

E-commerce Personalization for Local Music Instruments Market in Sri Lanka

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Abstract: The internet is the most important part of all the people who are living around the world because they can search anything through the internet, and it gives many kinds of conveniences to human lives. Ecommerce web applications are one of the most important technology for information, services, buying items, and selling items over the Internet today. So, it is a more powerful technology in the modern world rather than traditional commerce. The main objective of this research paper is to point out the difficulties of a small-scale business (local musical instruments business) and give a technical solution to maximize their profit and business opportunities. Under this research has been identified the major problems of that business and this is a little effort to develop their business with the concept of personalization which can be used as a business strategy. The personalization aims at satisfying the customer needs and it provides original and innovative research on business information systems. The customized market and product categories provide a comprehensive investigation of the business processes to receive the maximum output of the business. Hence, this solution may be a huge advantage to bloom the local music instruments industry in Sri Lanka.

Keywords: Internet, E-Commerce, Personalization

Introduction

E-commerce, also known as internet commerce or electronic commerce, means the purchase and sale of goods and services that use the Internet and the transfer of data and money to perform the transactions. It is often used to sell different types of physical products over the Internet. Also, it describes any type of commercial transaction which is facilitated by the Internet. During this period, the thought of living without e-commerce seems very complicated. There are thousands of new technologies and innovations that are entering the Internet market every day. Here, the research helps to solve the problems of a musical instruments shop in Piliyandala, Sri Lanka (Sri Sarasavi Musical Instruments Piliyandala) which can be defined as a small-scale business. Hence the main objective is to give an e-commerce-based solution for their major problems and major impacts that were found during the research. Sri Sarasavi Musical Instruments Shop is the only local musical instrument shop located in the Piliyandala area. And also, it is one of the best local music instruments shops in Sri Lanka which designs high-quality musical instruments. It was found that they have well experienced

best drum designers who do a great job for the enhancement of the Sri Lankan music industry. The main challenges are that they often have limited resources in respect of stores (space constraints), raw materials, time, and finances. Ecommerce is the most suitable solution for their major problems

because it helps to reduce the operational costs and costs of running the business. Today musical instruments and the supply industry is at a major turning point. With the emergence of the Internet and its accessibility, the music business has grown exponentially. Some of the expected benefits from e-commerce in the music businesses are integrated into business cycles, improved customer interactions, larger purchases per transaction, a larger number of buyers, a larger number of vendors, and lower transaction costs of doing businesses. The purchasing decisions in the music industry are based on people's feelings and passion. Therefore, people seek special research and advice before purchasing many instruments.

The most successful e-commerce businesses do not optimize every single metric available. The personalization is a particular metric in e-commerce right now. It can be defined as the proactive of creating personal interactions based on the experiences of e-commerce sites. Hence the concept of personalization has been used here to customers feel special and improve their purchasing experiences.

Literature Review

A. E-commerce and music industry

E-commerce is becoming a blossoming research field because of IT infrastructure, mobile communication, and high penetration of the internet. It is a peaceful investment for businesses, where growth is expected to increase as the overall market grows. E-commerce is mainly related to the online transactions of buying and selling goods and services. Today different types of applications are available and there is no time or a geographic scope limitation.^[1] It has become a major part of all types of business scenarios and it has been adopted by nearly all industries.^[1] There are so many indications happening in the music industry in different countries because of e-commerce

technology.^[2] As an example, the United States of America is a top country that use e-commerce technology to grow the music industry and many consumers buy different types of music items and services via e-commerce websites.^[2] Under this research that one of the main targets applies the e-commerce concepts and technology to build up the local music industry in Sri Lanka with high-quality products though it is a small scale business.

B. Small scale businesses and online marketplace

The field of small businesses has a huge impact on the economy of a country especially in a developing country like Sri Lanka.^[3] Because a small scale industry is a very important part of the industrial background of a country and it may cause to employment generator segment of the economy.^[4] It can be considered as the backbone of the economy in all the countries.^[4] The online marketplace initially levelled the playing field for small-scale businesses and it has succeeded in creating an environment whereby social recommendations can impact customer choices whilst remaining relatively anonymous.^[5] Also, the e-commerce lowers transaction costs that formerly served as a barrier to entry in local markets. It enables consumers to become aware of and transact with electronic retailers who may be located anywhere in the world.^[5] E-commerce is getting all the more broadly open and less expensive to work.

