i-SHOP: A MODEL FOR SMART SHOPPING

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Abstract— online shopping is an easy and comfortable way of shopping from a large range of products. There are innumerable advantages of online shopping. Customers can save a lot of time which they normally need to physically go to the retail shop and buy the products that customers want. We have set up a fully functional e-commerce website that has the capacity to be extended to a smarter model by incorporating data mining to understand customer buying habits and traits to predict future trends. We have utilized a free CMS system and developed the website using MYSQL database and PHP programming language. Firstly it is a free CMS system so others can use without paying. This smart shopping model is divided into 9 modules. The Registration Module which allows users and customers to register on the i-shop website in order to use it. The Products Browse and Products Search Module allow the customers easy access to search the website for their preferred products. The Shopping cart Module which has multiple currency capability to allow customers to use the website in their preferred currency. Also implemented is the Shipping & Billing Module which allows the vendor to control the amount of shipping charges. The Payment Module allows the customer many methods to make payments. The Admin User Management, Admin Catalog Management and Admin Order Management Module allow the admin of i-shop model to manage, control and monitor the overall website in a seamless manner. Finally this study attempts to examine how a smarter shopping model will influence consumers' online shopping attitude.

Keywords— Electronic commerce, i-shop, Smart Shopping

I. INTRODUCTION

Electronic commerce is an emergent research discipline with a history of less than 20 years. The exploding growth of electronic commerce activities in the last decade has attracted significant attention from practice as well as academics in different fields. In today's world of new technology, enormous business activities are conducted online. People go online to sell and buy both goods and services, and many transactions cannot be completed without Internet technology. The following paper reflects and summarizes the various researches carried out in the field of online shopping and smart shopping models. Due to the popularity and rapid expansion of the Internet and network technology, electronic commerce has become a major activity in contemporary business operations.

The progress of the World Wide Web has increased the magnitude of online shopping activities [1]. The internet has been utilized as a vital shopping means with an increasing amount of online sales on a yearly basis[2]. Still, many internet users are reluctant to online shopping due to privacy and security concerns [3] deriving by their unwillingness to send personal data via the internet [4]. In spite of this, online shopping is continuing to grow as online enterprises become more sophisticated [3], which results in the dramatic change of how consumers buy products and services [1]. Wu [5] mentions that approximately half the internet users have purchased a product or service via the internet and according to Li and Zhang [6] online shopping is the third most popular internet activity. The most recent global report shows that global online retail sales grew by 14.5% in 2009 to reach $348.6 billion, which yet only accounts for 2.5% of the total global retail sales. By 2014 global online retail sales are expected to reach $778.6 billion, increasing at a 22.2%. IMAP retail report Research from the GfK Group [7] shows that the number of online shoppers in six key European markets has raised to 31.4 percent from 27.7 percent last year. This means that 59 million Europeans use the Internet regularly for shopping purposes. However, not only does the number of online shoppers grow, the volume of their purchases also increases over-proportionally. American, online retail sales of 2009 boosted by 2.1% over 2008, getting a total of $145 billion dollars, and from 2002 to 2009 retail electronic-sales increased on average annual growth rate of 18.1% [8].In the EU of the 27 members, 37% of the internet users have made an online purchase in 2009, a 5% increase over the previous year. In the United Kingdom, Denmark, the Netherlands, Norway and Sweden more than 60% of the internet users have made an online purchase, whereas the equivalent number in Greece, Lithuania, Bulgaria and Romania is less than 10% [9]. Many studies have been conducted about online consumer behavior. Most of them have tried to identify factors that affect or contribute to online consumer behavior. Researchers seem to adopt different points of view and focus on different factors in different ways [6].In a research carried out by Pérez-Hernández and Sánchez-Mangas [10] it was found that having an internet connection at home increases the individual's probability to shop online up to 14%. Li and Zhang [6], during their research for consumer characteristics related to online shopping, found that consumers who shop online seek convenience and variety. Moreover, they are more innovative and spontaneous than conventional buyers. Also they are less aware of the brand of the product and tend to have a more positive attitude towards advertising and direct marketing. On the other hand, Siu and Cheng [11] found that the most important factors in classifying online shoppers are the economic benefits that derive from online shopping, the product availability, the security dangers, their monthly

