Process Report

Fly High – Airline Management System

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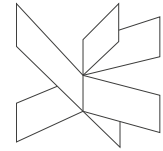
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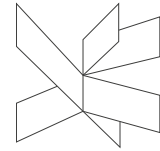
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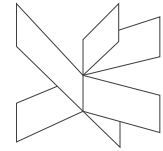**Information and Communication Technology Engineering**

2nd Semester

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Process Report – Fly High Airline Management System

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Preface

This report has been developed during an 18 weeks' project. We thank our supervisors and librarians at VIA University College for the assistance and guidance provided in a spirit of cooperation and goodwill.

1   Introduction

"If you figured it all out today, what would be the point of tomorrow?" – anon.

This anonymous quote can describe best our initial approach to planning the execution of the project. There is always room for improvement. Creating an airline management system is a complex task which requires attentive study of the current market demand, analysis of its issues and enhanced vigilance towards details. Therefore, the whole planning of the work and expected progress during the available time range has proved itself to be a demanding procedure.

SCRUM and The Unified Software Development Process were introduced to us early in the semester and can be accounted as extremely helpful in the work management. The two frameworks provided a beneficial way of organizing the work and keeping track of the progress. The burndown chart is a visual representation of the expected work flow and the actual flow. A small check of the chart offered us the possibility to examine the current work situation anytime by seeing how far behind or before the schedule we were.
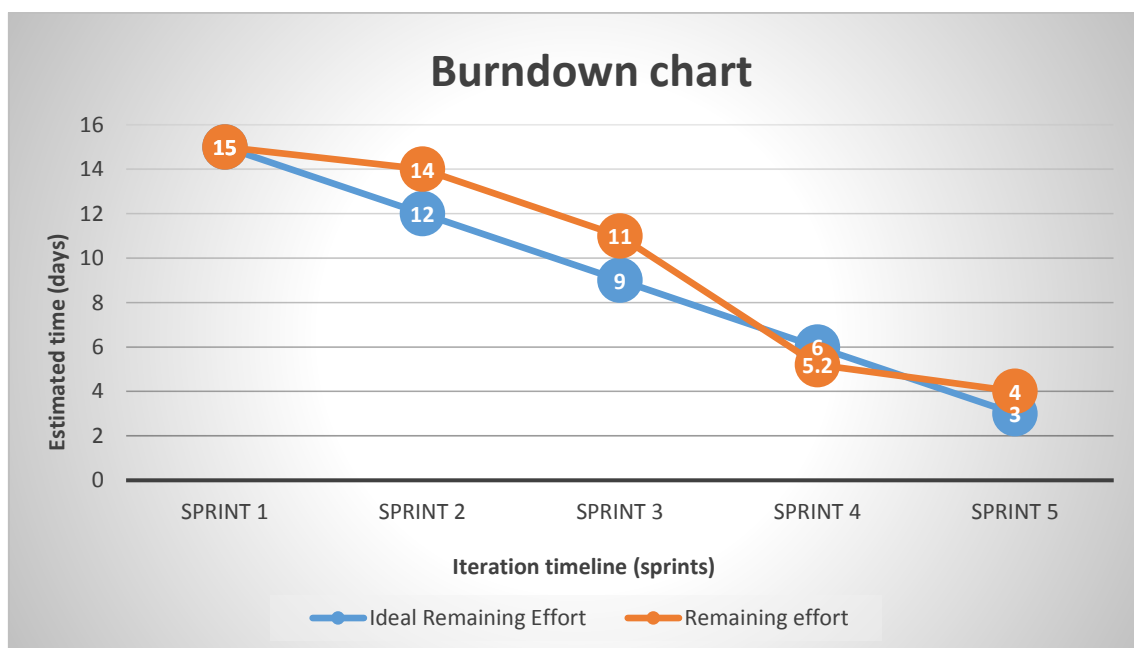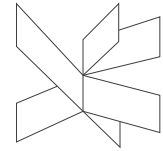

Figure 1 – Burndown chart

The work has been divided into five sprints and, as it can be observed in the chart, the ideal remaining effort, representing the ideal amount of work in a time range, it is not similar to the remaining effort, representing the actual amount of work. The work has been delayed during the first two sprints and we have been behind the schedule for a while. Sprint number three was the time when we managed to catch up with the work and even to go further in sprint number four. Even if in the end the planning and the actual implementation were nothing alike, we succeeded in accomplishing the main goal, creating a basic functional system, and gaining experience with group working. The only disadvantage of the system is that it lacks one of the main requirements, represented by a client-server architecture.

