



Data Management Systems

Project Final Report

Due - November 29th, 2022

Group 22

Meet Patel - 100785841

Nancy Emanuel - 100657804

Nathanael Selvaraj - 100783830

Parasjeet Marwah - 100787512

Shahab Zafar - 100707245

Table of Contents

Abstract	2
Introduction	3
-Project Goals	
-Addressing Problem	
-Implementation	
Related Work	4
Main Body	
-Components of the website	
-Queries with screenshots	
-Implementation explanation	
-Relationship to course	
-Future Improvements	5
Conclusion	8
Schematics	9
Design Diagrams	10
Future Work	11
References	12
Appendix	13

Abstract

This report focuses on the development of our online application, Planet Mobile, covering its design, implementation and coding process, relationship to data management principles, and final results. The purpose of this report is to provide readers with an insight into the application's development process and answer questions such as why we decided to build this application, justification of the technologies chosen to implement the application, and how we incorporated and used our knowledge of data management to develop our application. The methodology used to develop this application required us to utilize our knowledge from the data management course and other relevant courses to incorporate the use of HTML, CSS, MySQL, PHP, Javascript, Bootstrap to develop this application's features and various components. The purpose of our Planet Mobile application is to provide users with a one stop shop for all their mobile shopping needs at a competitive price in comparison to other leading mobile resellers. Customers will be able to choose from a variety of smartphones, prepaid phones, and mobile accessories from the comfort of their homes using our online application.

History of Problem Domain

Mobile marketing is the practise of promoting your business to mobile device consumers. When done correctly, mobile marketing gives clients or potential customers utilizing smartphones with customized, time- and location-sensitive information, allowing them to obtain what they need exactly when they need it, even if they're on the go [3]. Mobile is the future of marketing, but the age of mobile is already here. You're already behind if you haven't implemented a mobile marketing plan! According to stats by "ComScore", more consumers are spending more time engaged with mobile devices than ever before [3]. This tendency is likely to continue in the future which forms the major reason for the choice of our topic.

Introduction

Our application Planet Mobile is an online mobile store that aims to provide customers with an expansive selection of smartphones, prepaid phones, and mobile accessories to choose from at competitive prices in comparison to other mobile resellers. Planet Mobile provides users with an accessible application that makes purchasing mobile devices simple and cost effective. Our application seeks to save customers both time and money by offering a reliable online application with a smooth user experience to allow customers to easily browse through and purchase our smartphones and accessories. The main goal of the Planet Mobile application was to create a real life application which implemented data management concepts learnt from the course to provide users with a one stop shop for all their mobile purchasing needs. Also, this application guarantees that any user can buy the perfect smartphone for them with plenty of information available with a quick and easy user interface.

The project was split into three phases, idea and concepts, design and construction of the application and finally the implementation. In the first phase, our ideas and plans were outlined in a proposal which was the layering foundation. Next, in the second phase our ideas were transformed into defining properties for our database through relational schemas and ER diagrams. Finally, the design was implemented through the use of PHP and MySQL which was mainly used as the backend of the application while HTML, CSS, Javascript were used for the frontend.

The following report will provide an in-depth analysis of the Planet Mobile application developed, the goal of the application, and its relation to the course and data management concepts/principles. The report will address relation to other work, the process of choosing and justifying the technologies/coding languages utilized for our application, the design and coding processes, and the final analysis and results of our application.

Related Work

There are a multitude of competing mobile retailers in the mobile market such as Koodo, and Fido. Koodo and Fido are both Canadian wireless service providers who also offer a large variety of mobile devices to choose from including Apple, and Samsung devices on both online sites, and in-person locations [1]. These mobile retailers operate on a phone and plan basis, meaning that customers who wish to purchase mobile devices from these retailers must also choose an applicable phone plan with that wireless service provider [1]. These mobile retailers also offer prepaid phones but of a very limited selection of older phone models [1]. In terms of promotions, select phones only such as a Samsung Galaxy S21 FE with Fido are on a special promotion where customers are offered bill credits, and \$0.00 down up front [2]. Customers who are already with these providers previously are often offered exclusive offers that are not available to the general public [1]. In terms of these retailers online applications, both online applications also feature a homepage listing the mobile devices available for purchase, a login and checkout system, a shop tab listing phones, plans, promotions, and a self service tab [2].

