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Mobile Computing and E-Commerce

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***Abstract*- Electronic commerce and mobile computing are helpful on mobile platforms. Because mobile computing and mobile finance services use wireless electronic devices like cell phones, laptops, handheld computers, or personal computers, their enhanced capabilities are helpful for any online sales transactions. All wireless devices support interactive communication. They make purchases of goods. All cash transactions will be referred to as cash exchange on frameworks. Every website has an environmental backdrop. Determining the needs of the consumer is a crucial component in developing mobile-commerce apps. More recommendations for methods used by e-commerce and m-commerce platforms in mobile services and s-commerce interactions are provided in this study. We discuss mobile cloud computing and its more sophisticated aspects in the article. Effective electronic commerce is developed through the use of AI-based commerce and mobile cloud-based architecture.**

Keywords: ***Mobile cloud Computing, AI & m-commerce, s-commerce.***

I. INTRODUCTION

Wireless networks, mobile software, and portable hardware form the basis of mobile computing and commerce. The goal of mobile computing for e-commerce is to maximize the online buying experience for mobile consumers by utilizing a wide range of technologies, tactics, and procedures. Businesses are progressively utilizing mobile platforms, ranging from specialized mobile applications to responsive web design, to efficiently connect and interact with their intended audience. Through the use of technology, people can transfer data between devices without the need for physical connections or cords thanks to a system called mobile computing. Put differently, mobile computing refers to the ability to transmit data, speech, and video through wirelessly capable devices, like mobile phones, without the need for a connection. You can only view and transmit data from remote areas without physically being there thanks to mobile computing technologies. A wide communication coverage area is offered by mobile computing technology. It is among the most dependable and swiftly growing areas of computer technology.

II. MOBILE COMMERCE

Mobile commerce (m-commerce) refers to the conduct of business using wireless devices and communications. Driven by the success of e-commerce and impressive progress in wireless technologies, m-commerce is rapidly taking place in the business activity. M-commerce provides applications to access user's data. Using one of several connecting technologies, the new data are transmitted from device to site's information system for processing. Then the files are updated and the new data are accessible to other system user. The mobile computing and commerce environment relies on two basic approaches to Internet connectivity: short-range wireless technologies such as Wi-Fi and longer-range telecommunications technologies like 4G and 5G, Wi-MAX networks. Mobile commerce B2C apps are expanding in several areas-retail shopping for products and services, mobile entertainment, mobile gaming, travel and hospital services.

Smartphones provides Location-based commerce to the delivery of advertisements, products, information, or services to customers whose locations are known at a given time. M-commerce allows businesses to reach more customers online and provides customers with a wide range of product choices and payment options from different vendors. It also makes it easier to compare prices of products on the same platform and access customer reviews. M-commerce automates a business's point of customer contact and sales with a variety of mobile contactless payment options, such as Apple Pay, PayPal, one touch and Visa Checkout. Many e-commerce sites also offer one-click checkout process functionality, which enables users to add payment information only once and then use the one-click option for every purchase made thereafter.

A. Types of m-commerce

1) *Mobile shopping*: It enables customers to buy a product using a mobile device with an application such as Amazon or a web app. A subcategory of mobile shopping is app commerce, which is a transaction that takes place over a native app.
2) *Mobile banking*: It is online banking designed for handheld technology. It enables customers to access accounts and brokerage services, conduct financial transactions, pay bills and make stock trades. This is typically done through a secure, dedicated app provided by the banking institution. Mobile banking services may use SMS or chatbots and other conversational app platforms to send out alerts and track account activities.

3) *Mobile payments*: These methods are an alternative to traditional payment methods, such as cash, check, credit and debit cards. They enable users to buy products in person using a mobile device. Digital wallets, such as Apple Pay, let customers buy products without swiping a card or paying with cash. Mobile consumers also use QR codes to pay for things. With mobile payments, users send money directly to the recipient's cell phone number or bank account.