Overall, it can be concluded that the performance is satisfactory, the meetings' plan was respected and the general atmosphere during group work was pleasant. We tried to learn one from each other, share the knowledge, cooperate as much as possible to achieve the common objective and enjoy the work.

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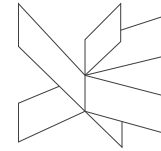
2   Group Description

The group consists of four members: Cristina Ailoaei, Dragoș Sîrbu, Michał Jurewicz and Michał Podgórni, originally from Romania, Moldova, respectively Poland. Analyzing the outcome of this new type of partnership from a cultural approach, the team members gained a lot of experience from such a collaboration by working with different people.

Prior to project start, we wanted to explore the strengths and weaknesses of the team by completing a team roles test in order to make sure that every team member is assigned to tasks which suits his/her aptitudes and therefore make use of his/her full potential.

Cristina Ailoaei comes from Romania. The result of the Belbin Team Roles test showed that she is a Complete Finisher and Coordinator. She strived to polish and scrutinize the work for errors and to clarify the goals. Her will to perfect everything made our project look substantially better.

Dragoș Sîrbu comes from Moldova. Through the Belbin Team Roles, his strengths associate him with a Specialist and Implementor. He made sure to provide the team with reliable knowledge and he is also known for turning the ideas into actions. His will of improvement pushed the project work further.

Michał Jurewicz comes from Poland. He identifies himself as an Implementor and a Plant through the nine Belbin Team Roles. His high creativity and way of solving problems in unconventional ways gave the project a fresh and an original look. Moreover, he plays the role of SCRUM Master and was responsible for organizing work sessions, dividing tasks and making sure the team members do not lose focus.

Michał Podgórni comes from Poland. Undoubtedly, he can be described as a Resource Investigator and Monitor Evaluator, as he explored opportunities to generate new ideas. He also provided a logical eye, making impartial judgements in moments where needed. Apart from this, he was our Product Owner, role which made him responsible for deciding which tasks should be our priorities and what the team should focus on.
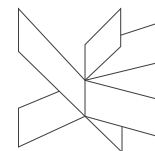
The following image is a representation of the team roles distribution and has as purpose increasing the self-awareness of each member towards the segments where they should be mostly active.

We acknowledge that the Team Role Circle is not a personal creation but has been adapted from a sample on "Belbin Team Report". The original version can be found at www.belbin.com . Also, the Belbin Team Roles tests for each member can be found in Appendices and contain the results from where the data has been extracted.

Key to Candidates

Cristina Ailoaei (C)
Dragoș Sîrbu (D)
Michał Jurewicz (MJ)
Michał Podgórni (MP)
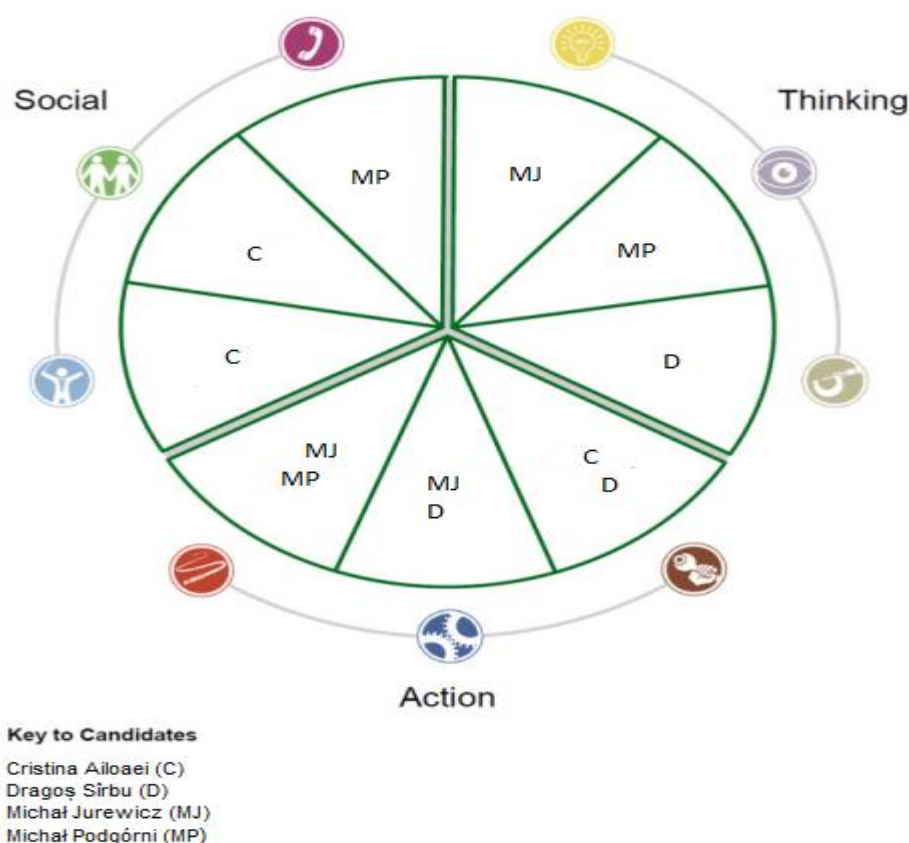
Figure 2 – Team Role Circle

