SEM5640: Individual Report

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Personal Evaluation

From a technical perspective, my contribution to the group project was primarily centred around developing the front end of both the .NET and JavaEE versions of the project. Specifically, most of the tasks that were assigned to me where focused on activity data. This includes both the management of activity data, displaying the data to the user, and displaying data between users (especially leaderboards).

Apart from creation of the database architecture for each of the projects and the corresponding entity models, I was responsible for almost all of the direct interactions with activity data. This meant I was responsible for the creating the views/JSPs, view models, and JavaScript. I was the first team member to directly touch the scaffolded front end (followed closely by User management produced by Connor). Subsequently a lot of the specific interface design choices in this area were made by me and this led to certain patterns being adopted (for better or worse) by others elsewhere.

I feel that I made a good contribution to the project, but I also obviously believe that there are several areas in which I could have improved my performance in hindsight. The remainder of this section will discuss the strengths and weaknesses of my contribution, provide justification for my actions, and suggesting how I could improve in the future.

At the beginning of the project, I tried to encourage my fellow team members to set times which were suitable for project meetings as soon as possible. This was not difficult as the other members of the team were all of the same mind, but I felt it was important we try to push on with requirements analysis and produce a general sketch of the system early to give plenty of development time later. In those first few meetings I also tried to ensure that the team members stayed on track during discussion while trying to make sure we covered everything. This included things such as working through the requirements one by one rather than jumping around and going off on tangents.

I feel that this was a useful contribution to the early stages of the project. I would not say that I was overly "bossy" and I feel that other team members were pushing for the same thing. I was careful to give nudges to the conversation to keep it on track but not try and squash enthusiasm. Looking back, I believe this did help to keep those meetings shorter and more focussed.

In the midst of the development process I was also keen to push for a clean wrap up of the project at the end of each sprint in order to make sure we could keep to the planned time allocation. I felt it was important to try and ensure we would start the next sprint with a clean, correctly building, master version of each project. This gave us a weekly checkpoint where we knew things worked and also allowed us to bring our work together. I knew that this would be an easy area to let slip so I was regularly vocal in insisting that we finish up at then end of the week. We overran a couple of times into the morning of the following day due to integration issues.

During the initial stages of the project I felt slightly under utilised. I think that considering my relative inexperience with the technologies I could have done more to prepare myself before implementation began in this time. I did familiarise myself with Scrum based methodologies which was invaluable after the project started, but I feel that running through some additional .NET and JavaEE tutorials would have given me better insight during my first steps into development.

On area where I feel I was a strong contributor was version control. Other team members had varying

degrees of competency with Git and I think it would be fair to say that I had the strongest experience. Throughout the course of the project I helped my team mates out of countless issues when switching between branches or fixing merge conflicts. I also played a large role in trying to ensure that that team members stuck to the group workflow, e.g. by not including changes for multiple issues on the same branch. I also found myself frequently giving advice on what was the "best thing" to do under certain circumstances (e.g. "should x be done on a new branch?").

I think that towards the middle of the project, in contrast to the first few weeks of I became over committed to work. In the weeks following the first couple of iterations my assigned workload was well above what should have been my maximum for that week. I do not feel that I was exceptionally overcommitted as the other team members also had stretch workloads.

However, I do think that this led to a slip in the quality of the work I produced. I almost always felt like there was not enough time in the day to complete my assigned work. I believe this meant I would be more likely to take a shortcut and less likely to spend time reading around and finding the most optimal solution to the problem at hand. This effect was also compounded by my immature knowledge of both frameworks. I often got stuck in a rut over a simple problem which wasted hours (and occasionally days) of allocated time.

Another area where I feel I could have been more proactive was in helping to test and integrate the system. In our project piece of work needed to be manually reviewed by another person in order to check that what they had written actually worked. While I was very proactive at testing towards the end of the sprint, I often put off helping out midweek due to focussing on my own work load. This is actually like shooting yourself in the foot because it means more reviewing to be done at the end of the week and subsequently more end of sprint headaches.

While I feel my overcommitment was an issue, I struggle to suggest a cure in hindsight. The obvious solution would have been to spread the workload more evenly amongst my colleagues. However, as mentioned above, they had workloads that often equalled or exceeded mine. Pushing the work forward into the next iteration (which commonly happened) only made more work inevitable in future weeks due to our fixed time schedule.

Another issue I feel affected my performance was the technical difficulties I had. Owning a Macbook computer with only a relatively small hard drive meant I had to run a Windows Virtual Machine on an external HDD in order to develop for the Visual Studio application. This was both slow and prone to crashing. In hindsight I could have tried harder to find better access to a Windows machine or pushed for the Windows project to be developed by team mates who develop natively on Windows.

Group Evaluation

Generally speaking I felt that the group worked well together throughout the course of the project. In my own opinion, nearly all of the problems that we faced throughout the course of development did not stem from arguments or tensions between group members. I found that while some conflict is inevitable in a group project this was handled quite maturely and did not cause any major issues (this is in sharp contrast to the majority of cases for the 2nd year group project).

I think our choice of development methodology was a good one, although I feel that our execution of the methodology could of been better. I am of the firm opinion that if we had chosen to follow a methodology at the other end of the spectrum we would not have achieved as much as we did. As it happens, using Scrum allowed us prioritise tasks by how much value they had to the customer. This proved to be very important because as we ran out of time we could shed less critical features. For example, we dropped email support, which while desirable, did not mean we had a non-functioning system.

Another strength that came from using the methodology we chose was that I felt we were able to adapt over the course of the project. Leaving a large part of the implementation specifics to individuals meant each developer could adapt how they implemented their work accordingly. While the requirements of the

project were unlikely to change much, this point made a difference because we were unfamiliar with the technologies we were working with.

