

Process report



FIRST version

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# Overall process

The process of developing application for Traffic Control was separated in two parts and it took 15 weeks to complete.

The first period was mostly concerned about the structure of the project and the planning. Also, specification, functional and non-functional requirements.

Most of the documentation of the project was made in this period:

* Project Plan - describing the project as a whole, describing the developers, being students, and the product being the assignment.
* User Requirements Document - describing the requirements set by the client.
* Design Document - describing the structure of the software application to be built. Class diagram and Sequence diagrams were illustrated.
* Test Plan - describing the testing way of the application to be created. All the situations were covered, with all the needed exceptions and “monkey” behaviors.

The process of making those documents, consisted of team discussions and discussions with the client, specifying various requirements and specifications.

The Second Period of the development was mostly concerned with code implementation of the “Traffic Lights Simulation” software application. The program was based on the previously specified documents and modified during the implementation. Developers were working on the project using Agile approach.

### Week 1

Roles were assigned as follows:

* Bilger Yahov - being the Project Leader
* Oleksandr Suprunenko - being the Chairmain
* Ilia Nikushev - being the Quality Manager
* Georgi Chishirkov - being the Agenda keeper
* Lyubomir Dimov - being the Minutes keeper/Secretary
* Mengchuan Liu - being a girl ☺

All Minutes can be found in Appendix A, all Agendas can be found in Appendix B.

In week 1, the project was completely new area for the group members. We (the group members) started working on first version of the Project Plan in which we had to specify Deliverables and deadlines for the project. We had our first meeting. The teacher gave us further instructions which were not specified in various documents, we spoke with the client and we obtained clearer vision of the project’s objectives.

For week 1:

* Group meeting (only with the group members) – discussing Project Plan and the project in general
* Individual work (work was separated between group members)
* Meeting with the teacher and client
* Plan for next week
  + Project Plan work separation
  + Deliverables, Deadlines which are going to be specified
  + Project Constraints
  + MOSQUITO
* Handed in:
  + Initial version of Project Plan

### Week 2

In week 2, the project was almost complete. The group members) started working on first version of the URS in which they had to present the functional, nonfunctional Requirements and the User Interface. A meeting with the teacher and the client was held. The teacher gave feedback on the initial version of the Project plan and gave instructions about the URS. The client specified requirements, mostly by answering questions given by the team members.

For week 2:

* Group meeting (only with the group members) – discussing URS
* Individual work (work was separated between group members)
* Meeting with the teacher and client
* Feedback on Project Plan
* Initial Draft of User Specification Document was made and presented to the teacher
* Plan for next week based on feedback
  + Work on finalizing the Project Plan was separated in the team.
  + UI was needed in the Design Document
  + Some Use-cases had to be combined, some shortened and some deleted. There should be consistency between the final project and the Use-cases
  + Wrong usage of Nonfunctional requirements (expressing qualities with wrong words)

### Week 3

In week 3, Final version of the Project Plan was handed in. The URS was almost done and feedback on the current version was given. Work on Design Document and Test Plan has already started. Client specified new requirements which had to be given in the URS, and the teacher gave us feedback on mistakes we had made.

For week 3 we had:

* Group meeting – URS was almost finished. Discussion about Design Document what classes are we going to have and how to make connection between them.
* Individual work – Separated for URS/Design Document/Test Plan
* Meeting with the teacher and client – new requirements specified
* Feedback
* Plan for next week based on feedback
  + URS has to be finished, mark was to be given till the end of the week
  + Some classes were not needed and the class diagram in general needed some shrinking
  + In general, the teacher liked the class diagram. It had to be implemented in Visual Studio, to generate code. Minor changes on the classes had to be made

### Week 4

In week 4, Design document was on the go. Class diagram and sequence diagrams had to be made, a decision that code generated by visual studio will be made. We had some issues in implementing it in Visual Studio, some bugs were encountered. Initial version of the Design Document was structured. Test Plan was also prepared, the document had to be very clear, so that even person who is not part of the project could read it and successfully finish it.

For week 4:

* Group meeting – Discussed class diagram, sequence diagrams and test plan
* Individual work – Implementation of Class diagram in Visual Studio, Sequence diagrams made with some nice tool and Test Plan was started
* Meeting with the teacher and the client, getting feedback on Design Document and Test Plan and also receiving mark for URS
* For next week the group separated the work so everyone gets equal amount of work
* Initial version of Test Plan was given
* Initial version of Design Document was given
* Work for Design Document and Test Plan was separated in the team

### Week 5,6,7

In weeks 5,6,7 Final versions of the Design Document and Test Plan was handed in. Feedback were received on meetings with the teacher. The client specified further requirements he had.

For Week 5,6,7:

* Final version Design Document week 7
* Final version Test Plan week 5

### Week 8-15

In weeks 8-15, Implementation phase was in progress.