income, the product technology opinion leaders and their attitude towards technological development. The level of trust had a positive relationship to the attitude towards the shop and a negative relationship towards perceived risk. Finally, attitude and risk perception affected consumer intention to buy from a specific store [12].As it can be inferred from the above, the size of online shopping adoption varies between the developed and developing countries [13]. Understanding the opportunities this new market has to offer is crucial for any business that wants to participate in it and be competitive. Moreover, online consumer attitude is an issue that concerns many researchers [14]. An essential question in this area is, which are the factors that determine consumers' decision to make a purchase from a certain electronic shop [15]. Liang and Huang [16] showed that different products types affect consumers' acceptance of online shopping. Cho [17] supported that the purchasing behavior of customers in online markets depends on what product or service they have in mind. In today's world, Ecommerce can be a very rewarding venture; however it is vital for more research and questions as there is a need for smarter models and methods of shopping as ecommerce takes over. This research is filling the gaps on this above issue by putting forward a smarter model of web based commerce solution. Although many studies have shown that consumer characteristics are important when it comes to online shopping, majority of those ignore the effect of ease of online shopping. Wanting to overcome this limitation, the aim of this study is to examine how a smarter shopping model will influence consumers' online shopping attitude.

The organization of this paper is as follows, Section 2 presents theoretical background of this study. Section 3 presents the research question and Section 4 presents the i-shop proposed model. Finally we are going to conclude this research in the conclusion Section by leaving the future scopes for novice researchers.

II. THEORETICAL BACKGROUND

The World Wide Web is developing fast and while its popularity is growing, more and more users become familiar with it and adopt it as a medium to search for information and shop online [1]. These section summaries the determinants that construct the consumer behavior, the factors that determine the user acceptance of online shopping and a brief review of previously conducted researches concerning the aforementioned.

Determinants of Consumer Behavior

Consumer behavior is affected by four categories of factors: cultural factors, social factors, personal factors and psychological factors. The first category of cultural factors includes terms like culture, subculture and social class [5]. The term culture is complex and involves the knowledge, beliefs, arts, laws, ethics, customs and many other abilities and habits that are obtained by an individual just by being part of the society [18].The second category refers to social factors and includes reference groups, family, social roles and social status [5]. Reference groups involve all those groups that have a direct (personal) or indirect influence on the attitude or behavior of an individual [12]. Family is considered the most significant social factor and has been widely examined. The third category, the personal factors, include: age and life circle stage, occupation, economic situation, lifestyle, personality and self-concept [12]. People change their likes in products or services according to their age. Moreover, their purchases are formed throughout their life circle stages which are the phases the families go through while they develop and mature over time [12]. A person's occupation is another factor that influences one's buying behavior. The fourth category consists of psychological factors like motivation, perception, learning, beliefs and attitudes [12]. Motivation is an internal and complex process which influences people's behavior and is caused by particular motives such as hunger, thirst, recognition and devotion.

Factors determining user acceptance of online shopping

Previous studies have defined four main factors of user acceptance of online shopping: consumer characteristics, personal perceived values, website design and product. Consumer characteristics involve personality traits like the knowledge of the internet and the social environment [6], self-efficacy which refers to one's belief of his /her ability and means to successfully complete a certain action [6], demographic profile which contains variables like age, gender, education and income [6], and last acceptance of new IT applications which refers to the user's attitude towards the adoption of IT [12].

Factors Affecting Consumers' Online Shopping Attitude

Previous studies have summarized several significant factors that could influence consumers' attitude towards online shopping, such as usability, security, after-sales service and reputation.

2.1   Perceived Usability

Usability refers to the extent to which a website facilitates users to utilize its functions easily and appropriately [12]. Web usability can be defined as making the design simple enough so that customers, who by nature tend to be goal-driven, can accomplish their task as quickly and painlessly as possible.

2.2   Perceived Security

Pearson [19] defined perceived security on the Web as "the extent to which one believes that the World Wide Web is secure for transmitting sensitive information". According to their studies, they believed that purchase intention online was influenced by the security of e-transactions.

2.3 Perceived After-sales Service Quality

The definition of 'After-sales Service' is the delivery service for sending products to a customer after payment, technical support after sales, etc. [19]. The maintenance of the sold-out products such as repairs, returns, and replacements are the service that is categorized as unanticipated service.