C. E-commerce Personalization

E-commerce websites personalize customer experience to encourage them to purchase goods and services from different platforms as they prefer.^[6] Its mission is to enhance the shopping experience of users by adapting the visual and interactive design features of e-commerce web environments based on user cognitive processing features.^[7] There are

several benefits to using personalization methods for e-commerce systems. [6] Research has shown that concept plays an important role in how people use technology and in the persuasion strategies they prefer. [6] For example, such a system can learn from a customer and recommend personalized products that the customer may want. Because of more and more product information being posted online, the excessive amount of information now makes it difficult for consumers to make their choices. [8] Consumers may feel lost when they search for large product information available and may be turned away from the business. [8] Therefore, it is necessary to filter the information and present it to suit the preferences of the customer. [8] This process is known as e-commerce personalization. [8] With the increasing use of e-commerce on the Internet, personalization is becoming more important. [8] In the context of this paper, personalization is the ability of the system to automatically meet the various needs and interests of customers. Recommendation systems are having much commercial success in the business world and are becoming increasingly popular in a variety of practical applications. [9] For example, online stores such as iTunes, Amazon, and e-bay provide customized recommendations for additional products or services and are based on consumer behaviours. [9]

E-commerce is giving access to a worldwide audience and web developers have been devising new techniques and methods to enable e-commerce websites to purchase commercial advantages. [5] Search Engine Optimisation processes, and customize email sending, strategically placed adverts, and strong connections between chains of businesses. [5] The purpose of personalization is to promote and classify the tastes of each viewer. There are two main approaches to personalized recommendations such as a

content-based approach and a collaborative filtering approach. [10] In a content-based approach, it recommends items that the user would like in the past. In the collaborative filter approach, it identifies other users who have shown a similar preference for a given user and recommends what they like. [10]

Data mining has recently become an important area for personalization and it focuses on techniques for previously unknown, and useful information from a large amount of data. [10] As businesses used computers to store data, data mining technology began to evolve as a new approach to assisting navigation through the database. [11] Its purpose is to help businesses focus on important and useful information by extracting hidden forecast information from large databases. [10] [11] Data analysis is carried out by using the most appropriate statistical methods techniques which are helped to present qualitative data in a more meaningful way. [6]

Methodology

A. Data Collection

To explore whether local merchants are trying to understand the correlation between physical and online existence, we conducted an exploratory study of local businesses that have set up websites. And also, it is required to get permission from the owner since it is a problem regarding a real business. Hence, permission has been taken from the owner to develop the e-commerce personalization system to give solutions for the existing problems. Details about the current situation of the business were gathered by having meetings and discussions with the owner

and customer feedbacks was also considered. To gather the major requirements, open interviews were carried out with the owner and another employee of the business. And also, carried out the customer behaviours and pre-transaction details which can be recognized as sales of the business. Furthermore, customer requirements were also noted by having open-ended interviews with them. Apart from the open-ended interviews, simple questionnaires are planned to be prepared for the customers. The questionnaires were in a very simple way so that people can understand it very easily. By which that some more information regarding the business were collected.

