# 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: RIsoTopes

### Project: Molecular Mission

### Sponsor: Joseph Lanzafame

### 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?**

We are still finishing up our final documentation. Not much was requested in the way of documentation beyond what was required by the SE department. We will be reviewing the documents that we determined were needed (discussed later) as a team before handing them in.

1. **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?**

For eliciting requirements we conducted interviews with our sponsor. This wasn’t as successful as we had hoped since our sponsor didn’t seem to care what the details of the game were as long as it was something students would play and was reasonably realistic. After about two interviews we switched approaches to one where we came up with requirements and validated them with the customer. This was much better since our sponsor seemed to have more of an opinion on things when presented with options.

1. **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?**

We did not explore the entire design space before arriving at a final design. A lot of design/architecture decisions were actually made by Unity for us. What we designed was the game itself. As it is we started implementing some features before we had finished designing exactly what we wanted to accomplish. There were not any significant changes to our design.

1. **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?**

We made quite a bit of progress but there is still a lot of work left. Since this is a game significant effort is still needed on the game’s artwork and overall look. The game play mechanics we added also need fleshed out more. Mostly by adding more types of tasks, molecules, and statistics to track. There is still also only one level. We are providing several documents to help future teams hit the ground running. We are providing a game design document which outlines our high level view for the game, a features document which describes the features we added and what still needs to be done for them, and documentation on the deployment of the server.

1. **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?**

Testing the game was done manually. It is possible to write unit tests for Unity but we decided that the amount of effort required wasn’t justified when the changes we were adding could be manually tested quite easily. We did perform unit testing on the Connection Utility used to connect the game to our server. Most of the bugs we found were relatively minor bugs. The only major “defect” we found was a problem with the serialization library we were using in the Connection Utility. MonoDevelop (IDE) and Unity run on different versions of .NET with MonoDevelop using a newer version. That version supported the serialization library we chose while Unity did not. This was not found until trying to run the game since the unit tests were run through MonoDevelop which worked fine. This required us to switch to a different serialization library that Unity actually supported.

1. **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.**

Economic issues

There is still the issue of adding an artist to the team. Future teams will need to either get a graphic designer or 3D artist to take Senior Project or hire one. As previously stated the game needs significant work done on the artwork.

Environmental issues

N/A

Social issues

N/A

Political issues

N/A

Ethical issues

N/A

Health and safety

N/A

Manufacturability

N/A

Sustainability

N/A

1. **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?**

There were not any standards that we had to adhere to. Our game design student had to learn a little about software engineering practices and standards and the rest of the team had to learn about game design practices and standards.

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

The sponsor did not specify any practices for us. We were allowed to make almost all of our own decisions about where the project should go and how to run it.

### 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?**

We chose Scrum as our process methodology, and we felt it was appropriate for this project since our sponsor did not have many set requirements for us and gave us plenty of creative reign as to the direction of the game and server. The only modification that we made was that we changed our daily stand-ups to take place through Slack when someone made progress on any individual day, and we arranged our stand-up meetings to be twice a week to correspond with the senior project meeting times. If we could repeat the project we would consider using a different process methodology more since development on the game was difficult to break down into two week sprints. Therefore, we would try to solidify our requirements more in the beginning and use those to drive iterations in the Evolutionary Delivery process methodology.

1. **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 a significant requirement to learn the game design domain for this project. However there was not a large requirement to learn the chemistry aspect of this project. Therefore, in order to learn game design and the Unity game engine a bit more we worked through tutorials in the fall semester and focused on the game itself in the fall so that everyone on the team would have experience with the game engine. Unfortunately however, since our sponsor is a chemistry professor he did not help much with regards to some of the game design aspects of the project. He did however provide suggestions for specific things about the game and gave us feedback based on what he learned with the previous senior project team.

1. **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?**

We used Trello to track our project in terms of user stories and sprints. Trello did give our team and our sponsor good insight into project progress and issues because we were able to see which user stories were delayed and which ones were on track. Honestly though, we didn’t really update the department project site very often since we provided links to our Google Docs on the department website.

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

For the most part the team conducted effective meetings. Prior to every meeting an agenda was laid out either formally on the Google Drive that we used, or informally and that agenda was used to drive all meetings. However, there were some times where the team got off track in a meeting or decided to end a meeting earlier than expected since there was not a lot cover.

1. **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 almost all project milestones. The only major milestone that was missed was that we were not able to add a new level to the game. One of the major contributing factors to this was that plans to add an artist to the team fell through, and the team reprioritized adding another level to be a stretch goal since no one on the team had any 3D modelling experience. Also, the team did miss some end of sprint milestones for completing certain user stories but these were not as major since the team readjusted their sprint backlog next sprint to account for this. Therefore, to ensure that milestones were met the team could’ve been a bit more accurate in estimating how long it took to develop user stories.

1. **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?**

The team was required to adopt new technologies. These technologies were Unity for the game aspect of the project, and Node.js, MongoDB, and Express.JS for the server side. The team did not have much input for selecting these technologies since they were already incorporated into the project due to last year’s team. The sponsor also did not provide us with any resources for these technologies since he does not have the expertise to guide us in that way. The team did pretty well ramping up to learn the new technologies though since the team included a game design student and he helped the team by answering questions they had and debugging code with the team.

