# **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. 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 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: Deli-cious Developers

### Project: Wegmans Deli Kiosk System

### Sponsor: Wegmans

### 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?**

At this time documentation artifacts are being updated in preparation to send to the sponsor. All documents requested throughout the year were high quality and were delivered in a timely fashion, including the system features lists, the team’s weekly project status updates, usability testing instructions, and sideloading instructions for windows 8 apps.

**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?**

The team felt they elicited requirements reasonably well. The project had large scope, so it took many weeks and lots of questions to fully figure out what the customer wanted. Creating detailed user stories and use cases helped flush these out. We used an iterative prototyping methodology which allowed the requirements to be fulfilled in stages with a high degree of customer visibility and as a result no key requirements were missed. Initially we documented requirements and referred to them while planning the iterations for the rest of the project. We then started constructing incremental prototypes which helped validate the requirements. We were able to present a partially made product to the sponsors, and validate that the product was on track to meet the requirements we had agreed upon.

Having a timeline established and communicated to the sponsor at the start of the project would have been helpful with this process as well.

**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?**

The team spent a week or two discussing all of the different possible technologies that could be used for the project such as Android and iOS before arriving at the Windows 8 App/ Surface solution. No errors were found in that choice of technology, but it was found out later that the program might be used on a grander scale so some design decisions had to be adjusted to account for that. The only major change to the design was the addition of a ASP.NET application for performing remote management of the system. This requirement was added late in the process, but the reasons for the change made sense, namely support for remote deployment and configuration/re-configuration of the system across a large scale corporate infrastructure and improved ease of use of the system as the ASP.NET application provided more fine-grained and adaptive system administration capabilities then had previously been planned for.

Having a proof-of-concept for the genericness of our item catalog/workflow design would have been good and would have been beneficial for the sponsor.

**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?**

Development and implementation progressed well throughout the different iterations. The team tried to hit major milestones each iteration in order to address risk early on in the process. Development and implementation didn’t start until after all the requirements were essentially complete. The team believes the product is about 97% complete. The remaining things to complete would be tests covering extensive failure path scenarios and UI polish that would ready the product to be used in a production environment. In terms of features, the product is 100% with regards to our initial requirements. In fact, the team successfully achieved several of the stretch goals defined by the sponsors, so the product actually contains several features which go beyond these initial requirements. The team is providing extensive documentation within the project artifacts to ease the transfer of knowledge to the next person(s) to work on it.

**5. What was the team’s testing strategy? Did the team develop a test plan? If so, was it followed? Did the team perform 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 teams testing strategy was broken up into two parts. On the Kiosk side (Windows 8 app, c#), extensive unit tests were written in order to test the different functionalities of our server instead of developing a separate stand alone testing platform.The team did not develop a formal test plan, but tested ad hoc as the project progressed throughout the semester. The Team used the Visual Studio Unit Testing Framework on both the Windows 8 app side and also a little bit on the server side. The testing results revealed a number of small issues during the implementation process revolving around sending/receiving information between kiosk and server which were then corrected by that team; all tests are now passing and therefore show the team that the product is working successfully. There were not any major defects found during final testing of the system.

**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.**

**· Economic issues**

The sponsors worked closely with the team to see if any additional technology was needed and, in this case, the appropriate printers and Surface tablet were provided free of charge for the team to use for the duration of the project.

**· Environmental issues**

A lot of paper was used in the process of implementing and testing the system for printing the many different receipts which were made along the way. Unfortunately, there is no fix to this as in order to test the full system functionality paper had to be used to print and validate settings.

**· Social issues**

One of the primary goals of the kiosk system is to speed up the process of placing orders at the Deli and, consequently, reduce congestion in the high-traffic areas around the deli area during busy times which will have a positive impact on customer satisfaction with their shopping experience (even for customers who do not use the kiosk system).

**· Political issues**

N/A

**· Ethical issues**

N/A

**· Health and safety**

Employee tracking by order was removed from the list of possible features for the application in part due to concerns regarding deli workers touching the tablet screen with gloves on which could introduce a food safety hazard.