A number of factors differentiate Planet Mobile from these mobile retailers in terms of both our online application's features, and business practices. At Planet Mobile our primary goal is to ensure our customers get the best possible deals in comparison to other online mobile sellers in the market. In order to achieve this we have a number of special promotions for customers not offered at the previously mentioned mobile retailers. At Planet Mobile, we offer student discounts of 20% off smartphone purchases and 15% off prepaid phones and accessories for university and college students. This discount sets us apart existing mobile retailers by catering to a specific customer population. We also offer a bonus discount on a customer's next purchase along with a free accessory after they spend a particular amount on their initial purchase. These discounts and our other business practices such as our 0% interest financing sets us apart from other leading mobile retailers such as Koodo, and Fido.

Another aspect that differentiates us from our competitors is our Planet Mobile online application's features. Our online application is unique in the sense that it not only offers a homepage listing the mobile devices available for purchase, and a login and checkout system, but also a number of special tabs. These special tabs allow customers to view specific statistics such as the most recent purchases made on our website, and the current hottest items to purchase so customers can view what the most popular devices our online store has to offer are.

Main Body

Components of the Website

The major components of the website include a homepage, about page, signup, login, checkout and a contact form. The homepage features a sleek navigation bar with links to the other pages, captivating animations and videos styled using CSS, buttons leading to the product pages and various data views such as recent purchases. The about page provides a background on Planet Mobile and displays what services and products we offer. The about page also features a Google map API displaying the in store location of Planet Mobile. The sign up page allows users to register and create an account in our system, and provides their account with a unique ID. Sensitive information such as their password, home address and email are stored into the database and is not visible to the public. The login page then allows registered users to access our system and makes purchases with their account. An account is required to make any purchases. The checkout page allows registered users to purchase a product, either using a credit or debit card. Once the purchase successfully goes through, the user will be taken to a page where they can view a generated invoice of their purchase. Finally, the contact form is a page where users can contact the Planet Mobile head office for any inquiries through a short message.

Queries with screenshots

iPhone 12
1,000\$
Advanced dual-camera system 12MP Main Ultra Wide Autofocus on TrueDepth front camera

iPhone 13
1,300\$
Ceramic Shield front Glass back and aluminum design

iPhone 14
1,500\$
Super Retina XDR display ProMotion technology Always-On display

Model	Brand	Price	Description	Processor	RAM	ROM	Battery	OS
iPhone 13	Apple	1420	iPhone 13 featuring a dual 12mp camera system, and a A15 bionic chip	A15 Bionic processor	4GB	256GB	Lithium-Ion battery	iOS 16.1
iPhone 13	Apple	1740	iPhone 13 pro featuring a dual 12mp camera system, and a A15 bionic chip	A15 Bionic processor	6GB	256GB	Lithium-Ion battery	iOS 16.1

Shipping Information

First Name: _____ Last Name: _____

Payment Information

Cardholder Name: (If it appears on the card): _____

Card Number: _____ Card Security Number (CVV): _____ I would like to finance my payment

Submit

Success! Thank you for choosing Planet Mobile

First Name	Last Name	Email	Payment Date	Invoice ID	Order ID	Method of Payment	Total
John	Patel	jp@gmail.com	2022/11/30	10007	1	Credit	\$100

Sign in

Email: _____

Password: _____

Create an account

Welcome back!
ID: 12378
Name: Jay Patel
Email: jp@gmail.com

Contact Form

First Name: _____
Meet _____

Last Name: _____
Patel _____

Email: _____
patelmeet12378@gmail.com _____

Message:
Hello, Demo Message!

The Screenshots for the queries of the remaining views are stored in Github (link attached in appendix[1])

Implementation explanation

For the server side programming, our application used MySQL as the database language with the help of PHP to make our website more dynamic and interactive. The reason we chose to use this framework is because it is both simple and dependable for our use cases. Connecting to the database and executing queries was easier through PHP because most group members were familiar with this scripting language. MySQL is globally used for databases which makes it more secure and reliable compared to other alternatives and is compatible with numerous internet browsers such as Chrome, Firefox and Microsoft Edge on various devices.

Relationship to course

In order to develop this application, we relied upon key principles and concepts learnt from the data management course. The concepts learnt in this course were key to the development of the server side of our application. We built a relational database formatted in MySQL to store customer information, order details, inventory information, and more. We made sure that each product, order, and customer had a unique ID. To create our relational database containing the required tables, we developed and ran a SQL query in MySQL workbench to create the necessary tables. This SQL query was developed utilizing knowledge from the course on basic SQL which covered how to create tables, specify data types, set attribute constraints, attribute defaults, key and referential integrity constraints. PHP was then utilized to connect to our database and execute SQL queries to store user registration information, and display various data views. These data views our application features were developed by utilizing knowledge covered in the data management course on complex SQL queries, and views. The concepts utilized included nested queries, joins, and aggregate functions.

