

This document is intended as a guide for the senior project team to assess its performance in a number of dimensions. You need not answer each question in detail, rather, use the questions as a guide for the kinds of items to assess. Add items 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 first 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 interim project presentation, sponsor evaluation. These self-assessments will also be used as part of the SE program's accreditation effort.

To complete this self-assessment, the team should carefully consider each of the questions and provide an honest evaluation of the team's performance.

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?

The team prepared a few document artifacts, but there was not a lot of careful inspection in terms of correctness or accuracy. The documents were quickly peer-reviewed by other members of the team before submission.

2. How well did the team elicit the requirements? Are the requirements fully specified at this point? What approaches were used to elicit the requirements? Were key requirements missed? What methodology was used to document and validate the project requirements?

The requirements at this point in the project have been mostly defined and adhered to. Multiple meetings back and forth between the sponsor/coach and the team were necessary to generate the requirements list. More will be defined as the project continues to grow. Additionally, the fact that the project is a *research project* implies that the requirements are likely to change and are not set in stone.

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? Do you have a complete design at this point?

The team performed research spikes to learn more about unexplored aspects of the project, in order to create a more cohesive design. Integration and modularity were the key design aspects that the team focused on when constructing the higher-level, lower-level and intermediary design. One issue the team ran into was the use of Apache ActiveMQ, but the modular design on the high and low ends makes it very easy for the

team to which communication methods. Other than this change, not many huge design changes were made.

4. How has the development and implementation progressed? What percentage of the product do you estimate is complete at this point? Is the team providing the documentation within the implementation artifacts?

Due to the fact the project is research project, there is a list of “core features” that the team strives to complete in the coming semester, but other features and aspects of the project outside of this core list are innumerable and their necessity for the project as a whole is unknown. From this, in terms of “core functionality”, the team is at least done with 60% of the required features, since having completed manual interfacing with the arm and enabling a computer vision model to follow the user. The project is 100% done with the MVP.

5. What is the team’s testing strategy? Has the team developed a test plan? Is the team performing unit testing? Is the team using any test frameworks, such as JUnit? What are the testing results to date? Were any major defects found during system test?

The team has a testing framework on the low end (CPPUTEST), but most of the testing that was done was integration testing as part of the initial construction to reach MVP. No automated testing has been written at this point though.

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 there may be one or two categories that have no bearing on your project but your project is probably affected by almost all of these.

Economic issues

Ideally, extra components needed beyond the robotic arm can be as cheap as possible. This means that the software must utilize open-source options for utilities and the whole system must be able to run effectively on low-quality hardware.

Environmental issues

Since the goal of the project is to give new life to old hardware, the extra components that are added in addition to the robotic arm should be interchangeable with other repurposeable components. I.e. repurposed laptops and webcams could be used as the machine that runs the software system to control the robot and the tracking camera.

Social issues

The social implications of this project lie in its open-sourced nature. We must design this system so it is usable by anyone that wants to use it. Additionally, it must also adhere to open-source copyright laws.

Political issues

There are no significant political issues associated with this project.

Ethical issues

The computer-vision tracking algorithm will track people's faces and body shapes but must not keep any of this information for security and ethical reasons.

Health and safety

The robotic arm must be controlled in a safe manner so that no one who uses the software injures themselves.

Manufacturability

Similar to economic and environmental issues, aside from the requirement of the robotic arm itself, the whole system should be designed to be made cheaply as well as high-quality.

Sustainability

Similar to environmental issues, aside from the requirement of the robotic arm itself, the whole system should be designed to function with repurposed components in mind.

7. What industry and engineering standards must your project 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?

Engineering standards that were adhered to were basic robotic safety and open-source structure.

Process and Project

1. What is your process methodology? Has this been clearly outlined to your sponsor and received the sponsor's approval? How is the process documented?

Our process methodology is a spiral model with a research oriented focus. The process has been clearly outlined and the process is clearly documented in an open-source GitHub repository.

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 a large requirement to learn the project domain, namely: the Scorbots ER-V and ER-4u. Given the nature of the research of the project, a lot of learning and experimenting in terms of learning how to interface with the hardware.

3. What mechanisms is the team using to track project progress? How well has the team tracked its project progress? How often do these artifacts get updated on the department project website?