B. Results

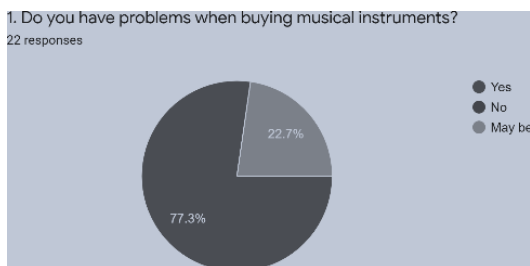


Figure 1. Problems when buying instruments



Figure 2. Products availability when buying instruments

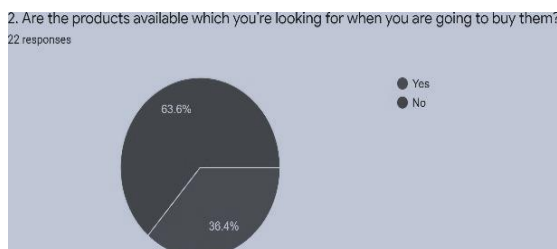


Figure 3. The satisfaction of the current system

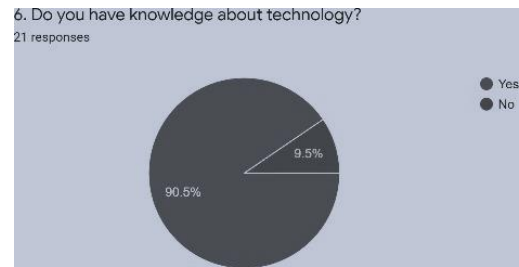


Figure 4. Willingness to use e-commerce applications

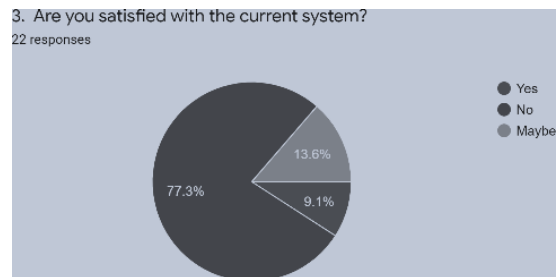


Figure 5. Willingness to compare instruments prices

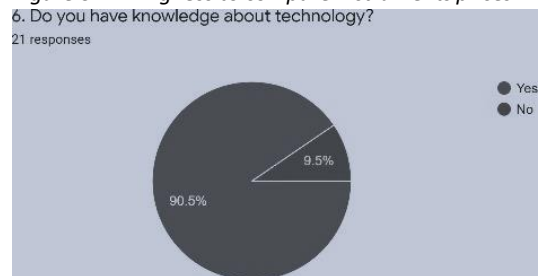


Figure 6. Knowledge of technology

Above mentioned survey results show that implementing such an e-commerce system is necessary for the improvement of the current situation of the system & shows that there are no technology barriers to implement. Through the statistics of this survey could get an overall idea about what customers think & which parts should be automated using this solution.

A. Analyzing the system

When designing the user interfaces of the system, it is expected to be designed in a very user-friendly manner. Since everyone is not with equal technical knowledge it has planned with simple interfaces. User's ideas have highly considered when deciding the colours for the interfaces. After requirements have been gathered and architectural design has been fixed, structuring the software began. At the

development stage should be concerning the security feedback is a major requirement. The implementation stage is the most important part which integrates the software with good services and components with the best workflow according to the organizational structure and end-user requirements. Especially the system is designed to avoid difficulties in supplying musical instruments to schools and institutes. As a solution regards the problems, they will be able to request orders and tenders through the system as well as print the documents via a pdf file. There are two types of customer accounts in the system such as personal and business which depend on the way they are requesting orders. Hence the customers can register with the system as a business account if they buy many instruments at once or need tenders. Another best opportunity is that the vendors can be registered to the system and request the orders to supply the raw materials and instruments for the business which has been found as a major problem in the local music industry. The system is integrated with social media to get involved in the young generation to enhance the local music industry in Sri Lanka. Hence the system has an active social media interrelationship where users ask and answer specific questions about the business and their products. On the business side, the administrator/owner of the business having the ability to maintain all customer details, vendor details, product details as well as category details. As a personalized system, it displays the most related instrument for the consumers by considering the previous preferences and send customize e-mails according to the previous search history because it is necessary to filter the information and present it to suit the preferences of the customer.

The personalized e-commerce web application will be prepared according to the

agile software development methodology which is one of the best software development methods. Agile methodology is a project management process primarily used for software development, where demands and solutions evolve through the collaborative efforts of self-organizations and cross-action groups and their clients.

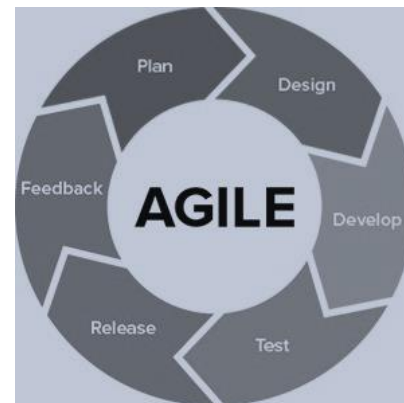


Figure 7. Agile Methodology

A. Data mining and personalization

After user categorization, the personalization module adapts meaningfully enriched content while running on the client-side. Various data extraction methods can be used to improve personalized systems such as clustering, association, classification, and similarity indexing. Clustering and similarity indexing methods can be used as a means to identify or group peer groups or content groups. Under the research has been identified the background of the population as school marchbands/orchestra, professionals, and music institutions in Sri Lanka. Association rules can be used to identify products that are often bought together for cross-selling. It can also be generalized to identify customer bias for target promotion. Classification is another medium for target promotion or categorization. Here we will consider a concept that is more related to the concept of association rule which is originally proposed in the context of supermarket data to study the relationship of customer buying patterns in transaction data. Four major instrument