* The team worked with high awareness of specified requirements and deliverables in the documents.
* The functionality of the system had to be made as much as possible like specified in the sequence diagrams.
* Little to no changes were made on the class diagram
* Various issues were encountered, which were resolved by cooperative work of the team
* Group meetings were held every week.

# Understandings made with the group and the teacher

#### Requirement Specification

During the work on URS, various problems were encountered, feedback was received from the teacher and that gave the team new level of knowledge for functional and nonfunctional requirements.

Understandings made during URS:

* How to properly write Use-cases, so they be consistent and good to read
* How to combine Use-cases
* How to separate Use-cases
* How to expand Use-cases
* What is the goal of nonfunctional requirements and how to reach it
* How to separate work in doing Functional and Nonfunctional requirements
* What are the main qualities of the User Interface and how to make it easy to use
* How to communicate and discuss problems about functional and nonfunctional requirements

#### Designing

During the work on Design Document, we had to make a class diagram which took us a lot of time and needed a lot of communication in the group.

Understandings made during Design Document:

* How to make proper separation of the classes
* What major issues might occur when implementing the project (the class diagram might need changes during implementation)
* Where we need to use Generalization
* How to make proper Sequence diagram and what are the things about sequence diagrams that we have to keep in mind
* How will be handled mistakes made in the initial class diagram during implementation
* How to separate work and communicate during work on Class diagrams and sequence diagrams
* How to generate documentation automatically from Visual Studio

#### Implementation of the software application

The implementation was the hardest part of the project. Many problems occurred and difficult situations had to be handled. First thing that has to be done is to place the project on stable environment where everybody could work – used GitHub for that. For improving of communication, scrum meetings were held and Changes on the initial version of the class diagram were made, some entities were deleted, some were added and most were expanded. The final version of the project was a big achievement for everybody of the group. The project was successful and gave a lot of knowledge to everyone in the group.

Understandings made during Implementation of Traffic Lights Simulation:

* How to use GitHub (using Git Shell)
* Communicating with group members during implementation of a project
* Scrum meetings
* Changes on initial version of class diagram. How to expand the classes
* Using graphics and drawings in C#
* Creating components and display them using their coordinates
* Making connections between objects using another object
* Serialization, Saving, Loading files
* Making undo functionality of application
* Being consistent with URS/Design Document
* Using the use-cases for the application functionality
* Finding solutions working as a group
* Documenting and commenting the project

# Separation of work

# Personal Evaluations

### Bilger Yahov Evaluation

### Lyubomir Dimov Evaluation

The project was a big challenge for everyone from the group and our ambition to make it perfect was driving us forward. The cooperation in the group was perfect, we rarely had any disagreements, we rather discussed and the problem and made solutions.

In the beginning of the project I didn’t have any clue how are we going to do the project and how is the final product going to look like. The process of making use cases and after that UI, designing the class diagram and constructing sequence diagrams gave me almost clear vision of what we wanted in our application.

In the beginning we had to discuss and think about functional and nonfunctional requirements of the project. This was a very tricky part in which I had to think forward in the future about what might happen, how is the application supposed to behave. We came up with ideas which were accepted by our teacher, he also gave us feedback on how to express ourselves in the use cases.

After finishing the URS, we knew what are the functional and nonfunctional requirements. We also had an idea of what kind of User Interface we are developing. Now was time for Designing the class diagram and making sequence diagrams based on the previously specified use cases. I learned many things from them during the phase of designing the class diagram, Ilia and Georgi were the people who did most of the class diagram and I really liked their approach. We had meetings and a final version of the class diagram was finished, followed by sequence diagrams on which I worked hardly.

During the implementation phase, we worked in a very structured way, we tracked the tasks and tried to develop in Agile approach. It was very interesting to work in a group like this. I learned extremely much and I am very satisfied. My colleagues showed me many tricks and I learned some new skills. The project was very challenging but the final result is very satisfying.

I am glad I participated in this course and I was in a group with such a nice people.

### Ilia Nikushev Evaluation

I am disappointed at how this project had been given so many years in a row. We were tempted to use already done solutions, but we went for our own, so we would make good practice. This project would have been a lot better to be made in Agile, from start to finish. The documentation is pointless if the product is not working, you cannot plan every single step in advance.

For future projects it would be better to not use Sequence Diagrams; Use Cases. In the Development phase, Use cases are pointless. Instead of wasting time on Use cases, it would be better to use something similar to Flow charts, as they depict the IDEA of how an activity should work, and its outcome, not word by word. A programmer does not need documentation when they can read the code for themselves; they just need to plan out how things are made. Most programmers stick to Pseudo code.

The team had its flaws and not everybody had the same amount of time to spend on the project. In the end we made it through and got to a good solution.