The cultural differences are analyzed in the country comparison chart and description enclosed to the document. As it can be observed, the only significant difference between the countries Poland and Romania is that Poland scores twice as much in individualism, thing that can be explained by the fact that there is a slight concern for people to see the work done as soon as possible. The team could only benefit from

that, as we ensured that the process is not delayed. For the whole group, the execution of this project represents the second experience of this kind. We intended to use the experience gained in the first semester and the team work in our benefit by developing together our interpersonal and technical skills.
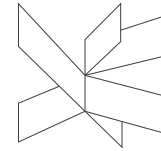
3   Project Initiation

Project initiation phase is one of the five officially recognized project management phases and is part of the project management life cycle together with description, execution, controlling and closing phases.

The early thing after group formation and right before starting to set the objectives of the new project was creating a SWOT analysis, which helped us to spot strengths, weaknesses and identify the opportunities and threats we might face.

Strengths	Weaknesses
1. Good Communication within the group - messenger, email 2. Safe way of sharing the work – github 3. Committed to the work – the overall motivation is high 4. Success in setting the meeting time 5. Good planning with agreed tasks on meetings 6. Diversity in the skills of team members – different belbin team roles	1. Lack of experience with SCRUM and UP 2. Very comfortable atmosphere 3. Loss of focus 4. Working speed 5. Bad planning
Opportunities	Threats
1. Possibility of using the library for extra help 2. Unlimited access to a place of study and meetings – university 3. Free access to different programs (Eclipse, Astah Proffesional, Microsoft Office) 4. Possibility of using the teachers to our own benefit	1. All the team members have a part-time job and lots of commitments, therefore they have free time to work on project at different times 2. Unpredictable changes in the product backlog, new requirements arising

The initiation phase encloses everything we have done before the detailed planning began, starting with clarifying the objectives and scope of the project. The group decided to undertake this project because its execution involves more than building and designing
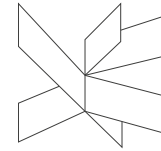
a system, as it is connected to people and created for them. This way, the project will not only mean a technical experience, but it will provide the team with better understanding of the human factor and its changing needs. Thinking from a different position, that of a user, will help the team to spot weaknesses and mistakes and will prepare it for future projects.

In order to give our project a sense of purpose from the early beginning, we have created a project charter which can be found in Appendices, setting the objectives and defining the authority of the SCRUM Master.

The next things we did was designing a RASCI Chart for the allocation of responsibilities to the team members, Product Owner, SCRUM Master and supervisors.

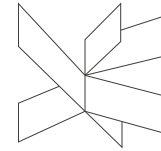| Activity	Team member	Product Owner	SCRUM Master	Supervisors
Project planning	R		R, A	C
Design	R	I	S	
Coding	A			C, S
Unit Testing	R, A	I	S	
Quality Assurance			S	C
Documentation	A	I		S

R = **Responsible**

A = must **Approve** work before it is effective

S = **Supportive** – can provide resources or can play a supporting role in implementation

C = to be **Consulted** – has information and/or capability necessary to complete the work

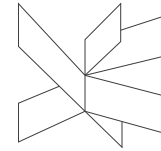**I** = to be **Informed**

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4 Project Description

As mentioned in the Introduction, creating an airline management system is a complex task which requires beforehand documentation on how the current problem of the company can be solved and what are the practices nowadays in this sector of activity. Therefore, the members' attention had to be increased towards small details that could make a difference between a good system and a system which strives to increase users' comfort. One example of a decision our group decided to include in the functionality of the system was making an option to search for cheap flights from your location if you are a club member, opportunity which cannot be found in many of today's companies.

