**Process Report Group 3-Z**

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**Software Engineering**

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# Introduction

This group for the 2nd semester project is formed by 5 individuals: Rosa Briales, Franciszek Jan Nurkiewicz, Maria Ortiz and Alexandru Dulghier, officially created the 23/02/2022, when the group contract was signed (see Apeendix P).

We worked following the SCRUM methodology (Shead, 2020) and unified process (UP) (https://www.geeksforgeeks.org/, 2020), we initially had 2 weeks long sprint with the supervisor present during the sprint meetings and tried to have daily meetings in person every time it was possible, otherwise, we opted for a virtual one by using discord or WhatsApp.

During the project period, we instead opted for 5 days long sprints, we would meet a VIA every day excluding the weekend, have a daily meeting, and proceed to work on the project for the next 7 hours.

Our last sprint ended on 23/05/2022 we opted to use the next 2 days to polish the software and officially finished implementation on 25/05/2022.

The remaining days until the deadline (02/06/2022) were used for the elaboration of the process and the project report.

# Group description

Since the first time we heard about the personal profiles, we have been told that a group where all the members have a strong red personality would most likely fail or face a lot of problems in the way. At that time, we laughed about it. The profiles only make it easier to understand what we already knew from last semester: that, indeed, we were going to have a lot of problems and conflicts, but we could make our group work despite our personalities, or maybe precisely because of them.

To understand our group dynamic is important to look at each of our personalities individually first.

Starting with Alex, he is the only one who was not in this group last semester, which means that we had no previous experience with how he works. Because of that, his profile might have been the most useful for us as a group, because it gives us a general idea of how he is as a person instead of starting from scratch. He is the only one in the group with almost no red personality, which sometimes makes it difficult for him to deal with the rest of us. His predominant blue type is what made us choose him as a scrum master, but as the project evolved, he came to the realization that he is, after all, green and yellow above blue, despite what the test might say. Along the weeks that we were working together, he tried all the time to make sure we had a good working environment, and everyone felt comfortable, even when the conflict arose. We soon got used to his jokes and comments, and they have been key to keeping us relaxed and in a good mood.

When Franek received his results, everyone was surprised about them except for himself. When we are working together, he doesn’t show a red personality, but, as he says, it might be because being among others with strong red personalities makes him adapt and show other parts of himself. The truth is that during the project we have seen him more as a blue or even yellow person, and the red traits only show from time to time, when he is stuck in a problem with the implementation, and this is probably one of the reasons we have not to face even more conflicts, always when he is working on his own and never when discussing something with the rest of the group. The blue personality also made him fit for the scrum master role, but we finally decided on Alex, and he took the product owner role instead. Overall, Franek is the most equilibrated person in the group by far; because he doesn’t lack any colour, he is able to adapt to the situation and act depending on what is best for that specific moment.

Opposed to this equilibrium, Rafa is quite the opposite. He has a strong red personality, and it shows almost all the time. When it comes to the project, this means that he is involved in almost all the conflicts and discussions. Something that might be important to highlight, is that ever since he got his results, he has been convinced that they are wrong, and he should have more blue. Every time this topic comes up, we kind of repeat the same conversation. In the group, we all agree that he is red, and all of the blue that he may have is mostly covered by the red, which doesn’t mean that he doesn’t have a blue personality, just that is hidden. In this project, however, he has been able to show it above the red, at least when it was important or relevant, like at the times of decision making or at the sprint meetings. We have all as a group beneficiated from his support while organizing tasks, especially Alex, who was, as the scrum master, in charge of managing them.

María’s profile shows that she has both red and yellow as her predominant colours. She is very organized despite having almost no blue personality (or perhaps because of that) and always keeps lists of everything: things to do, questions for the teachers, what is working or not working on the project… The combination of red and lack of green means that sometimes she might be too harsh when saying something to the other group members, luckily, we know that she means well and is just her way of expressing things. As previously stated, her principal colours are yellow and red. Most of the time she is yellow (so yellow that everyone can see it) so she contributes to keeping everyone in a good mood and is nice to work with her. However, during the project and especially in meetings, is the red part the one that shows the most, so she also gets involved in most of the discussions.

