Senior Project Final Self-Assessment

This document is intended as a guide for the senior project team to assess its performance in a number of dimensions. Add additional items that you feel are appropriate.

This self-assessment will be one of multiple elements that your faculty coach uses to arrive at an assessment of the team's performance for this second term. The other elements that the faculty coach will use include: direct observation of the team, team peer evaluations, reviews by other faculty during the project presentation, sponsor evaluation, and project deliverables. These self-assessments will also be used as part of the SE program's accreditation and curriculum improvement efforts.

To complete this self-assessment the team should carefully consider each of the questions and provide an honest evaluation of the team's performance. Your faculty coach will inform you when this self-assessment is due and how to deliver it.

Team: Team Kwondo

Project: Tioga Tae Kwon Do Student Management System

Sponsor: Paul Mittan

Product

1. **Did the team prepare all the documentation artifacts requested by your faculty coach and sponsor? Were these documents carefully inspected prior to delivery? How would you assess the quality of the document artifacts?**

   Yes, the team did prepare all of the documentation requested, and in a timely manner. Each document was carefully inspected one meeting before it was shared with the sponsor or the faculty coach. To assess the quality of the documents we reviewed the purpose and requirements of the document and then reached a group consensus that all of the criteria were met for the document.

2. **How well did the team elicit the requirements? What approaches were used to elicit the requirements? Were key requirements missed? What methodology was used to document and validate the project requirements?**

   Overall, the team did a good job of eliciting the requirements. We had a few iterations where our metric to track requirement issues, "requirement defects" spiked, but most of them were minor. During the life of the project none of the missed requirements had a

significant impact on the project. No key requirements were missed, and the ones that were missed were easily worked into the system. All of our requirements documentation were kept in a google drive document. We also used Github Issues to assist the team in planning and tracking around requirements. Requirements validation was predominantly manual, but we did have some automated tests that covered the key requirements of the system. A big part of the team's requirements validation was releasing to the sponsor every two weeks and going over every feature that was in the release and eliciting feedback from the sponsor.

3. **Did the team explore the entire design space before arriving at a final design? Have there been many errors found in the design? Was it necessary to make major changes to any part of the design? What were the reasons for the change?**

While it is difficult to explore the entire design space, we believe we explored most of the relevant design considerations. We believe we have a stable architecture, as we never had to make any architectural design changes. The only design changes that had to be made during this project were in the database schema, and the user interface design. Changes to the database schema were made for one of two reasons, because the original schema design did not allow the system to satisfy a requirement or because an optimization was discovered. Changes to the user interface were made because our primary focus was functionality at first, and the UI wasn't finalized until mid second semester.

4. **How has the development and implementation progressed? What percentage of the product do you estimate was completed? Is the team providing the documentation within the implementation artifacts?**

The development of the system progressed very well and at the time of release all of the core functionality was complete, along with numerous nice to have features. Based the requirements the sponsor has given, the product is 100% complete. The team lacked a little on documentation for most of the project, but had a strong focus on user documentation for the sponsor for our first official release. Since then the team has been focusing on improving our documentation for the final hand off.

5. **What was the team's testing strategy? Did the team develop a test plan? If so, was it followed? Did the team performing unit testing? Did the team use any test frameworks, such as JUnit? What are the testing results? Were any major defects found during system test? If so, were they fixed? Did the team do regression testing?**

The team's testing strategy was end-to-end testing of the core system features. In addition to end-to-end testing, the team also employed manual ad-hoc testing of the same features. The team never developed a formal test plan. However we did employ the protractor testing framework to create our end-to-end tests. Other than some minor defects, testing did not find much in the way of new bugs; the majority of our bugs were discovered via manual and live user testing. Most of the purpose of testing was to also ensure that all of

our code still worked.

6. **Products need to be designed within guidelines and constraints appropriate for each project. It is also important to consider the impacts of the products that are designed. In the following categories discuss the constraints and impacts that have a bearing on your project. Note that all of these categories may not have bearing on your project but your project is probably affected by many of them in ways that you may not think of regularly.**

One social and ethical constraint we had was maintaining privacy in regards to user information within the system. This prompted us to implement authentication that hides certain information and functionality based on different levels of permissions.

A health and safety constraint we had was ensuring that emergency contact information was both available and easily accessible in the case that a student is injured and their guardian needs to be contacted.

7. **What industry or engineering standards was your project required to adhere to? Were these new standards that the team had to learn? Did your sponsor provide you support for understanding these standards? Did you have to educate your sponsor about these standards?**

Our team has set certain standards for development that we adhere to as closely as possible. All code being written must be reviewed by at least one other team member. We utilize linters to adhere to code standards, and follow a good branching pattern that ensures all code is tested before it is merged into the master and development branches.

8. **What standard software engineering practices did you follow? Did your sponsor specify any of these practices for you?**

Our team utilized an iterative development methodology. We also utilized code reviews to help ensure code quality. We partook in risk management weekly, where we would identify risks and potential mitigations to them --our sponsor valued risk identification very much. We implemented automated end to end testing as part of our development.

