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Comprehensive Survey of Different Techniques and Methods Used for Eshop Software Application

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Abstract: ***Latest improvements in the online shopping system through the machine learning, data mining to improve the handcraft products marketing. One of the main reason to build the solutions for the handcrafts is to develop the products with the use of latest technologies for achieving the success in the handcraft industry. Handcraft are the products which are made by the craft person and it is very unique in market. In the handcraft store we can eliminate the middle man. This paper reviews the various methods and techniques which are used for handcrafts. Firstly, we provide a review on the different strategies used in handcrafts with respect to present world. Then we highlight the different techniques applied to create platform for handcrafts-frameworks, data mining, machine learning and commerce and internet technology. We also give an overview of the results achieved by using this different techniques.***
Keywords: Spring Framework, MVC, Machine Learning, Data Analytics, Naive Bayes

I. INTRODUCTION

After the COVID-19 pandemic, many businesses chose an online option rather than going offline. People are not interested in going to the market to purchase the product. Rather, customer simply choose an online platform to buy the products customers want. The primary goal of a handicraft store is to reach as many customers as possible in order to increase sales and profit for the company. It mainly focuses on artisans in rural areas. But the artisans in rural areas are dependent on middlemen to sell their products. It aims to increase the sale of handloom products, which directly increases the profit of artisans. Various marketing strategies are used to grab more audience attention. Social media platforms such as Instagram, Facebook and LinkedIn are used for marketing purposes. Different machine learning techniques, such as recommendation systems and chatbots are used[13]. A machine learning algorithm such as Naive Bayes is used for building a recommendation system that uses machine learning techniques to predict whether a user will like a given product or not. With the help of a chatbot, users can interact with the system to solve their problems. It is a web-based portal created with dedication in mind and the hard work of individual artisans and craftsmen[11]. Its aims are to use and combine modern technology to provide artisans with a platform to show their skills in crafts to a wider range of audiences. This approach reduces the cost of involving a middleman and also provides an opportunity for a greater profit margin for the sellers who sell the crafts. Sellers can directly register on the portal and show their skills to the world. Handicraft is the industry where users can buy various products handcrafted by skilled artisans and individual manufacturers. The admin has all rights to the data displayed on the portal. Artists register as sellers and send their product info to the admin, who manages the data at the backend. Customers can easily buy the product with a user-friendly interface.

II. RELATED WORKS

A. Different Strategies used in handcrafts with respect to present world

Following are the different main strategies used in handcrafts:

1) *Marketing:* Many people in India have a unique skill and knowledge for producing handcrafted goods. The Indian handicraft industry is a highly decentralised industry, so to overcome this, we need to go with a good marketing strategy[13]. Author have mentioned the difficulties that artists have in selling their products in this paper. In the traditional way, the artist depends on the middle person for many things like finance, raw materials and marketing for finished products. India is a country in which the artists are far away from digital marketing due to illiteracy and poverty. The success of handicrafts is determined not only by the crafts themselves, but also by the marketing strategy employed. This paper also discusses the importance and advantages of internet marketing. Product marketing can be used effectively to sell the product and create a large audience for the handicraft industry.

2) *Income and Employment:* This paper discusses how the handcraft industry can help people find work. In India, many sectors contribute to the economy[14]. The handicraft industry also provides jobs for the unemployed peoples. Employment leads to the development of the country. In the handicraft industry, the handloom sector is a prominent source of employment, which is also part of the agriculture sector. Different parts of India have different specialties; rural India is truly based on agriculture products like wood, bamboo, clay, cane, etc. This paper focuses on the socioeconomic status of women involved in traditional Jari Kari, as well as the need for organizations, groups, or the formation of cooperative societies to assist remote artisans in reaching buyers[2].
3) *Export:* In this paper, author have mentioned how the handicraft industry makes exports around the globe[15]. The handicraft industry has a great opportunity to sell products across the state, country and globe. It can be sold in both domestic and international markets. Handicraft products mainly include things like shawls, Zari works, handprints, and handmade jewellery. In this paper, author have discussed the exports of handicrafts, which have shown an increase of 16.81 percent over the similar period in 2013–2014[15].
4) *Weakness and Challenges:* The handicraft industry has many weaknesses and challenges, which are discussed in this paper to improve the process and gain control of the handmade product market[16]. In this paper, the artisans work is described on a small scale in rural districts. Some of the weaknesses authors have described are the lack of modern managerial skills, problems due to less education, less information about the market, a lack of knowledge about the latest designs and the demand of the market, no information about exports, etc. Along with the challenges and weaknesses, it describes the opportunities created in the handicraft industry, such as providing employment[15], increasing market demand to export, providing financial assistance, and expanding marketing opportunities.