**· Manufacturability**

N/A

**· Sustainability**

The project was implemented on an all Microsoft technology stack in alignment with the technology stack currently used at Wegman’s in order to better allow for the sponsor to continue development and support of the system using existing in-house expertise. Applicable design patterns and paradigms were also included in the system design as a part of the team’s proper application of object-oriented design principles to allow the system to be easy to support, improve, and/or change in the future. This included support for modifying the kiosk for use in other departments via the implementation of new custom workflows and decoupling of the client and server portions of the system through the use of a platform-independent RESTful server API.

**7. What industry and 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 no particular standards that had to be adhered to outside of the team’s internal expectation of how a software engineer should act and develop code. However, the team did use a small number of standards which were formalized within the team such as interface naming, but these standards were not explained in detail since they had little relevance to the sponsor.

### 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 the Incremental Build Model. This is a process model which involves a series of iterations which all produce a major work item or a functional prototype at the end. At the end of the later iterations, we had produced a possible deployable product. The team then continued these iterations until we had a final, deployable product. This process worked out very well for our team. It helped us to address our major risks early in the project and determine what our high level goals were for the project. It also allowed us to focus on our architecturally significant features very early in our code construction, which helped us to develop a very structurally sound product. The process was not strictly followed, as we did not always re-address our risks at the beginning of each iteration, but overall, the team did adhere to the structure of the methodology. If we could repeat the project, we wouldn’t have changed a thing with the methodology since the project went really well for us.

**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 problem domain. This project was unique because it required delving into a few different technology domains, including printing receipts using ZPL and Zebra printers, using XAML and c# to make Windows 8 Apps, and knowing .NET and services to create a WCF application. Additionally, the project required a solid understanding of the Wegman’s deli process related customer expectations.

The approach taken to gain the required technical expertise was to simply explore and search the internet for tutorials to follow and examples to look at and try. The sponsor was never asked to contribute any extra knowledge to these particular domains. The team did solicity the sponsor for information regarding the problem context, but no further research or exploration of the problem context was necessary since one of our team members had previously spent several years working in a Wegman’s deli.

**3. What mechanisms did the team using 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 website?**

The team initially decided to use Microsoft project to track the teams status, but this was thrown out for the easier to use and more efficient Team Foundation Server. All of the requirements for all 4 iterations were laid out in TFS, and all of these requirements had work items attached to them which had time estimations. The actual time values were entered as these tasks were completed, which allowed both estimation accuracy and project progress to be easily tracked. The team gave the sponsor a TFS account so they could easily view our progress throughout the project. In addition to this, the team provided the sponsor with weekly status update reports which allowed the sponsor to easily see if any features or tasks were at risk of not being completed for the current iteration and the team also tracked the hours each team member spent working on project tasks each week using a Google spreadsheet, with this information being automatically charted and posted onto the project website.

Overall, the team feels that it was effective at tracking its progress, which is supported by the ultimate shape of the iteration burndown charts generated by TFS and the fact that very few features were pushed off to later iterations over the course of the project. The TFS tasks were updated whenever the developer was done working on it and the documents on the department project site were updated as necessary. In the first semester, the site was updated frequently as new documents needed to be added on a weekly or bi-monthly basis. However, since the team was working mostly on code construction during the second semester, there weren’t many new documents that needed to be added to the site. As a result, this only happened a few times during the second semester.

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

The team conducted effective meetings throughout both semesters. The team’s standard practice was to create an agenda prior to each sponsor meeting which was provided to the sponsors at least 24-48 hours prior to the meeting so the meeting could be effecient and no time would be wasted. After each meeting, the sponsors were also provided with a meeting summary, including a list of action items from the meeting.

**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 of the project milestones. There were a few features that were done ahead of time so additional stretch goals were pulled in from the project backlog. The schedule changed slightly when a team member had car troubles and was unable to make it to a meeting or do any significant work for about a week .