Lastly, Rosa’s principal colour is red, but she has green and yellow as well. Among all the members, she is the one with less blue (almost nothing). In contrast to María, who compensates for her lack of blue by trying extra hard to be organized and tidy, Rosa is probably the less organized of all the members, and is not uncommon that she leaves things halfway done if a task takes too long. However, she knows that this is one of her weaknesses (she knew before getting her profile, but it also helped her to understand it) so she is working on it and always comes back to make sure all her tasks are finished. Along with the project, we have come to realize that this also has a good side: she is able to work faster without affecting the quality of her work. After Rafa, she is the one with a stronger red personality, but having as well a lot of green and yellow, she doesn’t fight with everyone in the group, only with Rafa. They started the project fighting and discussing a lot, and they were able to calm down progressively, which doesn’t mean that by the end of the project they didn’t fight with each other (with their personality, that is probably not even possible) but the discussions were a lot less often than they were at the beginning of the semester.

In general, our group is not really equilibrated, we are probably missing someone with a strong blue personality and 4 of us have a strong red personality so, looking at it theoretically, the group has all the characteristics to be a failure however, somehow, we have got time to know and understand each other and our personalities and we have made our group work despite everything.

Chart

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Figure 1. Maria personality chart

Chart, radar chart

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Figure 2. Alexandru personality chart

Chart, radar chart

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Figure 3. Franciszek personality chart

Chart

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Figure 4. Rafael personality chart

A picture containing text, device, fan, tower

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Figure 5. Rosa personality chart

Three different home countries can also mean three different cultural backgrounds, however, Italy and Spain are similar when it comes to the culture which means that four of our five members should stand close on the scale for most of the aspects, but when, as a group, we took the Erin Meyer test of the culture map (Meyer, 2014), we found some interesting results after comparing our score with the ones of our own cultures. In the following figures, is it possible to appreciate said results in three of the eight aspects. (Figures 6,7 and 8)

## Evaluating

It might be the most relevant dimension to our group, given that we are required to evaluate each other’s work constantly while working on the project.

The three countries tend to the left side of the scale (direct negative feedback) while the group position tends to the right (indirect negative feedback). While the difference between them might not seem big at first sight, we have checked multiple times during the project that it can easily develop into conflicts if we are not careful. Therefore, we have, as a group, learned to accept that comments about our work are not meant to be as harsh as they sound.

A picture containing timeline

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Figure 6. Culture chart negative feedback (Meyer, 2014)

## Trusting

When it comes to trust, our group is divided into two different groups, not according to our culture but to ourselves as individuals.

On the one hand, we have half of the group which follows what the scale shows, trusting more in the people if they have a relationship with them, which means that getting to know each other and becoming friends have a positive impact on the final product of the project. On the other hand, we have the other half of the group which doesn’t trust anyone, no matter the level of relationship they have, meaning that they face difficulties when it comes to delegating the work and want to control everything, supervising and revising the work of everyone to make sure is well done according to them.

This issue has been addressed as a group several times and as we proceed with the project period there were instances where the group member were more trusting regarding the tasks but overall we still had a strong tendency for control.

Shape

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Figure 7. Culture chart trusting (Meyer, 2014)

## Persuading

The last of the aspects we found relevant to include is persuading because it really influences how we make decisions as a team.

All our countries have the ‘principle first’ culture (in the case of Spain and Italy is extreme) and, somehow, the group altogether can find itself on the ‘application-first’ side. In our countries, we are used to hearing a lot of data when someone is trying to convince us about some matter, we would listen to all the meticulously recollected information before they even explain what their position is. This situation contrasts with how we work as a group. Even though we appreciate the objective information, and it can be useful while making decisions, when we are trying to make a point or let others know our opinion, the first thing we do is say it, and later we’ll list the arguments to support it. This approach has worked well for us, and we found that it saves time in most cases. Is interesting how we have adapted ourselves and ended up with a position similar to the Danish one, which is represented by the yellow triangle in the scale below (figure 8)

A picture containing diagram

Description automatically generated

Figure 8. Culture chart persuading (Meyer, 2014)

In general, once we correctly understood our cultural differences and how they might affect our behaviour in the group, they suppose a great advantage while working together rather than a conflict inducer.

# Project Initiation

Even before receiving the specifics of the project and it’s requirements we already had an idea of group composition, since we achieved good results previously, we decided to proceed with the same team as the previous semester with a new addition.

We were already familiar with each other even with Alexandru who was the new addition since we had some interaction with him in the previous months.

For this project there was no topic, we were told that we needed to decide ourselves instead. We were given specifics of what the system should have e.g (persistence, client/server etc)

Said specifics reflected the knowledge we were supposed to acquire from the various courses of this semester and implement them in a system.

Since we had to decide the topic ourselves, we weighted different options and, in the end, decide to proceed with a library system since we were all familiar with how a standard library works and it could be said that we all had some degree of knowledge of its domain which would ease the following steps in the project such as the description, analysis and consequent conceptualization of the system.