1. **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 adequate quality control over project artifacts. Every team member has been reviewing project artifacts as the project progressed, except for source code, since the team was split into server development and game development. Therefore, team members working on the game reviewed game-related code, while team members working on the server reviewed server-related code.

1. **Did the team have any issues with configuration management? How were these problems solved? What percentage of project artifacts is under configuration control?**

The team did run into issues with script configurations that were within the game. The main cause of these problems was that these configurations were saved as binary files that were only used by Unity. Therefore, whenever the game was committed to our repository either these binary files were not committed, or they were unable to be used whenever someone else pulled from the repository. This issue was solved by changing a Unity setting that made a project settings be saved a plain text. Beyond that however, the team did not run into configuration issues with the server other than having to change the final deployment mechanism from Heroku to AWS, which was anticipated to begin with.

1. **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 tracked project velocity, which was the number of story points completed per sprint, and defect density which was the number of defects found within a particular module of the project. The team did not formally gather these metrics on a consistent basis. However the team internally kept track of velocity by looking at the project’s Trello board, while defect density was tracked through discussion and personal notes. Through these metrics the team learned which areas of the project were more prone to problems since defects found within project also led to some delays in our velocity. Specifically, we learned that adding new features to the game were significantly more difficult than we had anticipated and that they were more error prone compared to features on the server side.

### 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 been 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?**

We handled communication of our progress by inviting our sponsor to some of our meetings to show him what we completed. Our sponsor was thankful that the meetings were, for the most part, at the same time each week. There were a few times when we had to reschedule through email, and any issues were discussed and solved to help both parties.

1. **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?**

We had an issue about the deployment for the web client. Our sponsor wanted to use godaddy, but our architecture and technologies did not work with it. We helped talk out an alternative during one of our sponsor meetings until both parties agreed.

1. **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?**

For the most part, this was an effective team. Everyone had a goal to complete and worked together to achieve them. We did have problems getting frustrated with the project and not wanting to keep working, but we pushed through. We might have been more effective if we planned times to all work together and cooperatively work through our issues.

1. **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?**

We used emails to communicate with our coach. He was very good at getting back to us in a timely manner and answering our questions effectively. There were only a couple trouble spots where our coach was out of reach of his email, but those were very few and far between. There was not much we could have done to improve our communications.

1. **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 only time we had to interact with the system administration was when we were not given access to our webserver as soon as possible. We emailed them in a professional manner, and the problem was handled. There were no problems to this.

1. **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?**

Our webserver did not officially store our documentation, but it did have links to our documents that were stored on Google Drive. Therefore, anytime the documents were updated, the webserver was updated.

1. **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?**

We made presentations of our progress at every sponsor meeting we had. We would prepare what we wanted to show to our sponsor beforehand. Our final presentation was practiced multiple times before we had to show it. We took the time to make sure it was professional, accurate, and on-topic. We could’ve made sure that the demo was 100% perfect. We had a slight hiccup in the demo with something not appearing like it should have, but we handled it as well as we could.

1. **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?**

At this time, our technical report is not completely finished. Each member of the team has a section to work on and make sure it is up to the quality it should be. We will meet with our sponsor to make sure each part meets his expectations and add any suggestions he has.

### 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 did possess adequate management skills when it came to carrying out the project. However, we still could’ve improved our definition of done for our Scrum user stories since at the end of our sprints we still needed to integrate the game and the server side together.

1. **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?**

Working with a game engine was quite a bit different than anything the software engineering students on the team have had done. Other than that we were adequately prepared.

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

Working on a game it would have been useful to have an artist or graphic designer on the team. The work that we did is very basic visually and would need art assets prior to an actual release. Also having a game design student dedicated to the class the entire year would have been useful. Our game design student was nice enough to continue helping us second semester even though he wasn’t taking the class but that meant other classes were a higher priority.

1. **Were the facilities adequate for you to perform your work on the project?**

Yes, we used our personal machines to work on the project.

### 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 sponsor seemed happy with our progress. We made a number of improvements to the base game which will give other teams a good starting point. Our only weak point is that we were not able to add another level to the game, which is in part due to the lack of an artist on our team. However, we did express these concerns about adding another level to the game to our sponsor so it was not unexpected when we didn’t have enough time to add a new level.

### 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?**

Overall the project satisfied the team’s expectations for learning. Working on a 3D game was an entirely new experience for the software engineering team members. Even the game design team member was able to learn more about general software engineering processes and principles from this project so we certainly had some cross-major learning experiences. The team could’ve made their learning experience easier by determining the proper setup of Unity and Git to help ease some frustration in that regard, but there wasn’t anything different from a department point of view that could’ve been done to help make our overall experience easier.

### 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?**

Make sure to keep your motivation up while working on your project and try to plan your schedule for senior year so that you have a good portion of time that you can use to work on senior project during any week in the semester.