The product backlog contains a list of everything that may be done during the project.

ID	Priority	Estimate	Item
1	Critical	40	A project report has to be presented in order to get a detailed system documentation.
2	Critical	32	A process report has to be presented in order to have a written documentation of the system development process.
3	Critical	28	As an administrator, I can add airports, airplanes, crew members and flights to the system.
4	Critical	16	As an administrator, I can find airports, airplanes, crew members and flights in the system.
5	Critical	24	As a head administrator, I can cancel flights.
6	Critical	28	As a head administrator, I can delete airports, airplanes, crew members and passengers from the system.
7	Critical	16	As an administrator, I can edit data for airports, airplanes, crew members, passengers and flights in the system.
8	Critical	16	As a customer, I can select departure and destination airport and the departure and return date (or departure only) for flights in order to get the available flights.

9	Critical	16	As a customer, I can enter personal information and choose a seat, size of luggage, method of payment in order to book a ticket.
10	Critical	16	As an administrator, I can select date/time range for flights in order to get flights in a specified range.
11	Critical	16	As an administrator, I can select cities for flights in order to get flights from/to the specified cities.
12	Critical	12	As an administrator, I can get a list of all flights and club members.
13	High	12	As an administrator, I can set the annual fee for club members.
14	High	8	As a customer, I want to receive the ticket via email.
15	Medium	8	As a customer, I can become a club member in order to get discounts.
16	Medium	10	As a customer and club member I can search only for cheap flights from my city.
17	Medium	6	As an administrator, I can maintain a FAQ section.
18	Medium	5	As a user, I can read FAQs so that I can find answers to different questions regarding flights.
19	Medium	5	As a user, I can subscribe to the newsletter in order to receive new information regarding flights and offers via email.
20	Low	10	As an administrator, I can log in the system in order to manage data.
21	Low	7	As a head administrator, I can see the profiles of all administrators.
22	Low	15	As a head administrator, I can create or delete an administrator account in order to ease the management of accounts.
23	Low	5	As a customer and club member, I can log in the system in order to take advantage of the benefits provided.

*It is assumed that a head administrator can perform all the actions of an administrator.
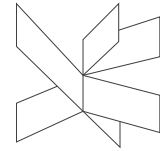*It is assumed that the estimated time refers to the work for the whole team (~ 350 hours).

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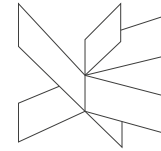
5   Project Execution

The execution phase of the project management life cycle has been asserted by us as the most complex phase, as it was going to reveal if the objectives have been correctly set and the plans could be easily put into practice.

A major difference in comparison with the first semester project were the working methods adopted. The waterfall method was abandoned for the Unified Process, stating that all steps in creating the project have to be done in small iterations, guarantying us easy recovery from changes and therefore more chances of success.

PB-ID	ID	Task title	Responsible	Estimate (days)	Status
All	1	Create a list of requirements	All	2	Done
3	2	Design & describe usecases for adding airports, airplanes, crew members and flights by an administrator	Michal J	3	Done
3	3	Create activity diagram for adding airports, airplanes, crew members and flights by an administrator	Michal J	1	Done
3	4	Start the analysis class diagram	Cristina	1	Done
3	5	Start the design class diagram	Michal J	2	Done
3	6	Include MVC in the design class diagram	Cristina	1	Done
3	7	Implement adding airports, airplanes, crew members and flights by an administrator	Dragos	4	Done
3	8	Test adding airports, airplanes, crew members and flights by an administrator	Michal P	2	Done
3	9	Document adding airports, airplanes, crew members and flights by an administrator	Michal P	1	Done

SPRINT 1 Backlog

SPRINT 1 Backlog is an example of a sprint backlog, where the main concern is adding data to the system, data consisting of airports, airplanes, crew members and flights. Apart from other responsibilities as creating a list of requirements, the sprint focused on designing, implementing, testing and documenting the product backlog item.

