McDonalds eLearning Application

FINAL REPORT

William Nolan | C00216986 | April 3rd, 2020 | Chris Meudec

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1. Introduction

This document marks the completion of my final year project titled 'McDonald's eLearning Application'.

The idea behind this project was to create an application that would replace the need for paper form *Station Observation Checklists* (SOCs) and provide a more efficient and practical means to train new and existing McDonald's employees.

This document will cover all aspects of the project including:

1. A project description
2. How the project followed the initial Functional Specification
3. Learn outcomes both personal and technical
4. A project review
5. And finally, acknowledgements to those who helped me throughout this project.

2. Project Description

McDonald's eLearning is an application with the intent of improving initial and on-going training for McDonald's employees (Crew Members) whilst removing the need for paper forms known as SOCs. The application takes these paper forms and transforms them into digital multiple-choice quizzes. Crew Members would have access to these quizzes whenever they wanted, giving them free range to brush up on McDonald's techniques and essential information.

The application also provides other functionalities that allow for Crew Members to review their results and progression which previously wasn't visibly clear to them. This allows them to identify areas they're struggling in and focus more of their attention to improving in that station. Crew Trainers and Managers also have access to view Crew Members' results and progression and also can leave feedback on their results.

The application aims to get Crew Members to consistently learn and improve. A huge percentage of McDonalds' employees are often part-time meaning, with the current system, there could only be 1 to 3 days where the Crew Trainer could perform SOCs on them. This application would benefit these part-time employees by giving them access to SOCs whenever they wish.

The application also has a gamified experience. Taking an SOC also gives you a score based on how many answers you got correct, how quickly you answered the questions and if you built up a streak. The score is added to an individual leaderboard for each SOC. This also encourages Crew Trainers to improve as they would want to try to get the high score on each leaderboard. Each restaurant could also implement a competition where the top scorer each month gets a prize or golden ticket. Golden tickets are used at the store's summer and Christmas parties in a raffle to win prizes.

3. Conformance to Specification/Design

The project was developed over a 6-month period and stayed in line with the initial specification for the most part. The initial specification was to create a web and mobile eLearning application to replace the paper forms McDonalds use for employee training.

The initial specification required an application that allowed employees to take and practice SOCs and allowed managers to review SOCs. These requirements were met, although the practice SOCs functionality was removed upon receiving feedback, but considering this project was very simple I was tasked with adding additional value for the user.

The first piece of additional value was the Leaderboard functionality. To help encourage employees to keep on top of their SOCs I implemented a SOC Leaderboard. When an employee completed a SOC they received a score based on (number of correct answers + a time bonus + a streak bonus) which was then added to the Leaderboard. Restaurants could then implement a system where they reward the top scoring employee each month.

The other piece of additional value I implemented was the Progression system. Having the ability to review previous SOC results is beneficial but it's difficult to grasp an employee's progression from a table of records. The Progression page allowed managers to view an employee's progression in the form of a line graph. This would allow managers to quickly identify the employee's strengths and weaknesses and which station they need more training for.

The final piece of additional value was the ability for managers to leave feedback on an employee's result. This already exists with the current paper forms system but was not included in the initial specification. This part of the SOC process is very important as constructive feedback is a huge part of employee training.

4. Learning Outcomes

4.1. PERSONAL

Overall, I learned a lot from this project and from fourth year itself.

Time management was a huge factor throughout this project and despite being behind in the first semester I managed to gather my bearings and produce a final project at the end of it all. Between other continuous assessments, examinations and keeping on top of the project time management was difficult. I made use of a *Trello* board to help me track which tasks I need to focus on and this really helped me learn how to prioritize.

Taking the agile approach to this project was also extremely beneficial. Aiming to have a small task done each week to show progression and get feedback helped more than I could have imagined. Not only did it prevent me from going in the complete wrong direction but also kept me motivated and focused on smaller functionalities rather than getting hung up on the big workload ahead. This paired with my weekly meeting with my supervisor really helped me stay on track and is definitely something I will be continuing in future projects.

Throughout this project, I often hit times where I was stuck on some problem or had some kind of developer's block where I could sit for hours trying to get some functionality working. When I encounter a problem, I keep at it until it's solved. This often led to hours spent on something that would be solved in 10 minutes the next day. I learned that sometimes it is better to step away from the problem, take a break and approach it a different way.

4.2. TECHNICAL

From a technical point of view, I learned a lot from using different technologies.

During this project I learned a lot about:

1. Ionic Framework
2. Angular
3. JavaScript
4. Firebase
5. HTML5
6. CSS
7. Visual Studio Code

Having previously only done a small bit of JavaScript in our second year of college, taking on a final year project centered completely around Angular was a task in itself let alone adding the Ionic Framework to the mix. Despite my initial struggles getting used to Angular and understanding how to perform even the simplest of tasks I can happily say that I have learned a lot about the framework that I could take into the industry.

The Ionic Framework was a big risk in itself as I hadn't heard much about it before and was unsure whether it would work for my solution but it surely paid off. Being able to create a Progressive Web Application that I could deploy as a mobile application fitted perfectly for this project. Ionic also provides a lot of its own components that allowed me to create a good User Interface (UI) with minimal effort. UI was really important for this project as it had to appeal to the user. Having in-built components with good UI allowed me to focus on developing functionalities rather than getting caught up designing components.

