A close up of a sign

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**FINAL YEAR PROJECT DISSERTATION**

By

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A thesis submitted in partial fulfilment of the requirements of the degree of

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**ABSTRACT**

The retail sector is a multi-trillion euro industry and yet the action of purchasing an item in-store has not evolved. With our project we looked at retail model and then set out to design an innovative alternative approach to where the consumer would no longer be required to waste time queuing up at a checkout till waiting to pay for their shopping. Together we decided to create an easy to use mobile application that could be designed for any supermarket or store and that would incorporate our objectives. Our application includes NFC (Near Field Communication) Functionality, Stripe Payments, Camera Functionality and Firebase Storage. This assignment was developed using Ionic 4, Apache Cordova and Angular Framework. Throughout the dissertation we will discuss all of the various issues that we encountered. We will illustrate the solutions that we chose to implement and then the overall conclusion as to why we chose the various methods that we did to complete our technology.

**Authors:**

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# Introduction

In 2018, retail sales in Europe totalled to around 3.25 trillion euro. By the year 2023 that figure is forecast to reach a value of around 3.55 trillion euro. Since the early 2000s, online retail companies such as eBay and Amazon revolutionised the method in which consumers spend their money. These companies discovered a demand from the customer’s point-of-view to have a more convenient approach to their shopping experience. This revolutionary approach received overwhelming success. Subsequently this forced the global retail industry to embrace their online business strategy and to develop their own online presence. Netflix are another excellent example of a company that recognized - by transitioning online, the consumer would purchase their product because of the sheer convenience. In business you have to aim for growth if you wish to succeed and yet the retail in-store experience has not made that similar progression.

Conor and I brainstormed various potential ideas before we decided to develop an application that we believe will improve the customer’s overall shopping experience. According to PWC.ie [1], fifty-four percent of Irish consumers still shop in-instore weekly so if the larger portion of the population still shop in-store - we felt that we should try to incorporate what they could want as well. The concept of our application was to develop a marketplace where it would make it easier for the retailer to sell their products to potential customers in an online environment but to also add a feature that would allow the consumer to purchase any item in store by simply tapping their phone on a desired item. This feature is designed towards the in-store customers. We believe this feature could have many advantages such as time efficiency. The idea is that if a customer enters the store and is under time constraint. All they have to do is take out their phone with our application running, tap their mobile phone on any product they wish then enter their card details on the application and away they go. This eliminates the risk of waiting in a queue for ten minutes or many times even longer if you are located in a largely populated area. With the widespread outbreak of the Coronavirus disease (COVID-19) this feature also has the added benefit of reducing potential interaction with a cashier that may be feeling ill.

Our objectives for this assignment were to develop a mobile application that is compatible with the android operating system. Then to integrate a database that would store details such as a user’s login details, product details, images and order details. Our next objective was to design a marketplace that the retailer can upload their products and that is easy for the user to operate. After that we set out on adding NFC (Near Field Communication) functionality to our application. NFC allows for two-way communication between your NFC enable phone and another NFC device. When we were satisfied with the NFC addition, we then had to develop a payment method for selling the retailer’s products. Lastly, we had to complete an overall test of each component to make sure that entire application was performing in the way that we intended it to.

This dissertation will progress with the following chapters: Methodology, Technology Review, System Design, System Evaluation, Conclusion, References and Appendices. Methodology will underline how we developed our application step by step. Technology Review will describe each of the technologies that we decided to implement. System Design will present an in-depth description of the overall system architecture. System Evaluation will include an comprehensive evaluation if our project met the objectives that we initially defined and Conclusion will consist of a brief summary in reference to our dissertation.

The link to our GitHub Repository is: https://github.com/kodama96/FinalYearProject

# Methodology

In this chapter we will illustrate how we went about the development of our final year assignment. Methodology refers to the way in which we organize and conduct the development process of our assignment. We will discuss in greater detail our approach from the various different types methodologies which can include Agile methods, Incremental methods and Iterative methods. For our project we chose to incorporate the Agile methodology. We will review the inevitable complications involved with designing an application. We will then outline our planning and discuss our meetings throughout the academic year.

# Technology Review

# System Design

# System Evaluation

# Conclusion

# References

# References

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| [1] | J. Dillon, “Irish Retail and Consumer Report 2019: Investing in Experience,” *PwC network,* pp. 2-3, 2019. |

# Appendices

GitHub Repository

The link to our GitHub Repository is: https://github.com/kodama96/FinalYearProject