**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?**

As mentioned above, the team was required to adopt new technologies, including ZPL for printing to zebra printers; WCF services; and Windows 8 app development. The appropriate technologies were chosen by carefully analyzing all of the different possible options and then choosing the one that fit the best and made the most sense. The sponsor offered to help if there was trouble, but for the most part wanted to see what the team could accomplish. The team ramped up very quickly on these new technologies and started delivering working prototypes at the end of each iteration once the development phase of the project started.

**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 over the project artifacts by use of the department website, TFS, and a shared Google Drive folder. Most artifacts have been looked over by more than one teammate, but no strict standards were set. The review process was simply going through and looking at the artifact and making sure they were acceptable and free from errors, with this process being performed as a team for key deliverables such as the requirements document.

**8. 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 had a little bit of ramp up time with setting up MS SQL and working with NHibernate and also with deploying the project to a remote server. Setting up a WCF service was also cumbersome and took longer than expected. These problems were solved by extensive internet research and testing. Aside from documentation and diagrams, 100% of the project is under configuration control.

**9. 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 the actual work done against the work-hour estimates made for each task in TFS via burndown charts. The team gathered these metrics at the end of every iteration. The team learned that the initial iteration took the longest to get up and running and there were a few errors in the estimations and number of tasks assigned. Things such as estimation and time spent were also tracked in a separate spreadsheet which was updated weekly. Although not implicitly tracked, there are potentially a number of other metrics that can be examined after the project using the data stored in TFS.

### 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?**

The team kept the sponsor up to date with the progress of the project by holding a weekly meeting. During this weekly meeting, the team would go over a status report of how the project was progressing. Additionally, the team gave the sponsors access to our TFS project account, where they could go and see how we were doing with the tasks on each iteration. Even if the team didn’t meet with the sponsor during any particular week, an email was sent to the sponsors with our status report attached. As for regular communication, the team would send an email to the sponsors two days before each meeting, which would contain our agenda for the meeting that week. Additionally, following each meeting, the team would send a followup email with a short meeting summary and any action items that the sponsors needed to complete. The team also sent additional emails to the sponsor whenever there was a need. The sponsors have expressed a high degree of satisfaction with our communication and how well we were keeping them up-to-date on the progress of the project and no changes were necessary.

**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?**

The team provided a little technical input to the sponsor in terms of the design choice chosen (iOs vs. Android vs. Windows 8). The sponsor was not too familiar with the different things like licensing and releasing the different applications for their respective platform. The team also provided some input for the architectural decision for not choosing HTML5. The team educated the customer in these areas by having detailed discussions during the normal weekly sponsor meetings and listing out different pros and cons for each choice and why it was chosen.

**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?**

This was a highly effective team. We were able to come together and work as a very cohesive unit. No one on the team slacked off and we were able to accomplish all of the goals and requirements that we had originally agreed to. The thing that contributed the most to our team’s success was how driven our team was. We set out to come up with a really effective and unique solution and we didn’t stop until we achieved this goal. Also, our team members never made commitments that they couldn’t keep. We didn’t have any team members that said they were going to get a feature done and then didn’t come through for us. The strongest points of our team would have to be that team cohesiveness and the drive we had to be the best. Additionally, our team wanted to develop something that we were really proud of, so we were all willing to put in the extra work to make sure that our project was the best it could be. In terms of weak points to our team, there really weren’t any. Some of our metrics and time tracking did begin to suffer near the end of the project and our testing of the system could have been more structured and comprehensive. However, this did not impede our progress or cause our project to suffer. We feel that our team was very effective and that there were no changes that needed to be made.

**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?**

We communicated with our faculty coach through email and face-to-face meetings. This communication was very effective as both the team and the coach were very responsive in their emails and would typically respond within a couple hours of the email being sent. There weren’t many trouble spots with the faculty coach communication. The only thing that we would have changed would have been the time that we spent discussing the previous weeks work during our Tuesday meetings. Most of the things that we discussed during these meetings were artifacts or information that were captured in our time tracking and/or TFS. We feel that we didn’t really need this extra discussion.

