**UNIVERSITY OF GHANA**

**DEPARTMENT OF COMPUTER SCIENCE**

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**AN E-COMMERCE APPLICATION FOR ONLINE SHOPPING THROUGH SECURED PAYMENT METHODS**

**CASE STUDY: ACCRA SHOPPING MALL**

**A DISSERTATION SUBMITTED TO THE DEPARTMENT OF COMPUTER SCIENCE, IN PARTIAL FULFILLMENT OF THE REQUIREMENT PRESCRIBED FOR THE AWARD OF A BACHELOR OF ARTS (BA) DEGREE IN COMPUTER SCIENCE**

**BY**

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**DECLARATION**

This declaration is made on the ………. day of June 2018. I, Dennis Kwabena Bilson, with ID 10527738 of the Computer Science Department hereby declare that the work entitled “An E-commerce application for Online Shopping Through Secured Payment Methods” is my original work. I have not copied from any other student’s work or from any other sources except where due reference or acknowledgement is made explicitly in the text, nor has any part been written for me by another person.

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**DEDICATION**

First of all, I thank the Lord Almighty for helping through this project and bringing it to a successful end. This project work dedicated to my parents, Mr. George Bilson and to my benefactors, Mr. and Mrs. Ishmael Oku for their invaluable support to me all this while.

**ACKNOWLEDGEMENT**

I have taken efforts in this project. However, it would not have been possible without the kind support and help of many individuals. I would like to extend my sincere thanks to all of them.

I am highly indebted to my supervisor for his guidance and constant supervision as well as for providing necessary information regarding the project and also for his support in completing the project. I would like to express my gratitude towards my parents and siblings for their kind co-operation and encouragement which helped me in the completion of this project.

My thanks and appreciations also go to my colleagues in helping me to develop the project and people who willingly helped me out with their abilities.

**CHAPTER ONE**

**1.0 INTRODUCTION**

In recent years, information technology has greatly affected all aspects of life and to a very large extent which includes political, business and day-to-day activities. However, according to study, most people spend more time on their handheld devices which can make the purchasing of products and services a lot easier since people do not have to go to retail stores directly.

Online shopping is the process where consumers directly buy goods or receive services from a vendor interactively in real-time without an intermediary service over the internet. In the instance is a form of electronic commerce used for business-to-business (B2B) and business-to-consumer (B2C) transactions.

I present the design and implementation of an e-commerce system for online shopping through secured payment methods. This system improves upon the old system of purchasing products directly from retail outlets.

* 1. **BACKGROUND OF STUDY**

Internet shopping is still in evolutionary stage in Ghana and very few studies have undertaken research exploring customer acceptance and diffusion of internet shopping in Ghana. Although there has been a dearth of internet shopping related studies in Ghanaian context, theoretical exploration can be based on various international studies carried out in other countries. The online consumer market place is growing at an exponential rate. At the same time, technology has enhanced the capacity of online companies to collect, store, maintain, transfer and analyze vast amount of data from and about the consumer who visit their web sites. This increase in the collection and use of data has raised public awareness and consumer concern about online privacy.

Globally, one third of consumers prefer to do online shopping at retailers that have only an online presence as in the case of Tonaton, OLX and Jumia. 20% of customers prefer those sites that also have traditional stores whereas 16% of customers globally indicate that they have never shopped online. Almost half (47%) of online consumers indicate that they have never made online purchase. Shoppers considers online reviews and peer recommendations while researching future purchases of consumer electronics, cars and travel, and 40% of online shoppers would not even buy electronics without consulting online reviews first. t. 79% of online European consumers plan to purchase products or services via the Internet. Online reviews and opinions were most important when buying and researching cars, software and consumer electronics. Nielsen Report, (2014) found that almost half of global respondents in an online survey intend to purchase clothing or make airline or hotel reservations using an online device in the next six months. Other categories growing in prominence for online shopping include e-books, event tickets, sporting goods and toys (to name a few). Spending intentions for each have risen at a double-digit or near