I personally did not learn anything new.

I tried to lower my standards for quality of the project, due to not all participants having the same level of knowledge, but it difficult to make a good project with rotten design.

Overall the project was ok, nothing special. Would have been a lot better if it was a real life project, or aimed to ‘Innovate’.

### Georgi Chishirkov Evaluation

Overall the project left me with a positive impression. The task had been given for a few years before us but we managed to make it our own. As always we had to do a lot of unnecessary documentation which only proved to waste time and had no real effect once we started writing the code.

For future projects I think Fontys should come up with a newer idea and maybe throw away having to do another waterfall project like ProP. Focus on something that could be ideal for an agile way of programming.

The team was definitely the best I have worked with during my time at Fontys. I wish more projects would let us take 6 people since this lets us divide the work far better. As always there were one or two things that were left out that I would have liked to see in the project, but we decided to focus on the core of what we promised instead.

I did learn a few things from working with the synchronization of traffic lights and cars. Overall I was happy with the work during the implementation phase not so much with the starting documentation phase.

### Mengchuan Liu Evaluation

Even though the project is old, it is still a good practice for me.

This last several months, I really worked on improving my teamwork skills. I had a much better understanding of team dynamics and how to contribute more effectively in the various roles and stages of team development.

I struggled a bit in dealing with my tasks. My colleagues, especially Bilger, tried a lot to help me. He explains me how to start my tasks and helps me to fix my errors. I did learn not only from my tasks, but also from my colleagues’ part. And in the end, we manage to make a good project.

Overall we have a great team and finish our own beautiful project. But it is better to come up some new projects. As a student, we always have more willing to work on a new project.

### Oleksandr Suprunenko Evaluation

In general I am quite satisfied with the project. We were working as a real team, helped each other if it was needed, tasks were split. So everybody had some tasks to do. All this gave me some feeling that it is a real project, not just subject in the university. In addition, people in my team had more knowledge than I so I learned some new things.

However, I did not like the first part of the project. We had to deliver all final versions of documentation during first block. It was actually before starting implementing the application. This way of working is the same for all subjects where we have to write our own application. I really do not understand why it is still happening like that. We are learning about agile approach but so far we did not use it as it has to be and we are not allowed to do so due to conditions of the subject. It is very disappointing as I hoped to receive as much new experience as possible. However, currently it looks like we are just repeating what we learned so far.

# Appendix A: Minutes

Date of Meeting: 24 – Feb– 2016

Time: 13:00 - 13:20

Minutes

* Everyone attended the meeting.
* The development method will be discussed next block.
* For grading the process of work is also important
* Work has to be separated evenly
* At the end of each black there is a peer review
* The client talked with one of the teachers about the project
* The client has more information what he really wants and he has no professional background.
* The city is small about 3000 villagers, but in rush hours the cars are much more than usual
* The program should be able to simulate types of crossroads and the actions going on this crossroads.
* The program has to be able to simulate crossroad action with pedestrians, cars, ambulance.
* The final outcome that the client wants is that there should be no accidents
* It should be possible to simulate different types of situations
* In the program there should be a matrix of 3x3 – 9 crossings
* Pausing the simulation should be possible.
* The client should be able to give an input to the application – number of cars, number of pedestrians.
* There should be possible to block one of the roads – road maintenance
* No parked cars will be illustrated on the simulations
* Saving the simulation should be possible
* Undo action should be possible
* Unlimited number of cars and pedestrians
* Preparation for next meeting is important.
* Good agenda should be prepared.

Date of Meeting: 29 – Feb– 2016

Time: 13:00 - 13:20

Minutes

With teacher:

* Everyone attended the meeting.
* Feedback on the project plan was given
* Project plan is almost complete
* Project plan should be written more formal
* We should be more flexible with the roles in the project, we should change regularly
* Net 3.0 was chosen because of compatibility
* Project risks are nicely specified
* Concrete dates for the milestones has to be specified
* We should be working with concrete schedule
* Test plan for the specification, not a unit testing
* Second page of the PP has to be placed on the Organization

With Mr. George

* Undo/Redo - if possible the client would like it
* Start application UC
* Install application UC
* Copy a crossing UC
* Statics about how the stimulation is done with a specific layout
* Moscow has to be made about the requirements

Date of Meeting: 7 – March– 2016

Time: 13:00 – 13:45

Minutes

With teacher:

* Everyone attended the meeting.
* Milestones written in the project plan were mistaken and changed during the meeting
* Project plan was graded with a grade 6,5
* Final Version of URS has to be delivered by Friday night
* In the use cases, all kind of exceptions should be handled
* Use case Loading Grid has a mistake
* We should be more concrete about pedestrians, not so vague
* Sensor has to be specified
* UC #23 has to be substituted
* User interface in the URS document has to be specified as an initial version
* MoSCoW changes – more things should go on Must, and some has to be in coulds
* How are the accidents going to be simulated?
* Sequence diagrams for all musts

With Mr. George

* Graphical user interface was explained to the client
* The format of the results of simulation was settled.