2.4 Perceived Reputation

Hyde and Gosschalk [20] defined the role of reputation in the virtual environment is more important than the traditional market environment. In the virtual environment, consumers cannot directly examine the goods before they purchase. They can only obtain the information about the product from the website and trust the product description of vendor. Therefore, the reputation of online vendor has become a significant factor that influences consumers' attitude towards online shopping.

III. RESEARCH QUESTION

The current trend of online shopping has been shown in the previous sections. As the whole process of online purchase is via the Internet, in the virtual environment, there are many factors that are tough for online consumers to control, such as online security, privacy protection, and after-sales service. Many people believe that these problems could directly influence their attitude in adopting online shopping. People also believe that it is too complicated to process online shopping and that it is impossible to physically check the quality of the merchandise. Moreover, fraud has also become a serious issue that has discouraged e-consumers.

Thus, the research question of this study is shown as follows: What is the level of consumers' satisfaction and attitude towards a new and smarter shopping model referred to as "i-shop a Model for smart shopping?"The goal of this research is to introduce a new and smarter shopping model referred to as "i-shop a Model for smart shopping".

IV. MODULES IMPLEMENTION

The system after careful analysis has been identified to be presented with the following modules. This smart shopping model is divided into 9 modules (www.ilab-australia.org/ishop2016/). The Registration Module which allows users and customers to register on the i-shop website in order to use it. The Products Browse and Products Search Module allow the customers easy access to search the website for their preferred products. The Shopping cart Module which has multiple currency capability to allow customers to use the website in their preferred currency. Also implemented is the Shipping & Billing Module which allows the vendor to control the amount of shipping charges. The Payment Module allows the customer many methods to make payments. The Admin User Management, Admin Catalog Management and Admin Order Management Module allow the admin of i-shop model

to manage, control and monitor the overall website in a seamless manner.

V. PROPOSED MODEL

A new and smarter shopping model was developed for a better online shopping experience. Following illustration plays a vital role in the development life cycle (SDLC) as it describes the complete requirement of the system. It is meant for use by developers who wish to further enhance the new system.

All requirements were known beforehand and the objective of this software development is design and development of online shopping which will enable customers to perform their normal household shopping via internet. Figure 1 introduces our proposed i-shop model system development life cycle.
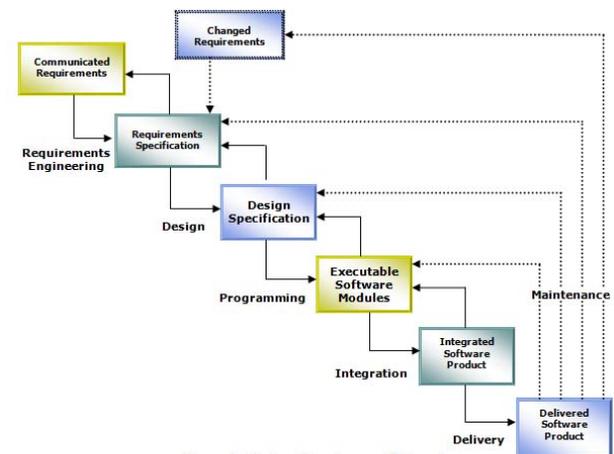
Figure 1: System Development Lifecycle
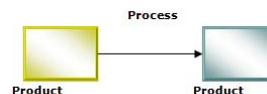
VI. ADVANCED SYSTEM CAPABILITIES

There are quite a few advanced capabilities that i-shop provides to the vendors. The ability to update customer records, the ability to view and update order status. The status of orders can be changed, from 'pending' to 'delivered' for example, and comments can be added. The status and comments associated with an order can be optionally emailed to the customer directly from the Administration area or made viewable in the customer's "My Account" area. Control over the addition, removal and modification of categories, products, manufacturers, customers, and product reviews. The system also allows control over the shop's catalog structure and reviewing reports on both customers and their purchases. Some other important characteristics that i-shop provides are control over how shipping costs are calculated for each purchase and control over the way payments are processed.