Process
1. **What was your process methodology? Was the process appropriate for the project? Did you follow the process or modify it as the project progressed? If you could repeat the project, what would you do differently?**

Our process methodology was Evolutionary Delivery Methodology. Following this methodology allowed us to release a working prototype to our sponsor at the end of each

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iteration. This allowed the sponsor to have visibility into the progress of the project, and to give feedback based on his experience with using the product. We followed the description of the process exactly with no modifications, except for occasionally changing the length of iterations due to school breaks, and we firmly feel that if we were to do it again we would do the exact same thing.

2. **Was there a large requirement to learn the problem domain? What approach was used to gain domain expertise? Did your sponsor provide adequately support? What forms of support did you receive?**

There was not really a large requirement for us to learn the problem domain because our problem domain was not extremely complicate. Most of our learning in relation to the problem domain was by learning how martial arts instructors who are not necessarily technically minded would think about our system. To this effect, the sponsor definitely helped out by providing his feedback at the end of every iteration. Feedback from the martial arts instructors also helped us to learn a bit about the domain.

3. **What mechanisms did the team use to track project progress? Did they give the team and sponsor adequate insight into project progress and issues? How well did the team track its project progress? How often did these artifacts get updated on the department project sites?**

The team used an iteration schedule, which tracked tasks we wanted to accomplish for all the iterations. As we completed iterations, unfinished tasks were reprioritized in the iteration schedule. Tasks targeted for the next iteration were shared with the sponsor during our meetings. In addition, we recapped any unfinished features at the end of iterations. This gave the team and sponsor a good idea of the scope of the next iteration, and if it was completing its goals. The department project site was developed with links to external resources during development, so the artifacts were updated immediately. Now that development is done, we will update the site one last time to be completely standalone and static.

4. **Did the team conduct effective meetings?**

We feel that the sponsor meetings were very effective. They were organized, and time efficient, and made sure that the team and the sponsor were both in sync with the different aspects of the project. Team only meetings could have been improved. Sometimes devolved into goofing-off, instead of productive work. Other times meetings were ended abruptly due to a lack of focus or motivation.

5. **Did the team meet all project milestones? Which milestones, if any, were missed or were met ahead of schedule? What contributed to schedule changes? What could the team have done differently to ensure that milestones were met?**

The team met all but one project milestone. The only milestone missed was Iteration 5,

which occurred during finals week of the first semester. The team had underestimated how much time was needed to prepare for the presentation, and had over-committed to development tasks. To make sure we met this milestone, we could have better estimated how long preparing for the presentation would take, and take on less development tasks at the same time.

6. **Was the team required to adopt new technologies? What were these technologies? What approach did the team use for selecting the appropriate technology for the project? Did the sponsor provide any support for learning these technologies? How well did the team ramp up on the new technologies and begin to apply them effectively?**

   For this project, the team was not required to adopt new technologies. Instead, the team used technologies with which it was already familiar to develop the TTKD Student Management System. In order to select the appropriate technologies, we looked at not only what programming languages the team members were familiar with, but also which ones could help the team meet the requirements as specified during our first meeting. Because this was built from the ground up with technologies selected by the team, our sponsor did not provide us with any support for learning the technologies. For the most part, the team was able to ramp up relatively effectively because we were already familiar with the technologies. However, those team members who had done more back-end work needed to adjust to learning our front-end stack.

7. **How well did the team maintain quality control over the project artifacts? Have all artifacts been reviewed for adherence to quality standards? What was the review process used by the team?**

   The team maintained quality control of project artifacts by keeping all artifacts in a shared online Google Drive. In this way the team was able to view a history of changes made, and to easily access all documentation in order to keep it up to date. Periodically the team reviewed and updated documentation as needed. There was no official review process used by the team. This is a potential area for improvement for the team.

8. **What was the set of metrics that the team tracked? Did the team gather these metrics on a consistent basis? What did the team learn from the review of these metrics?**

   The team is tracking hours (predicted v. actual) as individuals and as a team. We are also tracking the number of code bugs discovered in each release in addition to requirements defects that were discovered in each release. We made sure to gather these consistently, both each week and each iteration. Overall we have done a good and consistent job. Our metrics show that we have a low amount of bugs and defects. Our low bug count tells us that we spent enough time testing before each release, and that our PR review was good.

Low amounts of requirement defects show that we are thorough in gathering requirements, and we only missed a few requirements during the gathering process. We also learned that our time estimates are fairly accurate with little variations due to events that occurred during the year.

Communication and Interaction

1. **How well did the team communicate project progress to the sponsor? What regular communication did the team have with the sponsor? Did the team maintain this communication to the satisfaction of the sponsor? Were any adjustments needed in the communication over time? Were these changes initiated by the team or the sponsor?**

   The team help weekly meetings with the project sponsor using google hangouts audio and video (occasionally). The team was able to maintain this communication throughout the semester, with the exception of a few weeks where we had scheduling conflicts.

2. **Did the team need to provide technical input to the sponsor? How well did the team educate the customer in these areas? What mechanism did the team use?**

   In a few scenarios the team did provide technical input to the sponsor. In order to develop more full features, we recommended a browser switch from firefox to chrome with the intention of still supporting firefox as a secondary browser. In the end, we ended up dropping support for firefox altogether due to its constraints.