This was also important because we were working with two distinct technologies. Different implementation dependant approaches were needed for each technology. I hypothesise that designing the whole of both systems up front without fully understanding the intricacies of the technology we were working with would have resulted in a worse result.

However, I would also like to counter this point with the fact that I believe we could have done with more initial design and/or prototyping to better understand some of the challenges we faced. I think that there is a critical balance that needs to be struck with starting a project (especially a short, time constrained project such as this) between too much and too little design initial. I also think this is highly dependant on both the team's skills and the problem domain. In this project I felt that we got that balance wrong in the direction of too little design.

In hindsight, I think that some perhaps some early prototyping of some parts of the system could have saved us some time later in the project. I think this could have reduced some of the pain we experienced in areas such as the Jawbone API where we struggled to get a solution working and ran allocated time. We could have had a chance to experiment with the technology ahead of time and it might have given us some artefacts we could work from.

I believe that the issue with not performing enough design or prototyping up front stems from a large issue that we experienced as a group. I think that a core issue we had towards the start of the project was our genuine inexperience with starting an agile project. While all of the team members had some experience with an agile methodology, none of us had any experience managing the start of a project. In all of our previous experience we had simply been dropped into established groups and projects where everything was already up and running.

We found starting a Scrum project was actually quite challenging. As I have already mentioned it is difficult to judge how much design work should be undertaken before development begins. An agile approach shouldn't do too much or it defeats the point of agile, but likewise there should be some initial exploration in order to make sure all team members are on the same page as well as working out the hard aspects we don't fully understand.

But there were some additional issues that we faced when starting the project such as how to initially create the product backlog items and how to initially assign these to team members. The latter point is worth underlining as I think it is something we had particular difficulty with early on. I think we found the initial sprint assignment hard because many different tasks are dependant on each other. For example, many of the tasks were dependant on the creation of the database which made it difficult for everyone to try and being work at the same time. In the first sprint we often found ourselves waiting on the work of other people.

I do not think there is a simple solution to this problem, but I have a suggestion in hindsight. Linking in with my suggestion of doing more prototyping, perhaps we could of had someone experiment with setting up a database and a basic project scaffold before the initial sprint. The prototype artefact could of then been used in the first sprint instead. But perhaps this is slightly circular as all you've really done is move initial setup outside of the first sprint. However perhaps this could have been a way to better utilise the time in the early part of the project. This also suggests that we may have needed to have made a better distinction between what goes into the initial sprint and what to prioritise.

This leads into my next point which is that I strongly felt we needed to spend more time setting up the project to make our workflow more stream lined. While this would have sacrificed more time at the start of the project, I feel that the savings generated later on would of outweighed the initial cost. This includes things such as correctly setting up the git repositories to sensibly ignore some configuration files and not others. In both projects we had issues where the Git would include configuration files that would often get modified when people committed changes leading to conflicts that were not easy to resolve.

For example the Netbeans project included a configuration file listing how third party JARs were linked to the project. Depending on how the the had been linked this could lead to them being missing or broken

in the repository. Issues such as these should have been addressed much earlier in the project.

The solution to issues like this would have been twofold. Firstly, we could have better defined the conventions used by the team. In the previous example this could be solved by adding the JAR dependancy as a relative path from within the netbeans project, rather than an absolute path to a specific place on a specific machine. Alternatively an even better solution to that specific problem might have been to setup a dependancy manager such as Maven. Secondly we could have used more automation to avoid repeated mistakes where possible. One obvious example of where automation could have been used better within the project was testing which I will discuss in detail next. Another place ripe for automation was the Git workflow. Common operations such as creating a new branch and merging work could have used some custom scripts to ensure common "gotchas" (e.g. not cleaning out the database old migration files) were avoided.

I feel that the only reason why automated solutions such as this were not implemented in our project was that we simple didn't have the time to write them. We had to pour so much time into completing the work we had that there was ironically no time to setup or write automated tools after we started development. Better conventions and automation should have been setup much earlier in the project and I think we didn't realise this until it was too late.

This brings me nicely into the discussion on testing and integration. Our project possibly suffered the most from the lack of automated testing on the system. I feel that this problem stemmed from a combination of three issues. The first is that we did not set up an automated build system anywhere fast enough. Secondly tests were not written early on because people were under pressure to complete features quickly and so often let this slip. Thirdly the nature of the project meant that it was often difficult to create unit tests for code, especially in the early stages where much of the code was scaffolded. This meant that we were effectively flying blind during the week until a piece of work got reviewed.

Each one of those points taken on their own would be a challenge, but the combination of the three lead to more headaches than I care to mention. I think the solution to these issues would be twofold. Initially we should have setup proper testing environments on the build servers and we should have written very basic tests for the skeleton code generated by the scaffolding. Secondly we should have had a stricter acceptance policy that required tests to be written before the would be accepted as done. In reference to the first point I believe the scaffolded code should have been tested so that the developer would be forced to change update the test when something was rewritten. Regarding the second point I feel that this would be the ideal solution, but that in practice this wasn't done due to the fact that some tasks were dependant on the work of others and time was against us.

One aspect which I feel did work well was the reviewing of the features before they became fully integrated into the project. While it is painfully obvious that this needed to be supplemented by a better automated testing and integration strategy it did seem to work fairly well. Due to time constraints and the logical constraints of getting people into the same room I feel that the general consensus was that it would have been impractical to have a full team wide code review for every feature. We settled with requiring two developers inspecting a feature for quality assurance before it was approved. This was later dropped to one due to time pressure. I feel that this system worked well because it provided a balance between providing quality assurance responsibility distributed over the group and the practicalities of having the workload, time and logistical constraints we were facing.