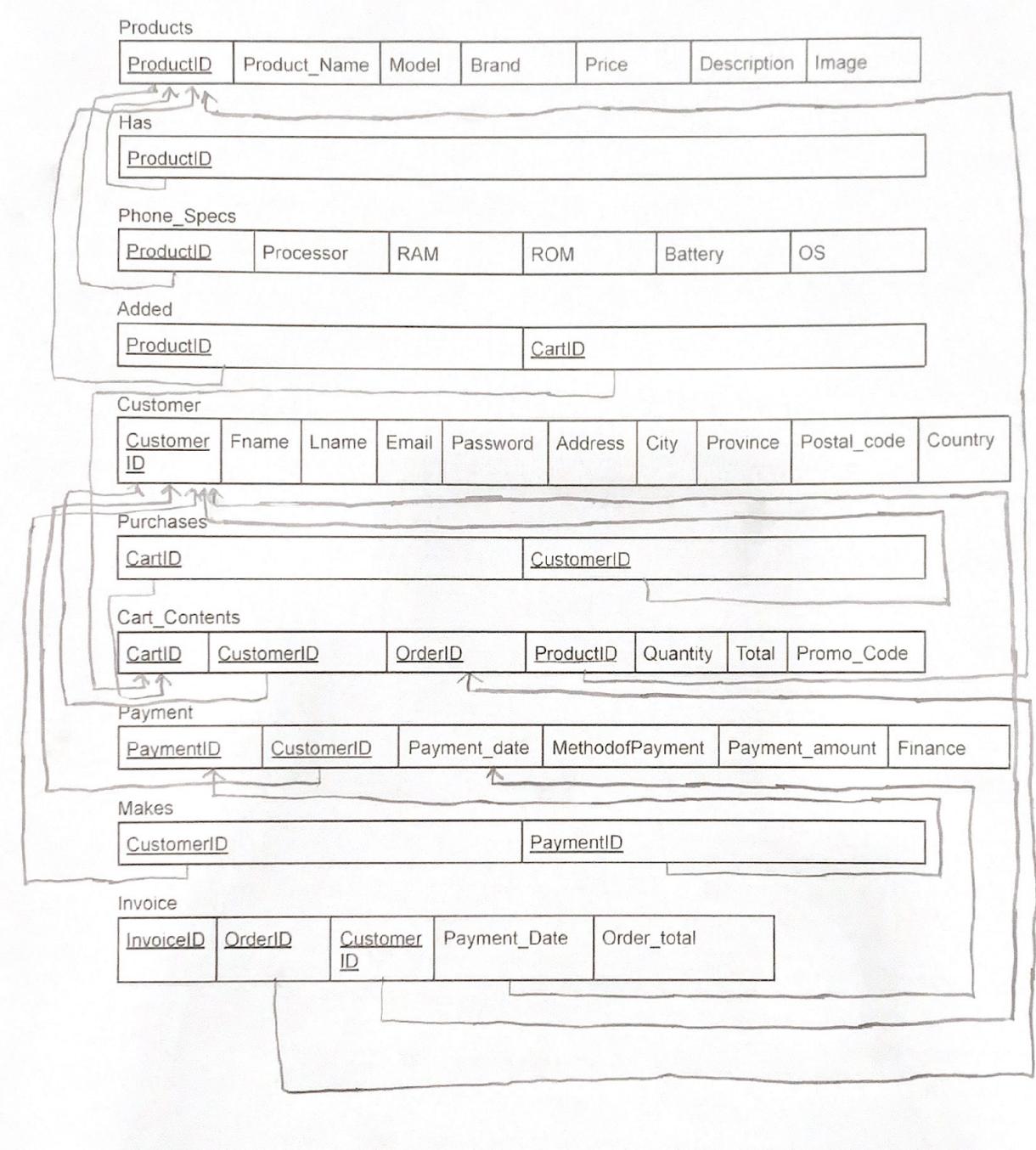
Conclusion

Our application Planet Mobile was developed with the goal of utilizing our data management knowledge to develop a real life application that acts as an online mobile retailer. Planet Mobile consists of a simple to navigate user interface that allows customers to browse and order mobile devices and accessories from the comfort of their homes. Planet Mobile differentiated itself from its competitors by aiming to provide our customers with competitive discounts, along with other business strategies such as our 0% interest financing, distinguishing us from other prominent technology companies like Apple and Samsung. Our team was able to achieve our end goal of developing a functional mobile selling platform incorporating concepts from our data management course.