**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?**

In the beginning of the project, we had some interaction with Kurt. This was described in our last post mortem. However, since then, there has been minimal interaction with the department staff personnel. We had to contact Sarah in order to request the conference room for two of our end-of-iteration demonstrations. The interaction was handled in a very professional manner and we didn’t have any issues.

**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?**

 The team has a complete website available which has all of the project artifacts. These artifacts are either viewable or can be downloaded to the users computers. At the time of writing this assessment, all of the artifacts were up-to-date and this site is accessible on the software engineering department web server. The entries on the website were updated much more frequently at the beginning of the project. This was because we had much more documentation that was being generated which could be placed on the website. As we moved into our coding phase of the project, the website was updated only to reflect when there was a new artifact to be added.

**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?**

Our presentations to the sponsor and faculty coach was very well received. The team gave two smaller presentations on the status of the project which included a system demo at the end of each development iteration which were both well received by the sponsors. Our sponsors also came to our final presentation and the team was very happy with how the presentation went. In fact, our sponsors congratulated us and stated that we did a great job afterwards. Later, we gave a presentation to the Wegmans IT Managers and this was also very well received. Based on our responses that we got during all of our presentations, we believe that we performed in a very professional manner. The only thing that could have improved our presentation for the department would have been to have more time so that we didn’t have to rush. Also, when we gave the presentation to the Wegmans IT Managers, there was a small time delay during our demo portion. This was because our local setup was not the exact same configuration we had with our virtual machine at school. However, we were able to make it work and the sponsors were very impressed.

**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?**

At the time of writing this post mortem, our team was still in the process of writing the technical report. However, based on the level and quality of our work thus far, we are fully confident that the report will adequately document our project and our results and will be of the highest quality. Also, we have not run into an instance where a team member has not contributed their fair share of the project load, so this is not expected to be a factor for us. As we have not finished the report yet, the sponsor has not been able to review it and they are currently not contributing to that process.

**9. How well did the team work with other senior project teams, coordinating access to lab space and equipment, sharing experiences and ideas, etc.?**

This didn’t come into play very much on our project. There was only one time that we can remember, when our team signed out the conference room for a demo and another senior project team coach asked if they could use it, and we were able to give them access after we were done using it. Other than that instance, we did not have to coordinate access to equipment.

### Achieving Customer Satisfaction

**1. In the team’s opinion did the work satisfy the project sponsor? Were there any weak spots in this regard?**

The team believes that the work we have done has most certainly satisfied the project sponsor. They have verbally expressed, on many occasions, that they are satisfied with our final product and when we gave the final presentation for our sponsors we received a large ovation. Also, our sponsor took us out to dinner at a very expensive restaurant and many of the people who saw our presentation were saying how great of a job we did. As far as having any weak spots, the sponsor did not say that they felt there were any weak spots to our project and the Wegman’s Vice President and primary product sponsor, Richard Vanderhorst, already expressed an interest in deploying our system in a limited capacity in the coming months. Overall, the sponsors were very satisfied with our performance and we were even able to finish all of the stretch goals that we initially set out to complete.

### Achieving Team Satisfaction

**1. Did the project satisfy the team’s expectations for learning? Were there any weak spots in this regard? What could have been done differently to improve the team’s learning experience?**

The project did satisfy the team’s expectations for learning. Each team member was able to explore a new technology area which matched their personal interests and we were able to take a project from its inception all the way to possible deployment. This was something that we never got to do in any of our projects and this was probably the largest project any of us have worked on. Also, we had a really great team and that helped to enhance our experience on this senior project. This project went really well for us as a team and because of that, it turned out to be a very satisfying experience for all of us. The only weak spot to the senior project was the fact that we didn’t have more time to work on it. Even though we were able to get a large number of features done on our project, we always had more that we wanted to add and just didn’t have enough time to do it. Other than that aspect, this experience was a very satisfying one for us. Therefore, as a team, we would have liked to only have senior project going on when we were doing our second semester.