The team had been using the GitHub Issues to track individual ticket items. At the end of each spiral iteration, a demo is presented to the sponsor/coach, showing the progress of the project physically. Additionally, an iteration document outlined the features that we hoped to achieve that iteration.

4. Is the team conducting effective meetings? What can be changed to make the team meetings more productive?

The team has been meeting at regular times throughout the week. Meetings could still become more productive with sub-team agendas and objectives so all bases of the project are covered.

5. Has the team met all project milestones to date? Which milestones, if any, were missed or were met ahead of schedule? What contributed to this schedule changes? What will the team do differently to ensure that future milestones are met?

Most milestones were hit before the deadline came. There were a few times when progress was slow due to some complications on the hardware interfacing end, but the team met up more times immediately after those speed bumps were hit in order to still reach those milestones.

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?

ActiveMQ is used as a message bus between the high-level software and the low-level software. This software was used since it is opensource and free to use with integrations for both Python and C++. The team still struggles with complication issues for the C++ library of ActiveMQ, and so that technology is likely to be swapped out with pure socket communication.

The other large technological hurdle was learning how to properly interface with the Scrobot on the low end. This was the largest learning obstacle the team encountered.

7. How well has the team maintained quality control over the project artifacts? Have all artifacts been reviewed for adherence to quality standards? What is the review process used by the team?

The team has been doing code reviews for pull requests and pull requests were only made and merged when all approvers knew (as far as they understood) that the code worked.

8. Has the team had any issues with configuration management? How were these problems solved? What percentage of project artifacts is under configuration control?

There have been no issues with configuration management. Project artifacts are version controlled through Git and the source code has clear requirements in order for it to run properly.

9. What is the set of metrics that the team is tracking? Has the team gathered these metrics on a consistent basis? What has the team learned from the review of these metrics?

The team is tracking: bus number, PR confidence, communication response time, and time to back in frames.

Communication and Interaction

1. How well has the team been communicating project progress to the sponsor? What regular communication does the team have with the sponsor? Has the team been maintaining 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 has been giving end-of-sprint demos to the sponsor, showcasing what has been achieved over the sprint. Communication was to the satisfaction of the sponsor, so no changes were needed.

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

The sponsor needed some background on the feasibility of the proposed computer vision solutions. We gave a background on what ActiveMQ is and how we plan to use it.

3. Is 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 can the team make for next term that will make it more effective?

Yes, this is an effective team. Added meetings outside of normal meeting times ensure we meet product deadlines when more time is needed. The team could start product deliverables earlier. The team's weak point is the separation of knowledge between sub-teams. The strong point is that each sub-team is extremely comfortable working in their domain.

4. What mechanism does the team use to communicate with the faculty coach? Has communication with the coach been effective? Are there any trouble spots with the faculty coach communications? What can the team change for next term to make their communication to the faculty coach more effective? What can the faculty coach change to make his or her interaction with the team more effective?

The team communicates with the sponsor/coach through weekly meetings where we give updates. When a matter that is more time sensitive appears, the team reaches out through email. There are no issues with communication between the team and the coach. One thing that could be improved is reminding us of important deadlines.

5. Has the team needed to interact with department staff personnel, i.e. the office staff or Kurt? Has this been handled in a professional manner? Were there any problems with these interactions?

The team has not needed to interact with department staff.

6. Does the team have a complete website with all project artifacts stored and up-to-date on the software engineering department webserver, i.e. linus.se.rit.edu? How often are entries on the webserver updated?

All information about the project is kept on our public GitHub and not on a website. We track all our code, documentation, issues, task tracking, user guides.

7. How well has the team made presentations to the sponsor and faculty coach? Was the interim project presentation done in a professional manner? What can be done to improve the team's presentations?

Presentations were satisfactory to the sponsor/coach. Presentations were done in a semi-professional manner, but we should have dressed more professionally for our final presentation.

8. How well has the team worked with other senior project teams, coordinating access to lab space and equipment, sharing experiences and ideas, etc.?

There has been no need to interact with other teams because we have our own project room and own resources.

Achieving Customer Satisfaction

1. In the team's opinion, has the work accomplished to date satisfied the project sponsor?
Were there any weak spots in this regard?

Yes, we feel we have met the sponsors expectations. We have implemented a functional MVP and have begun exploring other implementation/project ideas. We still can refine our code by refactoring and making the project more useable for non-technical users.