Date of Meeting: 14 – March– 2016

Time: 10:30- 11:00

Minutes

With teacher:

* Everyone attended the meeting.
* URS review was given
* New use case has to be specified “Set Green Time”
* Variation in the green time should be possible
* The group has to think of implementing rotating a crossing
* Mark 7 for URS
* Test Plan review
* With test plan we should be as specific as possible
* To be able to test monkey behavior
* Column with preconditions for tests in Testplan
* Class diagram has to be specific

Date of Meeting: 21 – March– 2016

Time: 13:00 – 13:20

Minutes

* Everyone attended the meeting.
* The preconditions were not very clear in each Test case - for example: Starting simulation
* The testplan has to be made in a way that person who is outside the project can make the tests only by looking at the testplan.
* Undo/Redo precondition in the testplan should give more information about the situation
* Class diagram has to be displayed in a UML notation
* In sequence diagrams – when specifying objects and classes they has to be present in the class diagram of the project.
* Sequence diagrams has to be based on use cases from URS
* GUI is satisfying
* There is no need of crossing rotation

Date of Meeting: 24 – March– 2016

Time: 13:00 - 13:20

Minutes

With teacher:

* Everyone attended the meeting.
* Vague feedback on testplan
* By “#” we denote a protected data field
* Sequence Diagrams and use cases have to be connected
* Mr.Kuah accepted the reason we use ‘X’ in sequence diagrams
* Update interface in the MainForm will be updating the graphical user interface and repaint
* Teacher keeps the feedback vague because he wants us to learn by ourselves

Date of Meeting: 01 – June– 2016

Time: 13:30 – 13:50

Minutes

* Do synchronization between components this week
* Next week, have stable prototype
* Process report - have individual contribution
* Presentation - free, talk what you have created, if proud talk about it
* After week 6 - have working prototype and send it
* Polish bugs afterward
* During assessment, if they worked on it they should be able to answer questions
* Turn off resize
* "is good" - Kuah 2016

# Appendix B: Agendas

## February 22, 2016

13:00

Type of Meeting: Questions and introduction

Meeting Chairman: Oleksandr Suprunenko

Invitee: Chung Kuah

1. Greeting,
2. Assigned roles within the team,
3. Project plan draft questions.

## February 29, 2016

13:00 pm

Type of Meeting: Feedback and review

Meeting Chairman: Oleksandr Suprunenko

Invitee:

1. Chung Kuah being the teacher
2. Mr. George being the client
3. Greetings
4. Assigned roles within the team
5. Open issues
6. Project Plan draft remarks
7. Additional questions

* Use of the provided DLL from Fontys

1. Adjustments ( if any )

## March 7, 2016

13:00 pm

Type of Meeting: Feedback and review

Meeting Chairman: Oleksandr Suprunenko

Invitee:

1. Chung Kuah being the teacher
2. Mr. George being the client
3. Greetings
4. Open issues
5. Project Plan final remarks
6. URS document remarks
7. Adjustments ( if any )
8. Agree on time for next meeting

## March 14, 2016

10:30 am

Type of Meeting: Feedback and review

Meeting Chairman: Oleksandr Suprunenko

Invitee:

1. Chung Kuah being the teacher
2. Mr. George being the clien
3. Greetings
4. Open issues
5. Test plan - remarks
6. Improved URS – remarks
7. Additional questions
8. Adjustments ( if any )

## March 21, 2016

13:00 pm

Type of Meeting: Feedback and review

Meeting Chairman: Oleksandr Suprunenko

Invitee:

1. Chung Kuah being the teacher
2. Mr. George being the client
3. Greetings
4. Open issues
5. Test plan final version – remarks
6. Design document – first version
7. Additional questions

* Agree on the use of rotate functionality with the client.

1. Adjustments ( if any )

## March 24, 2016

12:30 pm

Type of Meeting: Feedback and review

Meeting Chairman: Oleksandr Suprunenko

Invitee:

1. Chung Kuah being the teacher
2. Mr. George being the client
3. Greetings
4. Open issues
5. Test plan– remarks
6. Design document – remarks
7. Adjustments ( if any )

## April 25, 2016

09:00

Type of Meeting: Feedback and review

Meeting Chairman: Oleksandr Suprunenko

Invitee:

1. Chung Kuah being the teacher
2. Greetings
3. Assigned roles within the team
4. Open issues
5. Documentation overall feedback
6. Peer reviews feedback
7. Adjustments ( if any )