III. M-COMMERCE ARCHITECTURE

Mobile commerce architecture typically includes a mobile application that serves as the interface between the user and the commerce system. User interface should support easy navigation, product browsing, search functionality, shopping cart management, and secure payment options. Database system is required to store and retrieve product information, user profiles, order history, and other relevant data. Security is paramount in mobile commerce architecture. Measures such as encryption, secure socket layers (SSL), and tokenization are employed to protect sensitive user information, including payment details. Integration with payment gateways is crucial to enable secure and seamless online payments. Many mobile commerce architectures leverage cloud computing platforms for scalability, reliability, and cost-effectiveness. Cloud infrastructure enables businesses to handle high traffic volumes, store and process data efficiently, and scale resources as needed

IV. CLOUD BASED MOBILE COMMERCE ARCHITECTURE

Mobile cloud computing (MCC) is concept that combines mobile computing and cloud computing to provide users with seamless access to data and applications over the internet. The exponential increase in the number of mobile devices has made mobile cloud computing a crucial technology for enhancing the power and capability of these devices. By using the cloud as a back-end infrastructure, mobile devices can access data and computing resources that are not available on the device itself. Two key components make up the mobile cloud computing architecture:

- The first significant component is the virtualized computing core (VC), a hosted cloud service that hosts multiple cloud computing services required to run on the mobile device.
- The client-side application (CSA), the second important component, runs the MCC apps on the host device. When executing programs on a customer's behalf, the CSA uses a cloud execution service (CES). The MCC program can leverage various cloud services while running in the CES to expand its functionalities.

V. MOBILE FINANCIAL SERVICES

Mobile financial services (MFS) combine the power of mobile communication and financial services to offer easy-to-use and secure next-generation mobile money, digital wallet, and digital payment services. From a merchant's perspective, the key selling point is the fact that all businesses want to make it as easy as possible for customers to pay. From the perspective of the companies backing mobile payments, there is the money they can earn from the payments. And there is the opportunity to gather valuable data on each customer's spending patterns. This data can then be used to inform other business decisions.

MFS includes both transactional and non-transactional services, such as viewing financial information on a user's mobile phone. MFS include services such as mobile banking (m-banking) and mobile payments (m-payments).Mobile banking is a service provided by a bank or other financial institution that allows its customers to conduct financial transactions remotely using a mobile device. Customers can easily access banking account, check balance, transfer funds, pay bills, deposit checks, etc.

A mobile payment is a money payment made for a product or service through a portable electronic device. Mobile payment systems boost the business speed and security while increasing both business and customers' convenience. M-payments provide customers with convenient options that help deliver a seamless purchasing experience. Different types of mobile payment systems are mobile wallets, mobile app payments, and mobile browser-based payments.

Fig.1. Mobile Payments

A. *Advantages:*

- ✓ Convenience and Accessibility
- ✓ Quick and Effortless Transactions
- ✓ Improves Sales and Customer Satisfaction

B. *Disadvantages:*

- ✓ Security Risks
- ✓ Charges Transaction Fees
- ✓ Not Accepted Everywhere
- ✓ Dependency on Network and Technology

VI. AI AND MOBILE COMMERCE

Artificial intelligence can help mobile commerce businesses improve the customer experience, boost sales, and optimize operations. The popularity of smartphones and mobile devices has caused a massive surge in mobile users. Artificial Intelligence has emerged as a great tool to overcome the challenges posed by the overwhelming volume of data in m-Commerce. The fusion of AI and personalization has given rise to a new era in mobile commerce. It opens up new opportunities for mobile commerce suggestions. It goes beyond generic recommendations by fully understanding user intent. With AI's ability to process vast amounts of data, it identifies subtle patterns and suggests products that align precisely with user's needs.