B. Different Techniques Applied to Create Platform for Handcrafts

Following are different techniques applied for creating handcrafts platform:

1) Frameworks

a) Spring MVC Framework

Model View Controller or MVC, is popularly called a software design pattern to develop web applications. The MVC consists of three parts:

- *Model:* The model is the first level of MVC and is used to store data.
- *View:* View is used to display all data to the user.
- *Controller:* The controller part consists of software code that is used to control interaction between the model and view parts.

MVC is used to separate the implementation logic from the actual implementation part. All the requests received by controller for application which is used to prepare data needed by view part. The view part then uses this data to generate the result [4],[8].

b) Advantages of MVC Architecture

- MVC helps to reduce the complexity of application by dividing it into three parts i.e., model, view and regulator.
- MVC is best for developers who want full control over their application, as MVC does not use server-based forms.
- MVC supports the faster development of applications.
- With MVC modifications in one part, it does not affect the other part.
- MVC provides multiple views of the model.

This paper focus on designing of web applications using Spring MVC framework [3]. Spring MVC framework uses the Model-View-Controller pattern for designing web applications faster and easier. It concludes that MVC pattern architecture and technologies like JSP, Servlet and EJB on the platform of J2EE have simplified the development process of web applications.MVC architecture provides the concept of parallel development as it divides the application into three layers, so different developers can work simultaneously on layers to build applications, which reduces time and speed up the development of applications.

c) Spring Framework

The Spring framework is an open-source application framework. It is easy to build java application using spring framework. Spring makes java programming easier, faster and safer. Spring is world's most popular Java framework which is used to build web application faster. The architecture of spring consists of seven modules -

- The core container
- Spring context

- Spring AOP
- Spring DAO
- Spring ORM
- Spring Web Module
- Spring MVC framework

d) Features of Spring Framework

- IoC (Inversion of Control) Container is one of the core features of spring which is used to manage and configure java object. It is used to manage the life cycle of java object.
- Spring framework provide support for aspect-oriented programming.
- Spring offers an abstraction mechanism that enables users to work with nested transactions, save points, simplify transaction management across the application.
- It focusses on use of spring framework for building web application. A lightweight multi-level E-commerce system based on Struts2, Spring and Hibernate has been designed in this paper, and the three frameworks' integration methods and strategies have been discussed as well.

2) Data Mining

Data mining is the process of extracting and finding out the patterns in large datasets[10]. Data mining is an interdisciplinary subfield of computer science with an overall goal of finding out important information from a dataset and transforming the information into a comprehensible structure for further use. The term "data mining" is misnamed because the goal of data mining is extracting patterns and information from large dataset not extracting data. It is frequently used with large-scale data for information processing for collection, extracting information and analysis of data. The process of data mining is the semi-automatic or automatic analysis of large volume of data and finding out interesting patterns from it.These patterns is kind of summary for input data, and it is used for further analysis, for example this pattern is used for predictive analytics and in different machine learning task to obtain more accurate result. Tasks involve in data mining:

a) Anomaly detection
b) Association rule learning
c) Clustering
d) Classification
e) Regression
f) Summarization

3) Machine Learning

a) *Chatbot AIML:* When a user wants to purchase something from artisans, he or she requires instructions on how to use the system and other items, much as when shopping in a store. To offer these kinds of services online, we use chatbot that provide service to user. When a user first visits an online store, he or she can ask questions to learn more about the software. A pattern matching algorithm is used by the system to send a customer's query to the AIML Knowledge Base System (KBS) for an answer. The response is then sent back to the user and then to the system. There are numerous chatbot implementations in various fields [6].In this paper, author have also included multi-language support, which makes this application more interactive with the user. To support multi-lingual capacities, this paper proposes to develop Bangla conversational agent that can chat user with Bangla. AIML supported the Avro keyboard layout, Unicode and ANSI[6]. When chatbots get input data from users, we have to add a translator program. The translator checks the input. If the input contains the English alphabet, the translator will pass it directly to the system; otherwise, it will turn the input into an English phrase and pass it on to the knowledge base system for further processing. However, a translator is not necessary for the response.

b) *Naive Bayesian Algorithm:* The Naive Bayes classifier is used to measure the probability that customers will buy a product or not[11]. Data were collected from various past resources and then analysed using naive Bayes classifiers. An identification classifier would analyse the product review to determine the aggregate opinions about each of them.

c) *Sentiment Analysis:* Sentiment analysis is the most commonly used technique for analysing text-based data and identifying sentiment content. Suggestions, feedback, tweets, and comments all create a large amount of text data. Sentiment analysis involves the use of artificial intelligence (AI) to collect text data from a variety of sources, identify opinions, and classify the

findings into a positive, neutral, or negative response to a product or service. This paper used CNN and GRU networks to extract the main sentimental and contextual features of the reviews, and an attention mechanism is used to weight them [12]. By using a model to analyse user reviews, we can help merchants on e-commerce platforms obtain user feedback in time to improve service quality.