In order to show the overall administration of the project during the five sprints, we include the sprint reviews, which can be also found in Appendices.

SPRINT 1 Review

The SCRUM team presented to the Product Owner a functional piece of the product, represented by adding airports, airplanes, crew members and flights to the system.

As the Product Owner acknowledged that the overall goal of the sprint was met, the item at ID 3 has been marked as done in the product backlog. Moreover, the Product Owner changed the priority of creating a log in for administrators and club members from "Low" at IDs 20 and 23 to "High" at IDs 13 and 14.
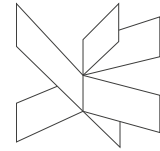
SPRINT 2 Review

The SCRUM team presented to the Product Owner a functional piece of the product, represented by finding airports, airplanes, crew members and flights in the system.

As the Product Owner acknowledged that the overall goal of the sprint was met, the items at ID 4 and 12 have been marked as done in the product backlog. Moreover, the Product Owner changed the priority of creating the booking a ticket functionality from "Critical" at IDs 8 and 9 to "Critical" at IDs 5 and 6.

SPRINT 3 Review

The SCRUM team presented to the Product Owner a functional piece of the product, represented by booking a flight.

As the Product Owner acknowledged that the overall goal of the sprint was met, the items at IDs 5 and 6 have been marked as done in the product backlog. Also, items at ID 13 and 14 and 17 have been finished. Moreover, the Product Owner decided to change the priority of items from "Critical" at IDs 10 and 11 to "Medium" at IDs 17 and respectively 18.

SPRINT 4 Review

The SCRUM team presented to the Product Owner a functional piece of the product, represented by cancelling a flight and deleting airports, airplanes, crew members and passengers from the system.

As the Product Owner acknowledged that the overall goal of the sprint was met, the items at IDs 7 and 8 have been marked as done in the product backlog. No other changes in the product backlog have been made.

SPRINT 5 Review

The SCRUM team presented to the Product Owner a functional piece of the product, represented by editing airports, airplanes, crew members and passengers in the system.

As the Product Owner acknowledged that the overall goal of the sprint was met, the item at ID 9 has been marked as done in the product backlog. Also, items corresponding to finishing the project and process report (IDs 1 and 2) have been completed. The team reflected on the unimplemented items from the product backlog.

The planning proved to be extremely helpful and, despite the fact that for both Michałs playing another role except the one of team member during meetings and not only was a bit unusual, we truly acknowledge that the SCRUM methods brought facilitation into work organization.

Finally, we ended up with a ready to use piece of software that is documented in an understandable way. Even though some of the planned tasks were delayed during the first two sprints, we succeeded to catch up during sprint three. Sprint five backlog still consists one item in progress.

Sprints retrospective have provided us the advantage of becoming more aware of what happens inside our group and how can we improve the performance. An example of SPRINT 1 Retrospective has been attached.
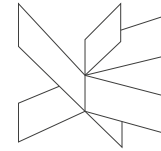
SPRINT 1 Retrospective

During sprint 1 retrospective, some ideas have been discussed and at the end they have been written down as the following:

What we should start doing:

- Pay more attention to the SWOT Analysis in order to make sure that every team member is assigned to the right task;

What we should keep doing:

- Organize working sessions outside of university sometimes;
- Ask for help every time it is needed;

What we should stop doing:

- Be too cozy, because it may decrease the productivity.

Further, a small part of the meetings plan has been extracted in order to show the overall process.
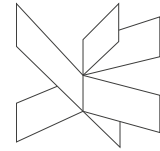
Group Meeting during SEP class, 08/02/2018, 8:20 – 10:00

What we did	Plans for next time
Formed the team; Wrote the group contract; Discussed about what topics could be suitable for the new project;	Come up with new ideas for the project;

Group Meeting during SEP class, 15/02/2018, 8:20 – 11:00

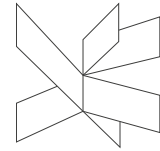| What we did	Plans for next time
Completed the group formation (a description of the new project, keywords, expectations for this new semester); Created a list of features; SWOT Analysis; Belbin Team Roles;	Choose a name for our fictive company; Learn to use GIT and UpSource; Come up with more features for the system;