Before proceeding forward, we stipulated a contract binding the group members to follow its regulations such as the language spoken, which would be English; handling violations of the stated schedule, and more. (See appendix P)

After we received approval for the project topic from our supervisor, we proceeded with the project description.

# Project Description

We started with the project description, which was a group effort since we all worked together, we would meet each other and proceed with every step of the project description.

For the Background description, we had to come up with a realistic scenario to describe. Every member of the group would come up with suggestions, be it either the layout of a phrase, actual additions, or deletions, some of these changes would be implemented only after lengthy discussions within the group.

Considering the importance of the background description it was by far the most time-consuming part of the project description. The following steps were straightforward since they were derived from it.

For the methodology, since we had to follow SCRUM and UP we needed to assign the roles of Scrum master and product owner. Initially, we opted for Maria as scrum master because she already had some of the tendencies of one, that we observed in the previous project. For the product owner, we decided we all would take the role simultaneously. However, after receiving some feedback from Mona who was in charge of teaching us about the personality charts and differences in the culture in the work environment, we decided to rethink our decisions and set Franciszek as the product owner and Alexandru as the Scrum master.

Finally, we created a schedule for the following weeks until the deadline where we highlighted the most important milestones that we would follow.

Before proceeding further, we asked for feedback from our supervisor on the overall project description and some unclear details. The meeting was fruitful, we managed to clear our doubts and we were confident in proceeding further having a solid foundation for the next step.

# Project Execution

In the inception phase of UP (it started with the project description), we worked together to find and write down all the user stories that our system was set to satisfy, in a single meeting, then we ordered them by importance and divided them into categories such as: critical, high, low we also defined all the non-functional requirement for our system.

According to the Unified process, during elaboration, we found more requirements as we proceed with the sprints (Scrum).

We tried to follow the SMART (T.Doran, 1981) principles when defining our requirements

With requirements set we could now proceed with our first sprint after choosing two of our user stories from the critical ones, with AGILE (Kent Beck, n.d.) principles in mind, we created the tasks that will allow us to deliver software to showcase to our product owner at the end of the sprint.

One of the tasks was the creation of the domain model, following SCRUM we should’ve created the domain model only for the entities from the user stories selected for the sprint, but we decided it would help us to have a complete domain model for the entirety of the requirements.

We then proceeded to estimate the time for the tasks and listed them on ASANA website where we created a project so we could organize ourselves with the processing of the tasks, we also stated that some tasks were necessary to be completed before taking other e.g. class diagram needs to be done before starting implementation or analysis tasks before design.

We initially had some problems with the ASANA tool regarding the division of the tasks in subtask that we solved by agreeing on a unified vision.

The start of the first sprint was officially set on 29 of March this was the end of our Inception phase proceed with the elaboration phase of the project.

For the first iteration of the design part, we tried to follow the SOLID (C.MArtin, 2000) principles focusing especially on the single responsibility one and the Interface segregation principle (see class diagram, appendix G).

As time passed the first sprint come to an end and it was time to showcase our software to the product owner, our supervisor was also present during the presentation, unfortunately, the presentation was a failure from the technical point of view because the day before we had a refactor in our software which caused it to malfunction, so we got our first lesson “don’t refactor a day before the presentation”, we still had the artifacts for analysis and design but we couldn’t say that we fulfilled the user stories for that sprint.

Figure 9. Burn down chart sprint 1

For the retrospective of that sprint other than the refactor problem, that we stated that it shouldn’t happen again, we also noticed that we overestimated our ability to complete a task in a certain amount of time, so we decided to be more generous when deciding a time for the future tasks.

Following scrum, we put the not completed tasks in the backlog and proceeded to select new user stories to implement. We decided to carry the icomplted tasks over to the next sprint and take 2 additional user stories hoping to not commit the same mistakes as sprint 1.

The 2nd  iteration of analysis and design went smoothly but when it came to implementation we found ourselves a new challenge **Git Hub** none of us were familiar with it so we ended up deleting each other code, or we would refactor some parts of the code that would work for one but would brick the code for the rest.

When the presentation day arrived we still had not fulfilled any user stories, but the supervisor which was present pointed us to some useful learning material regarding GitHub.

For our sprint retrospective, we laid out new rules using Github:

-Make a new branch for every new sprint

-Don’t commit if the code doesn’t at least compile

-Pull before pushing changes

-In case of conflict discuss with the team before

We also decided that some tasks like Junit should be divided further into smaller tasks since it was huge and people were reluctant to take it.

