2	0,2
● User model ○ userID ○ username ○ password ○ emailaddress ● register() ● login()	Mick Bojana	2	10 4

• logout()			
• User controller ○ action_register() ○ action_login() ○ action_logout()	Salim Mick Bojana	1	1 3 5
• Unit testing	Salim	2	4
• Acceptance testing	Kevin	0,2	0,2
Gather information from external resources			
• Download metadata	Bojana Kevin	2	2 5
• Download Wikipedia articles	Mick	1	-
• Download images	Bojana Kevin	1,5	0 1
• Check is stored correctly	Kevin Bojana	0,5	0,5 1
Total		**17,4**	**41,2+**

Group Member	**Estimated Time**	**Actual Effort**
Bojana	8	
Kevin	2,2	10,2
Mick	4	
Salim	3,2	

5.1.2. Reflection

The main difficulty we faced in the first iteration was the database. It took a while to set it up correctly. When it was finally working and we started on the user model and controller, we found out that we had not followed the Kohana protocol for this task. After a lot of futile hours this finally resulted in an override of a few of Kohana's authorization methods.

The Kohana framework has a several useful modules for validation of data: auth,

validation and ORM. These three work closely together. The problem was that the framework had a specific model that it expects the database to adhere to for the modules to work. Unfortunately, we did not know this until after we had finished the database. After all the trouble we had gone through to set it up, we decided to override a few methods of those modules to list the database restrictions.

In the table from 5.1.1. the repercussions of the above problem are clear. The tasks for setting up the database, the user model and the user controller took far longer than expected. It also took more people than expected. The task switched assignee twice before it was finally finished correctly.

Because of the set back with setting up the database and the user login and register system, we had a pretty big time-setback right from the first iteration. We were however determined to be back on track by the end of the second iteration.

5.2. Lightweight SCRUM Plan #2

5.2.1. Iteration Planning

Feature			
Task	**Assignment to group member**	**Estimation of time**	**Actual effort**
Lire			
● Make index	Mick	1,5	2
● Obtain graphically similar	&		
● Store similarity in database	Kevin	1,5	1,5
● Check Lire	Bojana	1	
Tags			
● Extract tags	Mick	3	0
● Select relevant	&		
● Store relevance in database	Salim Kevin	3	0 5
● Check tags	Kevin	2	1,5
Gather external information			
● Wikipedia	Salim	5	15
● Google Books	Bojana	2	15
● Wikibooks	Kevin	2	-
● YouTube	Bojana	2	3
● Vimeo	Bojana	2	-
Search function			

• Query name and place	Kevin	3	6
• Search results view	Bojana Salim	1	0 1
• Unit and acceptance testing	Mick	2	
View monuments (part I)			
• Metadata	Salim	3	10
• Images	&		
• Map	Bojana	3	3
• Architectural attributes	Kevin	2	3
Acceptance and unit testing	Mick	2	
Total		**17,4**	**15,7+**

Group Member	**Estimated Time**	**Actual Effort**
Bojana	**11**	
Kevin	**8,5**	17
Mick	**8,5**	
Salim	**11**	26

5.2.2. Reflection

We started this iteration with a big setback from the first iteration. This meant that the tasks for this iteration were pushed back until most of the tasks of the first iteration were done. One of the important tasks that was postponed was the gathering of the information from Wikipedia. Afterwards this wasn't the right decision, because this meant that the gathering of the rest of the data couldn't be done.

Other risky and important features that had to be done this iteration were the lire image indexing, the tag extraction and the search function. The basic functionality of these tasks were done on schedule, only the little bugs were fixed in the next iteration. The monuments view was completed for the data we had.

We postponed the testing of all parts that could be tested to the last iteration, because there wasn't any time left to do this without taking a little time of the third iteration.

5.3. Lightweight SCRUM Plan #3

5.3.1. Iteration Planning

Feature			
Task	**Assignment to group member**	**Estimation of time**	**Actual effort**
Browsing function (part I)			
• Setup 3D environment	Kevin	6	2
• Load monuments as blocks in environment	&		
• Action performed when monument is clicked	Salim Mick	6	2 10
• Test the browsing function (unit & integration & acceptance testing)	Bojana	5	-
View monument (part II)			
• Extend the monument view with extra attributes (See test & implementation)	Kevin Salim	3	1 5
• Test the monument view (acceptance testing)	Salim	1	1
List			
• Controller classes and models	Salim Kevin	3	2 3
• Views	Kevin Salim		3 2
• Test controller (unit & acceptance testing)	Mick	2	
Total		**40**	**4+**

Group Member	Estimated Time	Actual Effort
Bojana	10	
Kevin	10	9
Mick	10	
Salim	10	

5.3.2. Reflection

This iteration suffered heavily from the tasks that still needed to be done for the previous iterations. A lot of tasks have been completed during the 3rd iteration but they were mostly from the 1st and 2nd iteration.
Setting up the 3D environment went really smoothly however. Clicking on the monuments is not working perfectly yet but they are loaded as blocks made of the monument image. The views for the lists have not been completed yet but the controllers and data models are working.

5.4. Lightweight SCRUM Plan #4

5.4.1. Iteration Planning

Feature			
Task	**Assignment to group member**	**Estimation of time**	**Actual effort**
Browsing function			
● 3D ordering	Salim Mick	6 6	 2
● Settings menu	Kevin Mick	3	2 1
● Testing	Bojana	3	4
Comments			
● Commentaar lijst bij monument	Kevin	3	2
● Commentaar kunnen geven	Mick	2	
● Testing	Salim	2	6
View monument			
● Finetuning	Bojana	6	5
● Testing	iedereen	1*4	
Total		**35**	

5.4.2. Reflection

The fourth the project is much smaller than the other iterations to make room for any delay caused by complications. The only large task in this iteration is the browsing function. During this iteration we caught up a lot in lost time, but did not finish everything that was planned for this iteration because of it. The long delayed external information from wikipedia gathering was almost finished at the end of the iteration. The comment function was mostly finished with only a few bugs remaining. A lot of progress was made with the list view.

Unfortunately hardly any of the testing that was planned was done during this iteration. Other things that still aren't finished at the end are the 3d ordering of the browsing function, the list

view and the monument view and most of the unit and acceptance tests.