…

Group Meeting during SEP class, 22/03/2018, 8:20 – 11:00

What we did	Plans for next time
Got an overview of SCRUM;	SCRUM Roles, Sprints, Group meetings and work; Start to work on Product backlog;

Group Meeting during SEP class, 05/04/2018, 8:20 – 14:00

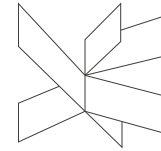| What we did	Plans for next time
Finished the Product backlog;	Prepare for sprint#1 start;

6   Personal Reflections

Michal Podgórni

"We were the only group who stayed together after first semester and, in my opinion, it was a good idea. We know to what extend we can rely on other members, we know our strengths and weaknesses and it makes our work easier. The bad thing about that it is often hard to focus on work when you know each other well and you want to talk about other things than semester project. Anyway, I think we know how to handle this issue and we did handle it well so far.

In previous semester we didn't have time for final corrections and at the end we didn't finish our project because of Waterfall approach. This semester we used SCRUM and right now I am certain I see a difference between those two tools. Even though I think SCRUM is meant to be used with big projects in my opinion it worked really well and it could have been even better if the timeline was good.

I can say that lack of experience was the main reason why we were struggling with creating our system and documenting it. On our way we have encountered many problems we did not expect and we were not prepared to solve them. Nevertheless, I believe this is not a bad thing, it is how you learn and gain experience, by solving issues you have not encountered before.

The main learning from this semester (except the technical knowledge) is that setting right expectations is very important thing and spending many hours on planning at the beginning usually allows to save plenty of time at the end. It is also very good idea to plan more than you are able to create, because at the end you come to conclusion that some of the things are not necessary and you can see the core of you project. Also, I would like to mention that working with people from various environments is very interesting for me and it surprises me all the time how absorbing it may be, seeing or hearing other people's points of view. Working in a team is certainly a skill everyone can possess, it just takes some time and effort."

Dragoș Sîrbu

"This Semester Project Work has been my second serious group project until now. Following the same pattern as in the first semester, the early thing we did as a team was creating and signing a group contract, which contains general rules regarding the attitude we should have towards work and the other members.

I can affirm that I felt responsible from the beginning for the possible outcomes of the project and I tried all the time to finish my assignments and present them to the rest of the team in the most understandable way. I think that the group contract played an important role in increasing the overall motivation of the team to succeed. Also, even if I wasn't assigned one of the SCRUM's roles, SCRUM Master or Product Owner, I felt responsible for completing my parts of the work even as a simple team member.

When it comes to the international environment, some people may say that things can get a bit problematic when cooperating with people who have been grown up in different countries and are part of other cultures. Nevertheless, the fact that not all of us belong to the same nationality, doesn't really mean something for us, especially because we all come from European countries, so that there are not many culture differences.

In conclusion, except for the new way of organizing the work, the fact that we already knew each other can be accounted as very helpful, as we already knew where we could use someone's skills best. This semester everybody was prepared way better and appreciated what we can expect from the future. Except for minor disagreements, that are solved without any difficulties, we agree on the most important parts and can work together well."

Michał Jurewicz

"Due to the fact that our group has not changed after the first semester, first I thought that there will not be much more to write about my personal reflections on how we worked and what I think about my group. Therefore, I wanted to use my part, or at least most of it, from the previous process report. But after reviewing it I realized that I
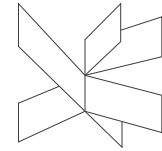
am not quite right and not everything is the same. To be more specific – most things changed.

To begin with, I did not change my opinion on the other group members and I consider us a good team in general. I feel satisfied with what we have achieved and think that the other group members can say the same.

Every of us tried to do their best in order to perform our duties and I am sure that we were all dedicated to this case. However, we are still beginners in our field and many things that come up suddenly are a bit surprising so that we did not always know what we should do then. That is why we have not achieved everything we wanted but what we have now covers the most of our expectations.

The part that tells the current project from the first one the most is, obviously, way of working. In the first semester we used the waterfall approach, while now the method was the unified process. In my opinion this time, even though we did not know how to use it one hundred percent properly at the beginning, in the end everything was a lot more under our control, compared to our first experience of making a group project. By this I mean that at every essential point of developing our system we could make most changes we wanted without sitting many hours and reediting hundreds of lines of code. That is a thing which can decide whether we achieve our goal or not.