Multiple payment methods can be installed, giving customers a choice of payment options. Support for multi-language sites and multi-currency shops and the ability to update exchange rates manually or via connection to currency exchange rate servers. i-shop also has good backup tools to safeguard the store's data from computer failures. Some features for customers to make the task of shopping and tracking past purchases easy are also implements in the i-shop. Purchases can be reviewed by customers so that they can track and monitor the status of their orders. Customers can view the status of each order. The software provides the customer with detailed information regarding their order, including whether their order has been processed or shipped. Customers have access to their full history of purchases allowing them to track back through their past purchases. Moreover customers can register to receive email notification of product updates relevant to them. An optional product review feature (which can be disabled by the shop owner) allows customers to review products and read the reviews of other shoppers. Customers also have the option to tell a friend about our product via email.

VII. I-SHOP STATE TRANSITION DIAGRAM

Fig. 2 below shows the state transition diagram of proposed i-shop model. The state transition diagram gives an abstract description of the behavior of i-shop system. This behavior is analyzed and represented as a series of events that can occur in one or more possible states.
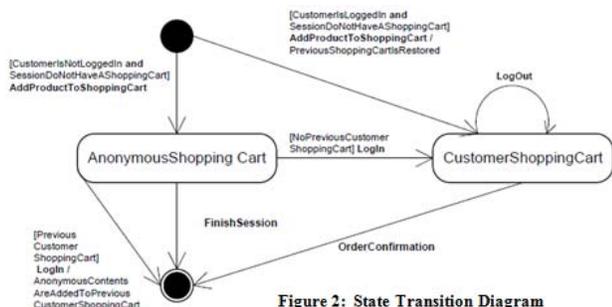
Figure 2: State Transition Diagram

VIII. I-SHOP DATA FLOW DIAGRAM

Fig. 3 below shows the Data flow diagram of proposed i-shop model. It is a graphical representation of the "flow" of data through the i-shop system, modeling its process aspects. This DFD shows what kind of information will be input to and output from the system, where the data will come from and go to, and where the data will be stored.
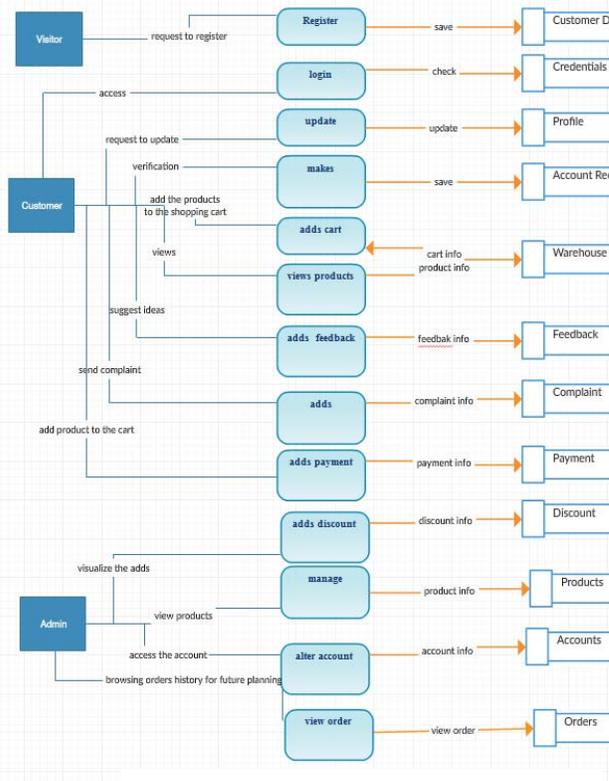
Figure 3: Data Flow Diagram

IX. CONCLUSIONS

This research represented the first phase of a research plan intended ultimately to identify and measure the consumer experiences and web based attributes that are associated with quality and satisfaction of the new and smarter shopping model developed. Additionally, website design and strategy issues should be based on motivations and satisfiers for online buyers. For example, online buyers largely do not expect or desire "high touch" service unless they have questions or problems with customer service, in which case they expect relatively speedy answers (within 24 hours)responsive to their individual problems. Any features that increase the sense of user control and freedom, including order tracking, purchase

histories, saving information to facilitate speed in future sessions, and opt-in email notification of new products and special deals, increase the satisfaction of goal-oriented users. This model has few attractive options, for instance a consumer can go economic mode or brand mode to finalize his order in a quickly manner. This system would generate all the available data about customers, products, daily transaction etc. From there we can employ computational Intelligence Theory to extract knowledge through big data. "Big data" is a key concept that almost everyone has encountered by now. But in the E-commerce world, a vast number of businesses have not yet fully immersed themselves in the use of this big data to furnish key insights and generate profitable adjustments.

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