Contribution Matrix

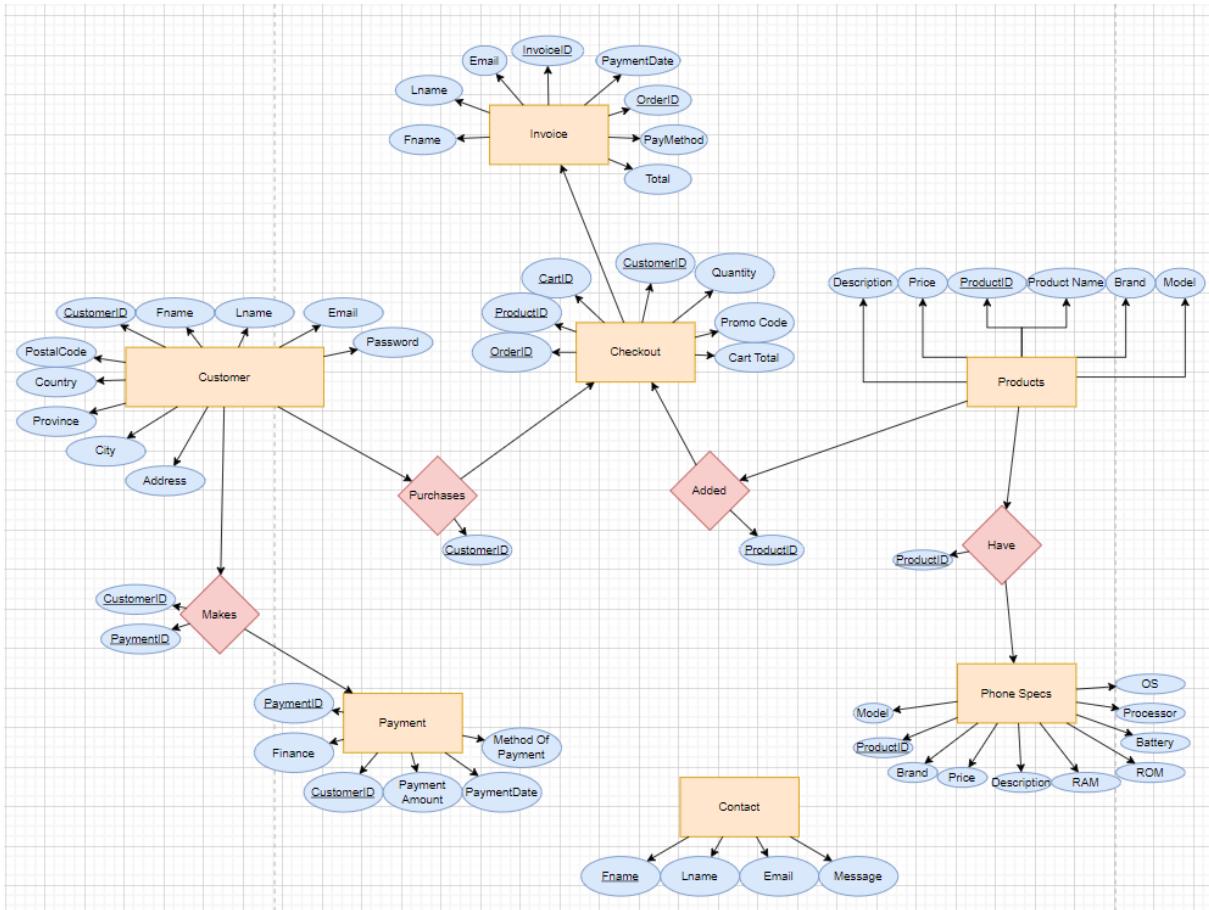
	Parasjeet Marwah	Nathanael Selvaraj	Shahab Zafar	Meet Patel	Nancy Emanuel
Assigned Task	Database creation, maintenance, PHP code, queries and report writing	Report Writing, Interface Layout, API, CSS maintenance	Frontend maintenance, Worked on the views, Worked on API, Report Writing	Frontend Development and maintenance, worked on creating views. Report formatting and writing	Report writing and formatting, and sample data, part C created view, CSS maintenance
Contribution Percentage	20%	20%	20%	20%	20%