Augmented reality (AR) is a digital interactive experience that layers virtual and real worlds on a device screen. It often involves augmenting images or videos of real-world objects with 2D and 3D images and videos of virtual objects. These smart recommendations improve the shopping journey. AR can enhance the m-commerce experience by providing an in-store feel to online shopping.

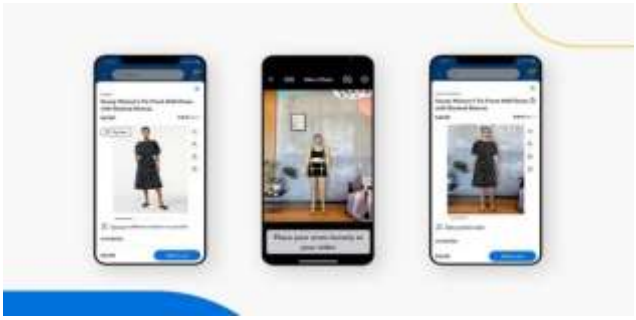

Fig.2. AR in m-commerce

AR can also be used to create virtual showrooms that allow customers to view and purchase products without having to leave their homes. By using natural language processing (NLP), chatbots can engage in human-like conversations with customers, address queries, provide assistance, and resolve issues in real time. AI-driven predictive analytics has become a true game-changer for m-Commerce businesses. By thoroughly analysing historical data and recognizing patterns, AI can now forecast customer behaviour, trends, This, in turn, will help companies optimize inventory management, develop better pricing strategies, and launch more successful marketing campaigns.AR allows ecommerce customers to preview products or experience services in their own environment and on their own time, before electing to make a purchase. Using AR, customers can preview products and be more likely to pick the right product the first time. The features of AR are

A. Virtual try-on solutions.

Virtual Try-On technology is an innovative way for customers to visualize clothes, makeup, and accessories without putting them on physically.

B. Preview placement.

Preview placement gives customers a real-time glimpse of what a product will look like when placed in their own environment. This can be useful for products like furniture, televisions, and clothing, which can be difficult to visualize in a store or on a small screen

Amazon AR View is an AR feature available in the Amazon app that allows users to view and interact with virtual 3D models of products before they buy them

C. *Interactive user manuals.*

If you're selling a product that has a learning curve before it becomes easy for new customers to use, an interactive user manual might be great AR applications for you to help users better understand how your product works. An interactive user manual responds to user actions, providing on-page contextual support when using a piece of software, website, or application. Many AR user manual apps scan the product and indicate the buttons in the real-life environment using graphical arrows and animations with text.

D. AR filters.

AR filters can also be used to create special filters that show products in entertaining ways. For example, beauty brands like Sephora and L'Oréal have AR filters that let users try on makeup virtually.

VII. S-COMMERCE

Social commerce is the process of using social media or networking websites such as Twitter, Instagram, or Facebook to promote and sell products. It refers to e-commerce transactions where buyers and sellers have a more direct connection with each other. S-Commerce model supports social interaction and user contributions and reduces the cost of overheads, operations and marketing while increasing reach and sales through the reseller network. The new paradigm of e-business utilizes online communities, user ratings, referrals and social advertising to facilitate online shopping. S-commerce helps companies engage people with their brands according to the consumer's social behaviours. It provides customers with a platform to talk about their brand on the website. An Indian-origin social commerce platform Meesho enables small businesses and individuals to start their online stores via social media channels.

Fig.3. s-commerce

VIII. CONCLUSION

In this paper, we conclude m-commerce, s-commerce are mobile computing application models based on cloud computing mass data storage. Mobile computing has fundamentally transformed the landscape of e-commerce, offering new opportunities for businesses to reach and engage with customers. However, success in mobile e-commerce requires a strategic approach that addresses both the opportunities and challenges posed by this rapidly evolving technology. The evolution of mobile commerce has been remarkable, driven by technological innovations and changing consumer preferences. The future looks promising, with advancements in AI, AR technology poised to transform the shopping experience further.

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