4) Commerce and Internet Technology

In this paper, author analyse the deep learning-based C2B cross-border EC business models[1]. First, a few of the business model components are chosen for research work after being analysed. According to the experimental findings, the important variables rise as user value rises, but the overall pattern stays the same. The number of active users grows as user value rises, making the rise in active users more noticeable.

C. Results Published in Previous Studies

Ref	Datasets Used	Algorithms/Approach	Performance/Accuracy
[6]	Dataset containing AIML files.	1.knowledge base system pattern 2.matching algorithm	1.time complexity is order of n, where n is the number of words and space complexity is depending on its memory location whose memory it use and memory capacity. 2. develop bangla supported shopping assistant to show multi-lingual properties of chatting system.
[10]	The Dataset is obtained from online shopping agency which sells data online ..The dataset is composed of online ordering log file for three months. The dataset consists of 304 instances and 26 attributes.	Bayes Net, Naive Bayes, K Star, Classification via Clustering, Filtered Classifiers, Decision Table,J48,Simple Cart.	Bayes Net -71.62% Naive Bayes- 54.13% K Star- 50.83% Classification via Clustering - 36.30%
[11]	Alibaba E-commerce User Behavior Dataset	1. Support Vector Machine (SVM) Naïve Bayes Classifier (NBC)	The accuracy of SVM = 86.7% The accuracy of NBC = 77.4%
[12]	Dataset used - book reviews collected from Dangdang using web crawler technology.	Cross Validation 1. 10-fold cross validation 5*2 cross validation	1.The accuracy of 10-fold cross validation = 93.2% 2.The accuracy of 5*2 cross validation = 93.3%

Fig. 1 Results *published in papers*

III.PROPOSED METHODOLOGY

This paper concludes how the different techniques can be useful for the e-shop application. The naive Bayes algorithm is useful in e-shop application, further naive Bayes algorithm is proposed in this paper for the better sentimental analysis in review classification, to classify the reviews according to customer review positive, negative and neutral. The naive bayes algorithm can also be helpful in the recommendation engine to recommend the product. As naive bayes algorithm is simple to implement and it gives the more accuracy.

IV. ARCHITECTURE DIAGRAM

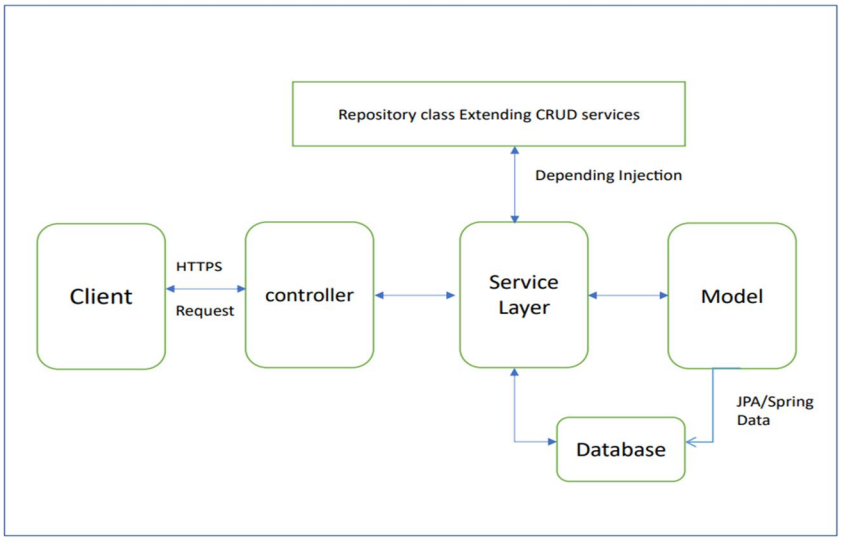

Fig. 3 Spring boot architecture diagram

This paper proposes Spring Boot, a layered architecture in which each layer communicate with each other[4].