double-digit percentage-point rates since 2011. The online market for buying groceries and other consumable products is comparatively smaller but is starting to show promise. While durables are the starting point of adoption, consumables are attractive due to the frequency of purchase. Aside from online purchasing, digital is an increasingly important research and engagement platform. Consumable categories are not likely reach the same level of online prominence as non-consumable categories due to the hands-on buying nature and perishability of the products, but the market is wide open and an eager audience is at the ready. Master Card Worldwide Insights, (2008) studied that internet penetration, income levels and cultural factors are key drivers of online shopping. In China and India, huge growth in online shopping is expected as income and internet penetration rise. Credit cards are preferred payment mode in online shopping, although some people prefer to pay through the infamous mobile money platform available to them by the network providers. The rising population of upper-middle income and increasing income level will probably boost the online shopping markets in China and Ghana. Forrester Research, (2012) found that Ghana’s eCommerce market is at an early stage but is expected to see huge growth over the next four to five years. Retailers have a sizeable opportunity as the online population starts to spend more and buy more frequently online. Two key areas that companies must focus on in all markets are localized payment and fulfilment options. Over the past 12 months, venture capitalists have invested heavily in Ghana’s eCommerce market, new players have emerged, and the eCommerce ecosystem has developed, presenting a huge opportunity for companies willing to work through some of the logistics and payments challenges in Ghana.

* 1. **PROBLEM STATEMENT**

The problem encountered in shopping directly from retailers over the past years include:

1. **Product Selection and Availability**

Limited to only products sold at the local level; customers cannot get different varieties with respect to brands, prices and more. Although depending on the store size, selection may be limited but this is not always the case especially for retail outlets as large as the Accra Shopping Mall for instance.

1. **Base price**

To compete with online purchasing, retail outlets are slashing down the prices of their products all around. Irrespective of that, online purchasing comes with product discounts, coupons and more.

1. **Taxes and Delivery**

Payment of local sales tax at a retail and charges for delivery of purchased items makes in-store purchasing a bit more expensive.

1. **Security**

There is always the rare case of identity theft at some level.

1. **Checkout points**

Checkout can also be very tedious. Long queues irate customers or even cashiers. Heavy push carts or baskets can be unappealing in physical retail stores.

1. **Reachability**

Shopping outlets that operate using the old system where people have to come to the shops in person to make their purchases do not always have reach more potential customers as compared to the popular e-commerce applications out there.

* 1. **AIM OF THE PROJECT**

The main aim of this project is to design and implement an e-commerce system for online shopping through secured payment methods using android and web technologies.

* 1. **OBJECTIVES OF THE STUDY**

The specific objectives of the proposed system are:

1. **Reach out to a larger market**

The main aim of this project is for the Accra mall shopping outlets to reach as many potential customers as possible in order to grow exponentially.

1. **Make online shopping services available to customers anytime**

The virtual shop remains open and operational 24 hours a day throughout the week and therefore reduces the work overload

1. **Make secured payments**

Allow users to checkout purchased items using secured payment platforms including the various mobile money platforms available and credit cards.

* 1. **SCOPE**

The system will only consider the Accra Shopping Mall. The android application will be used by University of Ghana’s Computer Science final year students. The system will not accept payment via credit cards and ATM cards.

* 1. **LIMITATIONS OF THE SYSTEM**

Mobile devices which support Android Operating System 5 (Lollipop = API 21) will be able to use this system. The system does not handle the shipping and delivery of the purchased items; the system only accepts purchase orders and notifies the customer of his shipping or delivery details.

* 1. **PROPOSED SYSTEM**

With the implementation of the E-Commerce System, customers will use their mobile devices to view, order and pay for products they desire from a variety of brands and prices. This information wil be used by the staff on the web portal to manage those orders and track customers’ location in order to make prompt deliveries. The system will have a knowledge base maintained and updated by an expert in the form of a retail administrator. From the knowledge base, product details and other relevant details will be made available to all customers.

The system will also make available to the sales and delivery team, all purchase and delivery locations through the web portal. The information will be stored in **Google’s Cloud Firestore** while the expect web portal will be developed using the combination of **JavaScript, Html** and **CSS.** The customer portal will be developed using **Kotlin, Java** and **XML.**

The system will send information through push notifications from the web portal to the customer’s handset.