3. **Was this an effective team? What has been contributing to and detracting from the team's effectiveness? What are the team's weak points? What are the team's strong points? What changes could the team have made to make it more effective?**

   Our team was a relatively effective team. The team was able to fulfill all of the major requirements for the system. A major contributing factor to the team's success was strong coordination and a strong sense of what needed to be accomplished. However, a major detracting factor for this project was teammate motivation. Some members of the team did not always feel motivated to contribute to the project, which greatly hampered efforts to implement the system. If the project had to be completely redone, a major improvement that could be made to the team would be find a way to incentivize teammate motivation, so that every teammate would feel motivated to contribute equally.

4. **What mechanism did the team use to communicate with the faculty coach? Was communication with the coach effective? Were there any trouble spots with the faculty coach communications? What could the team or faculty coach have changed to make their communication more effective?**

   The team mostly communicated with Scott verbally during our team and sponsor meetings. Occasionally we sent emails to Scott if we wanted a faster response. Scott was

great and we had no issues.

5. **Did the team need to interact with department staff personnel, i.e., the office staff or system administration? Was this been handled in a professional manner? Were there any problems with these interactions?**

   The team rarely needed to interact with the department staff. On the rare occasion we did we handled the situation professionally. We had no problems with the interactions.

6. **Does the team have a complete website with all project artifacts stored and up-to-date on the software engineering department webserver? How often were entries on the webserver updated?**

   Yes, entries were updated near the end of each semester.

7. **How well has the team made presentations to the sponsor and faculty coach? Was the final project presentation done in a professional manner? Was the poster presentation done in a professional manner? What could have been done to improve the team's presentations?**

   The team has rehearsed all presentations with the sponsor and coach. The interim presentation was done in a professional manor. Overall, the team could stand to improve their public speaking in general, but the presentations did go well overall.

8. **Does the technical report adequately document the project and its results? Was the paper of high technical and editorial (language, style, grammar, etc.) quality? Did all teammates contribute to the paper? Did the sponsor contribute to the paper? Did the sponsor review the paper?**

   Yes, the technical report is of high quality, with an emphasis on proper editorial language and grammar. The report is the quality of reports taught to us by the SE department over the last five years. The sponsor has not reviewed the paper specifically, but he has looked over the documentation used to build the report.

Preparation and Resources

1. **Did the team possess adequate management and process skills (team building, planning, risk management, change management, process definition and tracking, etc.) to carry out the project? If not, how could the program provide better preparation?**

   The team had adequate management and process skills to complete our senior project. We could have spent more time on risk management. We felt that we were prepared

sufficiently by the program to complete our senior project.

2. **Did the team possess adequate technical skills (requirements, design, coding, testing, quality reviews, etc.) to carry out the project? If not, how could the program provide better preparation?**

   The team possessed adequate technical skills, with the exception of not all the team having experience with web frameworks and JavaScript.

3. **What technical resources (or skills, training, tools) were missing, if any, that would have helped make the senior project experience more successful?**

   Overall we felt that we were unprepared by the program to successfully develop a single web application using a modern web framework. All of the web experience our team came from co-ops, and without that we would not have been able to complete our project.

   Our team also wasn't familiar with packaging and deploying software, causing a learning curve when it came to deploying the product to our sponsor.

4. **Where the facilities adequate for you to perform your work on the project?**

   No, there was a consistent problem of getting a meeting room for longer than an hour on days where we did not have a reservation. On top of that, we were limited by the department to only have a single hour reservation per week. When we could not get a team room we were forced to be in the co-lab or even worse in the lobby and both environments had serious impacts on our productivity as compared to a team room.

Achieving Customer Satisfaction

1. **In the team's opinion did the work satisfy the project sponsor? Are there areas where you think you exceeded the sponsor's expectations? Were there any weak spots in this regard?**

   The team's opinion is that the implemented system satisfied the project sponsor. This opinion is based on the sponsor's direct input. The main area that the team would say exceeded the sponsor's expectations was with the checkin screen. During live user testing, the sponsor was thrilled to see how quickly an entire class could check themselves in. In terms of weak spots, the sponsor was definitely somewhat disappointed to hear that we wouldn't implement Google Calendar integration, which he was thrilled to hear about at first.

Achieving Team Satisfaction

1. **Did the project satisfy the team's expectations for learning? What could the team have done differently to improve the team's learning experience? What could the**

faculty coach and department have done differently to improve the team's learning experience?

The project did satisfy the team's expectations. The team could have benefitted from doing more tutorials on the chosen frameworks before doing development. We could have stuck to a consistent style guide which would have made it easier to identify what code is doing. The faculty coach was superb in helping us learn.

One Piece of Advice

1. **What one piece, or more, of advice would you give to future senior project teams to help them be successful?**

- Release early and often
- Work **at least** 8 hours a week
- Nail down requirements early
- Choose a methodology that you will actually stick to
- Plan to have 4 weeks remaining AFTER development is done

Senior Project
Final Self-Assessment