categories have been identified such as Udarata, Pahatharata, Sabaragamuwa, and Traditional. Each instrument comes under those categories and it is the most effective way to generalize customer bias and identify products. The personalized e-commerce will be supported to the customers in achieving their primary objectives or goals. To assess the personalization of the personalized e-commerce web application, we use the Framework for e-Commerce personalization enhanced by Captain and Pervinen. [12] We use this model because it is the only framework in which privatization is evaluated in e-commerce. The model demonstrates that there are several requirements for the success of personalization and that they fall into two main categories: Consumer Behaviour and Technology Needs. If the three requirements are related to customer behaviours; 1) The personalized content presented to a user should have an impact on business returns. 2) The impact should be different for each customer - it should be heterogeneous. 3) The effect should be largely stable. Technology-related requirements, on the other hand, consist of technology implemented by an e-business to tailor content to specific users. These requirements are 1) the ability to measure the impact of personalization, 2) the ability to manipulate content, and 3) the ability to scale the algorithm used for personalization.

In this study, we only evaluate the requirements regarding customer behaviours by considering their purchase history. The suggestion principle asserts that users are expected to achieve their target behaviours if the system offers suggestions while in use.

When considering the customer behaviours, it seems to be that January, July, and December are the most profitable periods for the business and the system will be able to recommend particular items for the regular

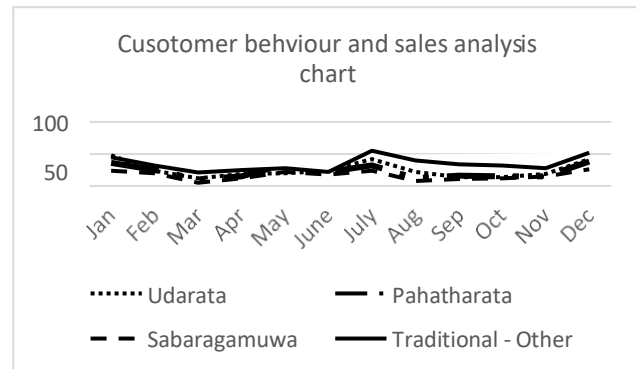


Figure 8 Customer behaviour and sales chart

customers as they prefer. For that here we will use the techniques of customizing e-mail sending as well as customize a search bar that offers suggestions while typing the product name in the search bar. It allows customers to search for product information, compare prices and benefits, and assess its value before making a purchase.

Conclusion and future works

E-commerce web applications are a very important technology for information, services, buying goods, and selling goods online. Electronic commerce and the Internet integrate both the service and goods sectors across local and international boundaries. To explore whether local traders are trying to understand the correlation between physical and online existence, we did an exploratory study of local music instruments businesses and small businesses. Customized market and product categories provide extensive scrutiny of business processes to maximize business output. So, this system is the major component that is introduced to maximize the profit of the Sri Sarasavi Musical Instruments Shop Piliyandala, Sri Lanka. The benefit of this system is not only to its owner and employees but also for the customers and other businesses too. The main purpose of developing the personalization e-commerce system is that customers can check the availability of the instruments without visiting the shop and they can save their time. Timesaving is one of the important benefits that people can have through e-

commerce technology than traditional commerce concepts. Due to space constraints, the business needs only the minimum amount of goods in storage. A virtual store allows businesses to store many items regardless of the cost of inventory. Long term storage of instruments is not needed as they have displayed all the details of the available instruments in the system because there are no physical marketplaces for the e-commerce transactions and a customer can request the needed instruments through the system. The business owners are well satisfied with the system and giving a maximum contribution to developing the application. The major task is they need to have an effective training period and proper guidelines to gain the maximum benefits of the system. Anyhow some possible barriers prevent introducing an e-commerce application because some instrumentalists never buy non-electronic instruments online due to the inability of testing the acoustic and build quality. In this study, we only evaluate the requirements regarding customer behaviours as these can be inferred from the system. In the future, we intend to further assess technology as a necessity.

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