The minimum requirements and functionalities required by the target device include:

1. **Android platform (Client side)**
2. Android API Level 21 (Lollipop devices and above)
3. 512 MB Device memory (RAM) or higher
4. Google Play services 12.0.1 or newer
5. Support for GPS (Global Positioning System)
6. Chrome Web browser with support for HTML5
7. **Web platform (Administrator side)**
8. Operating System (Linux, Windows, MacOS etc)
9. 1024 MB RAM or higher
10. Chrome Web Browser or any browser with support for HTML5

**CHAPTER TWO**

**2.1 LITERATURE REVIEW**

**2.1.1 INTRODUCTION**

Michal Pilik, (2012) examined that online buying behavior is affected by various factors like, economic factors, demographic factors, technical factors, social factors, cultural factors, psychological factors, marketing factors and legislative factors. Customers choose an online-shop mainly based on references, clarity and menu navigation, terms of delivery, graphic design and additional services. Complicated customers read discussions on the Internet before they spend their money online and when customers are unable to find the product quickly and easily they leave the online-shop. Dibb et al., (2001), Jobber, (2001), Kotler, (2003) described Consumer buying process as learning, information-processing and decision-making activity divided in several consequent steps: Problem identification, Information search, Alternatives evaluation, Purchasing decision, Post-purchase behavior. Efthymios Constantinides, (2004) identified the main constituents of the online experience as follows: the functionality of the Web site that includes the elements dealing with the site’s usability and interactivity, the psychological elements intended for lowering the customer’s uncertainty by communicating trust and credibility of the online vendor and Web site and the content elements including the aesthetic aspects of the online presentation and the marketing mix. Usability and trust are the issues more frequently found to influence the online consumer’s behavior. Karayanni, (2003) examined that in discriminating of potential determinants between web- shoppers and non-shoppers, the most major discriminant variable between them was found to be web- shopping motives concerning time efficiency, availability of shopping on 24 hours basis and long queues avoidance.

Lack of trust to web shopping affects negatively web shopping behavior. Bosnjak et al., (2007) noticed that neuroticism, openness to experiences, and agreeableness has small, but significant influences on the willingness to buy online. Need for Cognition has a direct negative effect towards willingness to online purchase. Lack of online shopping experience could emphasize the effects of personality traits on the estimation of likelihood of future online purchases. They implied that the decision to shop online is made with emotion rather than reasoning. Lee, (2009) augmented that quality of online reviews has a positive effect on the purchasing intention of online shoppers. Attitudes of online consumers increase with the number of reviews.

Large number of reviews is perceived as an indication of product popularity and hence increases the purchasing intention of consumers. Kim et al., (2002) studied that significant factors affecting the intention towards shopping on the internet are convenient and dependable shopping, reliability of retailer, additional information and product perception. Online Shopping Customer Experience Study, (2012) stated that satisfaction of online consumers can be improved by improving their satisfaction related to shipping and returns. Free shipping is a great motivator, drawing shoppers back to sites to make repeat purchases and causing shoppers to recommend an online retailer, consumers are willing to pay a nominal fee for getting their product faster. While comparison shopping, consumers take product price and shipping charges almost equally into consideration. There are several other things that retailers can do to improve the experience for their online shoppers. The first is to communicate the expected delivery date of the order, customers are willing to wait for their orders but want to know just how long that might be.

Timely arrival of shipments or deliveries encourage shoppers to recommend an online retailer. Consumers also like having tracking updates and delivery notifications to understand when their package is arriving. Online shoppers want flexibility in their shipping, particularly the ability to give special delivery instructions or schedule a delivery time or select an alternate delivery location. Schaupp and Bélanger, (2005) added that privacy (technology factor), merchandising (product factor), and convenience (shopping factor) are three most important attributes to consumers for online satisfaction. These are followed by trust, delivery, usability, product customization, product quality, and security.

**2.2 SURVEY OF EXISTING ONLINE SHOPPING PLATFORMS**

**2.2.1 TONATON GHANA**

Tonaton Ghana is one of the largest marketplaces in this country. This platform facilitates buying and selling of new and used items alike. It also serves as a platform for searching for jobs online.

With respect to customers, Tonaton seeks to provide unrestricted services to its them. Online shopping can be accomplished without the restriction of the time and place. Due to the application of the advanced internet technology, consumers can select and purchase goods at anytime from anywhere. One instance is where Tonaton provides 24 hours services a day which can ensure that consumers achieve the process ‘choose-purchase-payment’ whenever and wherever possible. This idea solves serious problems of traditional shopping in restrictions of the shop hours and the location of business efficiently and effectively.

Tonaton Ghana has built their own search engine which can help consumers in finding the entire products and services that are for sale. Furthermore, this service helps consumers to shop around to get a good buy quickly and easily.

Compared to traditional shopping,