Working with Firebase was a new experience for me as previously I had not worked with a NoSQL database. At first it was a bit daunting but upon developing my own structure for the database it was a walk in the park. I also used Firebase's hosting service for my application and deploying and managing it could not have gone smoother.

5. Project Review

5.1. WHAT WENT AS PLANNED?

At the end of this project, I'm happy to say that everything went as planned. The development of this project couldn't have gone smoother and the end result is just as I imagined.

From the beginning of the development stage I was a bit concerned as learning a new framework can be quite challenging but I feel like I picked it up very quickly and produced a good project with it.

The final application does exactly what I wanted it to do. I believe I have accomplished what I have set out to develop although I would have liked to take this final product to McDonalds to get feedback on the functionalities and UI.

To conclude, I think this project went a lot better than I had expected. I learned a lot from developing with a new framework and completed what I set out to do at the beginning.

5.2. WHAT DIFFICULTIES WERE FACED?

The main difficulties I faced were early on in the development stage. As I mentioned before, I was working with a lot of new technologies that I had little to no experience with. Learning the inner workings of a technology can often be quite challenging and trying to get them all to work in unison proved its difficulties. Luckily, I had a lot of external resources to work with and the official documentations were very clear and helpful. Any error I encountered was quickly resolved.

At the beginning of the project a big concern I had was Android deployment. It wasn't something I had any experience with previously and having a mobile app was very important for this project. There was a lot of fiddling about between Visual Studio Code and Android Studio trying to get the project configurations in order before I finally got a released APK. After the first successful deployment I didn't have any trouble deploying updated versions of the application which was a huge relief.

5.3. WHAT CHANGED AND WHY?

As mentioned previously, the main changes made to this project were to the initial specification. I was tasked with adding additional value to the application rather than creating functionality that replaced the current McDonalds training process. The additional functionalities were aimed at giving the user a more clear view of their learning progress. The current McDonalds training process offers minimal feedback that is widely available to employees so I think this was a necessary change to the project and one that would be very beneficial to the user.

Other changes to the project were to do with the user's experience and the overall application design. For example, the initial create SOC process was very tedious. A user would have to create a basic SOC with no questions then navigate to the SOC's details page to add questions and answers. It also did not display what questions and answers were already associated with that SOC which could end up being very confusing for the user. The solution to this was creating a one-stop dynamic form for creating the SOC and its questions and answers. Overall, I think it created a much better user experience.

5.5. WHAT ADVICE COULD I OFFER SOMEONE ATTEMPTING A SIMILAR PROJECT?

One thing I wish I had gotten to do during this project was bring the application to the end-user for feedback. I had planned on bringing it forward towards the end of the project but due to the circumstances that arose it was not possible. Although, that would not have been the most ideal scenario either as I wouldn't have been able to act on the feedback this late into the project. If I were to do the project again from the beginning, I would have set harsher deadlines for functionalities and set up meetings with the Training Manager in my McDonalds restaurant to demo these functionalities. This was a big resource that I did not make good use of throughout this project.

5.6. DID I MAKE THE CORRECT TECHNOLOGICAL CHOICES?

Overall, I think the technological choices I made were correct. The Ionic Framework met all my initial requirements for a mobile and web application in theory and definitely fulfilled its role in practice. In comparison to Xamarin, the other choice I researched, it definitely triumphed as many of my fellow students had difficulties even getting set-up using that framework.

I also mentioned in my research document that the UI would be a big aspect of this project which was one of the determining factors for choosing Ionic. Ionic provides a lot of its own components which have a very appealing UI by default. These components were also very customizable through simple CSS. This allowed me to create a more unique appearance for the application.

5.7. IF I HAD TWO MORE MONTHS, WHAT WOULD I AIM TO ACHIEVE?

If I had two more months to work on this project, I would like to demo it to some of my McDonalds colleagues. Like I mentioned earlier, user feedback is a huge resource that I did not make use of throughout this project. I have no doubt that my colleagues would have constructive feedback that would help improve this application.

In the two months, I would also trial the application in my McDonalds restaurant. Seeing how the application performs in a real-world scenario would be heavily beneficial for this project. This would further allow me to extensively test the application and improve its reliability.

5.8. DO I THINK THE PROJECT IS A SUCCESS?

Overall, I think this project was a success. I set out to create an eLearning application to replace McDonalds current training system and I believe I have completed just that. As mentioned multiple times earlier, I do wish I had gotten more user feedback as I think it would have helped to tidy up loose ends and tie the whole project together.

I also believe the project was a personal success. I had set out initially with the goal of exposing myself to new technologies and improving myself as a software developer. I have definitely learned a lot throughout this project and I hope it stands to me as I pursue my career in software development.

6. Acknowledgements

I would like to take this opportunity to acknowledge those who helped me throughout this project.

Firstly, thanks to my fellow classmates for allowing me to bounce ideas off them and borrow their eyes for the odd code review throughout the year,

Thanks to all the supervisors for the feedback they gave during project presentations and demos, it was highly appreciated.

And finally, thanks to my project supervisor, Chris Meudec. To answering questions, providing constructive feedback, and encouraging me to keep on track, Chris has been invaluable to have as my supervisor for this project.