Figure 10. Burn down chart sprint 2

The 3rd Sprint was an odd one

Figure 11. Burn down chart sprint 3

It happened during the period of the last SDJ 2assingment so no one had time to work on the project until the last 2 days, in those 2 days we took the old tasks form the old sprints and completed them so when it was time for the presentation again we finally could say that our software fulfilled the user stories form the 1 sprint and partially the ones for the 2nd sprint (software worked as intended needed some testing)

So, at this point 11, May 2022 user stories:1,2,5,6 were fulfilled, the Elaboration phase came to an end and we could proceed with the construction phase.

For this sprint retrospective, we observed that GitHub usage was improving but needed to be a little better and we needed to have more daily meetings.

Sprint 4 was only 3 days it was composed of the task we left from sprint 3 since we decided to take the requirement again, it also corresponded with the project work period we started to meet in the morning have the daily meeting, and work on the same room to different task, it was by far the smoothest sprint till that day, this was largely because we were able to communicate instantly, but also because we acquired a certain amount of experience form our failures.

User Story:3, 20 were fulfilled at the end of the sprint

For the retrospective, we noted that our efficiency was very high this sprint this was due to the fact that we were working together in the same room, and we got hang of GitHub so we decided to proceed this way for the next sprints.

We discussed our plans for the future at the end of sprint 3, deciding that we would put an end to implementation on the 25 of May so we could have time to concentrate on documentation and we would finish the sprints on the 23 of May so we get 2 days to polish the software.

Figure 12. Burn down chart sprint 4

The next 2 sprints were the most challenging in terms of complexity of the implementation but we encountered no major hiccups and the minor ones were solved before the sprint meeting this is thanks to the experience we acquired during the project period and the rules we came up during our retrospective, there were no major reflections during the retrospective for these two sprints in fact for the last sprint meeting retrospective the log has only one line “good sprint”.

We managed to fulfill the user stories set at the start of the sprint and showcase the result to the product owner.

Figure 13. Burn down chart sprint 5

Figure 14. Burn down chart sprint 6

So with the construction phase of the project, we used 2 days focusing on polishing and the remaining tests.

The testing iteration for every sprint was somehow difficult to execute and it was frequent to have questions on this topic for our supervisor, we tried to follow the Z.O.M.B.I.E.S methodology when possible, and we tested the model layer with little to no problems but when it came to other layers we had to create fake classes so the classes interested could be tested, this added a considerable amount of workload every sprint, adding the fact that it wasn’t a very engaging activity, it was very challenging for the team to complete these tasks.

At the time we decided to finish implementation we had 8 user stories of 21 fulfilled it’s not the grand system we envisioned by all the critical user stories were implemented.

Figure 15. Sum of the burn down charts

For more detailed information regarding sprints check the backlog from the Appendices O.

# Personal Reflections

# Supervision

We relied heavily on our supervisor both for concerns of how to proceed with our concepts and how to solve the problem we were facing, in every case they managed to either point us in the right direction on outright tell us how to solve the problem, they were also present during the first 2 sprint meeting giving us helpful feedback.

Other than that we had 7 other meetings with Ole 4 in person and 2 in zoom for the duration of about 30 min we also had 2 meetings with Ib for the duration of 40 min

After every meeting, we would be able to get some benefits for our project that would help us move forward.

# Conclusions

With 8 of the 21 user stories fulfilled the software is a far stretch from the one, we envisioned initially, other than the lack of practice with some tools we used we also had to overcome the challenge of working together as a group and adapting to the new methodology.

But as the time passed, we gained more grounding and we manage to improve our workflow, things that seemed useless and a waste of time at first turned out to be essential fuel for our improvement.

Even when things were clunky on the implementation side we still tried to follow the principles learned in class “SOLID” (C.MArtin, 2000) for the design and analysis, this allowed for greater clarity when proceeding forward and with the separation of concerns we could fix any problem that came up without affecting the entire system.

Another thing worth mentioning is the fact the burndown charts don’t reflect the number of actual hours we spend on this project during the sprint time, the actual amount is probably 3 to 4 times the number of hours that is represented, this was caused by an overestimation of our abilities to complete a task or simply doesn’t count the amount of time spent on research tools that will allow us to complete new tasks or other tasks that we didn’t think to add to the tasks list at that time.

And to conclude, we are sure that if we got the chance to start again this project or one with similar requirements at this point in time, we could deliver a lot more artifacts in the same amount of time due our knowledge acquired.

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# Appendices

Appendix P: /Appendices/Group\_Contract

Appendix O: /Appendices/backLog