1) *Presentation Layer:* The presentation layer processes the HTTP requests, translates the JSON parameters into objects, authenticates the request and forwards it to the business layer.
2) *Business Layer:* The business layer is used to handles all the business logic. Business layer is used for authorization and validation.
3) *Persistence Layer:* The persistence layer contains all the storage logic and transfers business objects to and from database rows.
4) *Database Layer:* CRUD (create, retrieve, update, delete) operations are performed in the database layer.

V. CONCLUSION

This paper concludes that how e-commerce now become an important factor for many organizations in daily running of their business. Then different factors that contribute to the success of the E-commerce industry are mentioned like consistency in website design, planning, marketing strategies and product quality should be same as display on portal. This paper focus on how to use different techniques, framework and machine learning algorithms to build e-shop application and also how e-shop is important for customers.

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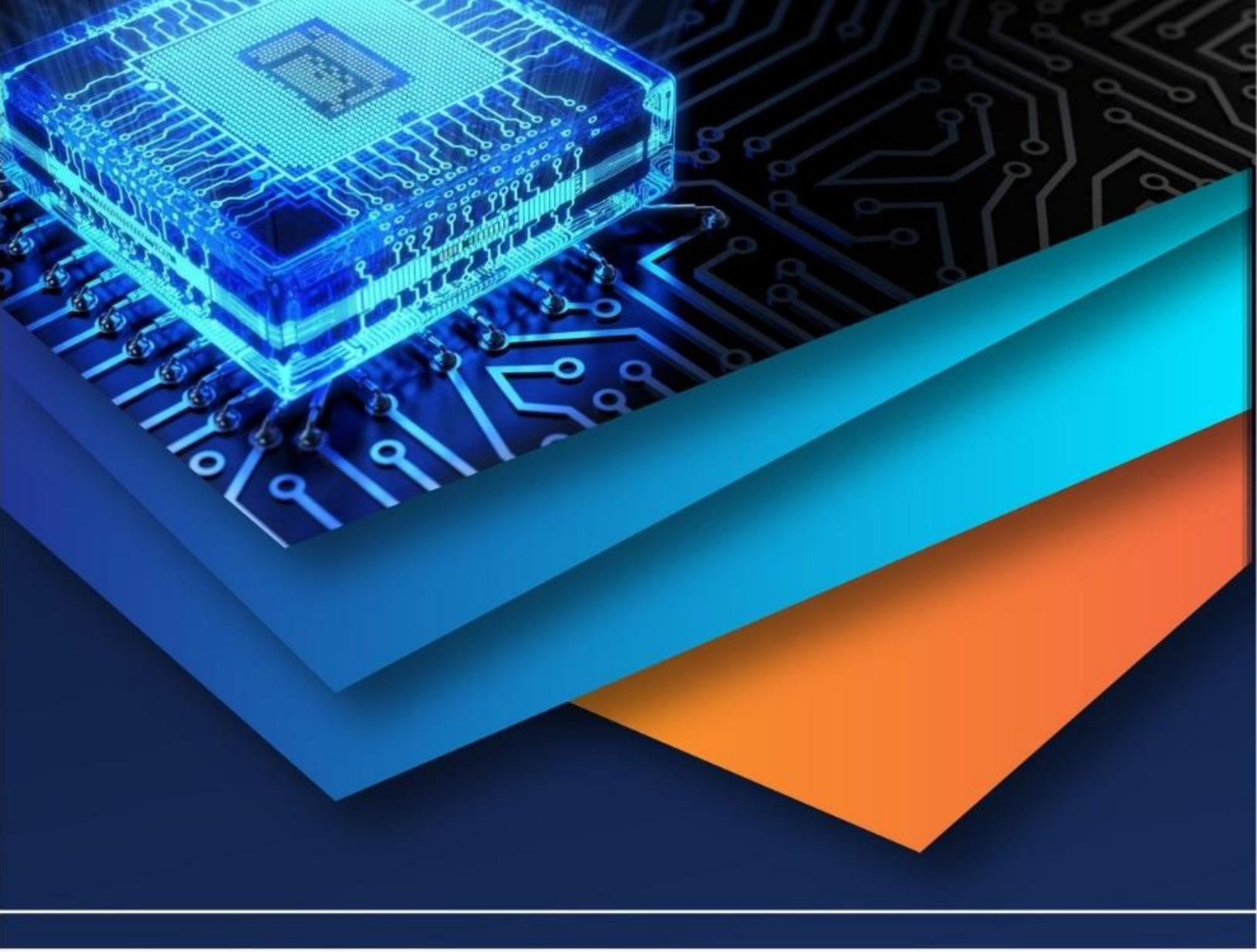

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