Schematics

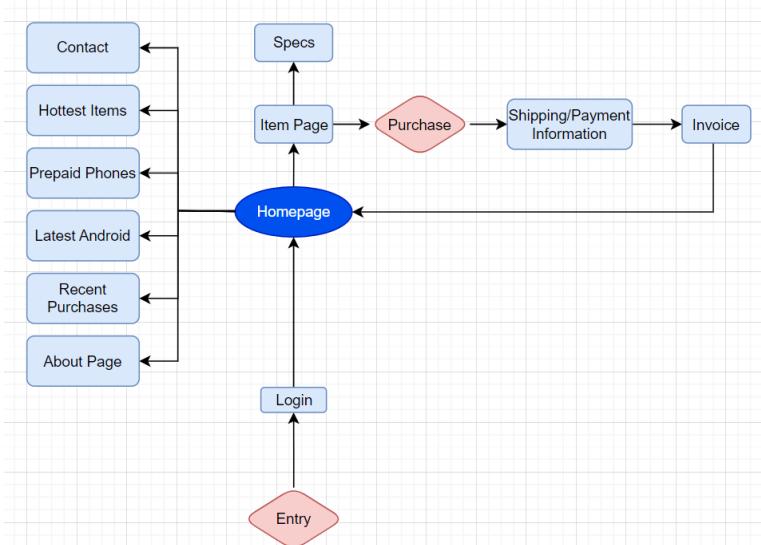


Design Diagrams

ER - Diagram



UI Diagram



Future Work

There were two different aspects that we as an online mobile selling platform focused on. The first aspect was the ‘technical’ aspect which involved the functionality and navigation of our website that the user interacts with. From the developers end, this meant linking the applications back end with its front end framework to display a user friendly display for our end users. The second aspect we focused on was the ‘business’ aspect. The business aspect focused on ensuring that our website sold products that were reasonable in price, sleek in quality and adequate in terms of the demands of our customers. We were able to incorporate the majority of elements in our project needed to function our phone selling web application. However, despite the fact that the database and web pages we have created meet the requirement we initially set and provide the user with the ability to buy phones and accessories, there are still multiple improvements that can be made to the application as a whole. Firstly, we tried implementing an “add to cart” system to our web page that was going to deploy in depth JavaScript coding but couldn’t finish it due to technical issues. Although we do plan to get that feature functioning as it forms an integral part of an online shopping website since it lets the customer see their bought products and its prices before proceeding to checkout. Secondly, we aimed to integrate a phone web based API that was going to show the top trending phones from our website in terms of the products sold. This is what we wish to embed on our website from a known external database in future. As of now, A user is able to purchase one product at a time, however with the implementation of a cart system users would be able to add many products to their cart and proceed to checkout when they’re satisfied.

From a business perspective we will be trying to bring more discounts and deals for our customers, especially customers like students and old customers. Another improvement from a business perspective would be to implement an AI chat service to help customers with quick questions and inquiries. This feature would save time on the users end for asking quick questions instead of having to wait for an email response from the contact form. Another feature we wished to implement would be a tracking feature, a feature for users to track the products they purchased from the date it was shipped.

References

- [1] “Default homepage,” *Koodo Mobile | Home*. [Online]. Available: https://www.koodomobile.com/en?CMP=KNCKDO0428Google_Koodo-ROI_Google_634943852856&utm_source=google&utm_medium=cpc&utm_campaign=Koodo-ROI&utm_content=634943852856&gclid=CjwKCAiAyfybBhBKEiwAgtB7fge1uFiMreN6O37x2FPo_UJ4C18VSCz4ZovQqADbaMDXM2xzf3HnBoC510QAvD_BwE&gclsrc=aw.ds. [Accessed: 25-Nov-2022].
- [2] “Default homepage,” *Fido*. [Online]. Available: <https://www.fido.ca/>. [Accessed: 26-Nov-2022].
- [3] Marrs, Megan. “What Is Mobile Marketing & Why Does It Matter so Much?” *Wordstream.com*, 2013, www.wordstream.com/blog/ws/2013/08/19/what-is-mobile-marketing [Accessed: 25-Nov-2022].

Appendix

[1] GitHub Link:

<https://github.com/patelmeet1372/Planet-Mobile-Final-Project.git>