Further, after over half a year, our knowledge was noticeable bigger than at the beginning and we also had something to base on. Thanks to learning many design patterns and seeing sample parts of different systems, we could apply them in our own project and reach what we needed in the simple way instead of doing everything all around. It also worked on the other way around, because when we could not really understand how something works, trying to implement it helped to get to know the idea and cleared up a lot for all of us. Thanks to a lot of practice, patience and effort, we managed to achieve what we set for ourselves and the result is something that we are not ashamed of."

Cristina Ailoaei

"Right after semester start and group formation, our team decided to create the basis for a group contract which promotes support between members and dedication to
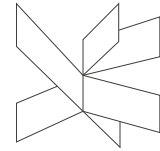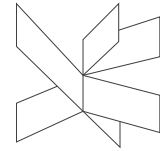
the scope among the most important things. Every group contract is specific in its on way and can actually reflect not only the needs of a group, but also the aspirations and preferences of the members. We value equality in our team more than anything, equality both in sharing the work/responsibilities and the results. So, there is no place for blaming or pressuring the others. Of course, we were individually responsible inside the group for our own actions and duties, but from outside the group we are all responsible for the course our project was following. Acknowledging that you also have some part of guilt in someone else's misbehaviour because you were insufficiently involved is one of the things I am proud our team realized.

Even if we have collaborated as partners before in a project semester, the experience gained this time was really authentic. As new planning methods were introduced and we had to discover and try them together, new unexpected situations have been encountered. Two members of the group had to play an extra role besides the team member role, which offered them new attributions. I truly believe that the new planning methods made us feel closer to the real business problems and shaped us to take the project very seriously. I think that everyone worked hard and was enough motivated to finish the work.

I discovered something new about me. If in the beginning I was a person who did the best work home or in a quiet place, now I learned to work at my full potential right near my teammates. Sharing knowledge with each others and spending a lot of time together made me to realize how important team work is and how you can use it to improve your skills also.

We can say our work was overall successful, but we miss an important part of our project because of bad planning. I think all of us now understand better the importance of making good plans. An earlier start of the problematic requirement would have saved us, in my opinion.

Taking everything into consideration, I can conclude that the most valuable thing we achieved was growing as a team, being there one for each other, gaining experience together and <<trading>> knowledge."
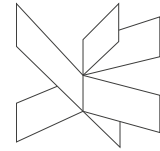
7   Supervision

No part of the project could be done without proper knowledge. Therefore, it is obvious that the information needed in order to develop and document the system came from the supervisors.

During the actual classes in the semester and extra meetings with the supervisors we have received the attention and support for learning all that was necessary in order to complete our works. Also, valuable feedback has been provided to us in the scope of understanding our mistakes and finding a way to correct them.

We are very content with the cooperation we had with the supervisors, as they showed commitment and took our problems very seriously, even if most of the time we tried to do the project work on our own and so to learn by self-discovering. Also, through self and peer assess, we tried to be more actively involved in the process and to improve our independence and motivation. But, when we needed external help, we knew our teachers are one email or a door away.

Each member of our team can honestly say that the guidance we received contributed a lot to the final result of the project.

8   Conclusions

The good cooperation of the team has been influenced mostly by the fact that the members had the chance to work together before. Everybody knew exactly what to expect from the others, what are their weaknesses and strengths and how can the team benefit from them. Although there have been minor conflicts inside the team regarding the best decisions to be taken, they were being solved relatively fast, mostly because everybody was aware of the fact we were working to achieve a common goal. All in all, we are content with the group work we managed to organize and can honestly affirm that we felt good in each other's company.
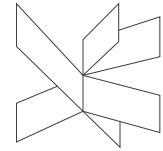
The situation we confronted with this semester was very different from the one in the first semester, because of the new approach of working and the bigger challenge to fulfill the tasks. We learnt a lot of new things from the process and therefore can recommend some things to do and not to do as a team:

Do: stay positive in all situations, be open-minded, respect others, listen and pay attention to your group, ask for help when needed, don't be afraid to express your opinion;

Don't: blame other teammates, be aggressive toward the group, try to put the other members under pressure, ignore others, dominate the discussions.

We can conclude that for each of us, the work group has been a remarkable experience from which we had the possibility to gain a lot of knowledge and skills to be used in the future projects.

Appendices