

# **Capital One Agile Maturity Assessment Tool**

A Technical Report submitted to the Department of Computer Science

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On my honor as a University Student, I have neither given nor received unauthorized aid on this assignment as defined by the Honor Guidelines for Thesis-Related Assignments

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## **Capital One Agile Maturity Assessment Tool Technical Topic**

### **Technical Topic**

#### **ABSTRACT**

During my internship as a Software Engineer Intern at Capital One, I built an agile maturity assessment tool to standardize agile methods across different lines of businesses and Capital One as a whole. Standardization of the agile methods across Capital One enabled the company to bring even more cutting-edge technology and forward-thinking solutions to the Financial Tech sector. The programs used in developing the agile maturity assessment tool included Java Spring Boot for the server side, Angular for the client side, and Amazon Web Services for deployment to production. The outcome of the project was a number of teams picking up the assessment to use in the future after the final summer presentation. The project fulfilled its original purpose by creating a simple yet elegant user interface to standardize agile maturity across a company. Some future work to be completed are to incorporate other user stories into the application, some of the most important being Google integration or JIRA board integration so teams can easily track their progress.

#### **Nature and Purpose of Project**

The nature of the project was creating an agile maturity assessment to be distributed to Agile Development Leads throughout Capital One. The final vision was to have all Agile Development Leads at the entire company taking these assessments for their software development teams to gather data on teams and their agile maturity, with the agile maturity relating to the efficiency of the teams and the quality/speed of product delivered. The purpose of

the project was to standardize the workflow of software teams at Capital One in order to maximize efficiency and to create a widely used tool in house rather than outsource the product.

## **Work Accomplished**

A wide variety of features were added to the application. The first feature added was creating server-side code to add table entries in the PostgreSQL database which contained important team details such as team IDs, time of submission, etc. when a team submitted an assessment.

Another feature added was the ability to have an admin user lock assessment on a certain date, meaning all the teams in their sub-line-of-business were required to take the assessment by the given date. This ensured all teams completed the assessment by the certain date so that analysis could be performed and teams who needed to increase their performance would be notified immediately.

An important feature for users was the ability to add comments on assessments so that future assessment questions and answers could be molded to better match the agile methodologies of teams at Capital One. To accomplish this, a comment box feature was added on the client side using an Angular component which stored the text from the user, then this comment was saved to a new column in the PostgreSQL table through adding another field in the Java Spring Boot classes.

In order to easily perform data analysis on team assessment data by admin users, an export CSV file was created. This allowed admin users such as Agile Development Leads, Vice Presidents, and others to export all their team(s) data and the scores each team received on each assessment area. The data was organized by team, then sub-line-of-business, then

line-of-business. This organization of data allowed the admin teams to group their data by divisions, as well as create figures for presentations using the values of the scoring.

Arguably the most important feature of all added was the redesign of the client-side web pages. The redesign incorporated bar graphs, line charts, and a more colorful presentation of data to the user. This more eye-appealing redesign was a key factor in spreading the usage of the application by creating a more user-friendly website as well as one which showed only the necessary data without extra clutter.

## **Significance**

Previously there had been no way to measure the metrics of agile maturity at Capital One. This application will help to standardize agile maturity across teams, lines of businesses, and Capital One as a whole. The standardization of agile maturity at Capital One will lead to more streamlined release dates and a higher quality of products at Capital One.

## **Program of Study and Preparation**

The classes which most helped me to prepare for my technical applications were Advanced Software Development (CS 3240) and Program and Data Representation (CS 2150). Advanced Software Development taught me the concepts of web development, more specifically the best practices to use when working with POST and GET requests, as well as how data is transferred between the server and client side. Program and Data Representation taught me the nuances of the command line and how to optimize my programs by choosing the correct data structures.

Some things in the Computer Science curriculum I would like to add are a requirement to learn more about the usages of Integrated Development Environments (IDEs) as well as Version Control. With Version control being the backbone of any software development team, Git and other version control tools should be taught in order to be comfortable with branching, reverting, and commit history (Gehman 2019). Finally, an ability all managers and software engineers at Capital One had was knowing how to navigate as well as the tricks of IDEs. This simple ability allows me to complete time consuming tasks such as tracing method calls or following debuggers with ease.

## References

Gehman, C. (2019, May 23). *What is version control and how does it work?* Perforce Software. Retrieved October 24, 2021, from <https://www.perforce.com/blog/vcs/what-is-version-control>.