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WEB-KART

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ABSTRACT

Web-Kart is basically an online shopping platform where a user or customer can easily purchase the products as per their requirements. It is a type of electronic commerce that enables customers to make direct purchases from sellers utilising a web browser and the Internet. Customers can find a product of interest by going to the retailer's website directly or by utilising a shopping search engine to look up alternative vendors. Search engines for shopping display the availability and cost of the same items at several online merchants.
The objective behind this project is to provide convenience to user by providingthem links different e- commerce site at a single platform for a particular product such as groceries, electronic devices, books, electrical devices, etc. through ML algorithms. This platform will have different ML library such as OpenCV and different algorithms. It will also contain image recognition.

This project will be implemented using ML algorithms, and the library which will be used in the project is OpenCV. A library of programming functions with a focus on real-time computer vision is called OpenCV (Open Source Computer Vision Library). It was initially created by Intel, then backed by Willow Garage and Itseez (which Intel eventually purchased). The Apache 2 Licence for Open-Source Software makes the library cross-platform and freely usable. OpenCV now offers GPU acceleration for real-time activities as of 2011.

Keywords: E-commerce, Product, ML library, Image Recognition, OpenCV, Real-time

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INTRODUCTION

More independence is required, which improves activities and makes routine ones easier and quicker. Shopping is a crucial task in which people use a lot of energy. [6] Today, most shopping Centre makes use of those traditional shopping baskets and shopping trucks for their customer. The customer must then add each item they need to purchase to their cart and wait in queue to pay their bills at the register. This form of checkout is hard and time-consuming, which causes a significant amount of traffic at the counters. [13] To resolve these problems and strengthen the current structure, we have composed a Smart Shopping Cart. [1]

Web-Cart is a website that help people to buy products online such as books, electronic devices, groceries, and many more. This website is a directing website where a user can search a product in a convenient way. [4]
User can visit the website and upload the photograph of the product or click using a webcam, then this website will show list of products. User can select any of the recommended product where it will take user to product page which include product image, product description, product MRP and many several things. [7]

This Project will be made by some of the Trending and Latest web frameworks and it will be fully responsive with an attractive UI Since we have a large community around us so this project will serve them better in the terms of information and knowledge. [8]

The idea of a smart trolley has begun to be used in the current system, however most retail establishments do not yet have a full smart shopping system. These days, shopping and making a purchase from a supermarket or mall has become a regular ritual. [9] In most of these malls and supermarkets, after the customer purchases the items, they will move to the billing counter for paying the bill, where the cashier uses a barcode system to create the bill and scan the item. Long lines form at the billing counters as a result of this lengthy and time-consuming process. The proposed smart shopping system uses machine learning and machine vision on the cart itself of the conventional counter billing system to solve the aforementioned issue.

OBJECTIVES

- The Main and Only Objective behind this is to provide convenience to user by providingthem links different e-commerce site at a single platform for a particular product such asgroceries, electronic devices, books, electrical devices, etc. through ML algorithms.
- This platform will have different ML library such as OpenCV and different algorithms. Itwill also contain image recognition.

1. LITERATURE REVIEW

A barcode scanning system was developed in 2016 to help customers calculate the total cost they are about to pay, which they could then use WiFi to send to the store's server. In addition to this, the model has additional amenities such an LCD screen that shows product details, the price, and discounts. The proposed model, however, made no indication of the scanning system's implementation plans or how they would prevent customers from crowding the scanning area. This strategy just clears the cashier area while luring customers into the scanning area.

In [15], M. Jayshree et al. They explained that the integrated items weight measure will be checked by the load cell module that is maintained at the base of the cart and the weight measure will constantly ship to the database. The barcode will be read in a fraction of a second. The product number is sent to the server in addition to the load. We can therefore infer from this study how a weight sensor would integrate with the system, providing an understanding of the product's addition or removal and generating a bill in line with that.

In [10], H. Zhang et al. have created a deep learning-based system for acquiring and identifying the barcodes on medical labels, and its viability has also been confirmed. This system has a high real-time performance and decode rate that satisfies the demands of the applicable engineering applications. The approach employed in this study can address positional issues including distortion, fouling, and blockage (blocking the view), which are challenging to address using conventional techniques. Therefore, the combination of classical image processing and neural network localization has significantly enhanced software's ability to deal with linear distortion Data Matrix code.

In [14], Ms Visalatchi et. al. they explore the model for visual object recognition. This model was extensively tested to operate in various kind of situation such as non- plain, real time, complex, and changing environment. The system is also capable of recognizing objects that are in varying sizes and the recognized object are converted into an audio format along with their location. Along with tagging the items, it displays their precise placement inside the image and their tags. In order to deliver intelligent vision (object recognition), the suggested system will employ TensorFlow and neural network methods. It aims to do object recognition and pattern analysis with the least amount of localization mistake possible, employs dynamic threshold, improves productivity, and boosts performance.

In [5], Adithya. R et. al. In retail centres, they put in place a smart, effective, productive, safe, and affordable Li-Fi system. To reduce the difficulty in the current shopping system, the system is capable of using Li-Fi, RFID, and VLC. Their system is strong and capable of fixing the present system's problems with shopping. The most recent development in communication technology, known as Li-Fi, when integrated with the current shopping system offers the finest possible shopping experience. They think that the suggested model shopping system will rank among the most promising new technologies.

In [11], Ragesh et. al. construct an automatic billing cart using deep learning. Only the three objects—potatoes, tomatoes, and carrots—can be detected by the system they have created. The object detection is 70% accurate. They suggested a brand-new, hassle-free purchasing experience in that initiative. The technology is primarily intended for ingestible items like fruits and vegetables. The RFID tags now in use cannot be adhered to foods like fruits and vegetables. Barcodes and barcode scanners are also the most popular shopping methods in India. Practically speaking, barcodes cannot be applied to all fruits and vegetables that a client desires; nevertheless, employing object detection for this purpose provides the customer the choice to purchase and pay for whatever fruits or vegetables they like.

In [12], Sakorn Mekruksavanich et. al. develop an IoT-based smart shopping basket. Customers will be provided with a very advantageous approach to avoid the inconveniences they typically experience while shopping, especially during the holidays, with the help of this kind of smart shopping system. Customers will be able to handle all of their purchasing requirements in the retail environment by using the system outlined in this research by merely using the application on their smart phone or device. There is no need to wait in a long queue at the register because the items are quickly scanned after being added to the shopping basket or cart, and the bill is prepared digitally and sent to the customer's registered email address. Therefore, the strong potential of an IoT system that is able to be implemented in supermarkets and shopping malls can be seen.

In [3] O. Boyinbode and O. Why is Firebase the best mobile backend as a service, as Akinyede has explained? According to tristatetechnology.com, the use of barcode readers in Nigerian supermarkets results in inefficient time management. They noticed that shoppers must wait in queue for 20 to 30 minutes. Due to the sensitivity of the laser and its low reading failure rate, they suggested in their model replacing barcode readers with RFID readers. The study's obvious flaws include the expense of execution and inadvertent sensing of objects due to reader closeness.

Researchers from the University Technical Malaysia Melaka [2] hope to assist store owners in reducing the cost of purchasing barcode devices by substituting webcams for them. The barcodes on the pictures the camera takes are processed using MATLAB. A graphical user interface is used to show the retrieved data and query the database. According to the study, the difficulty in designing the algorithm was brought on by the many kinds of barcode systems.

METHODOLOGY:

Following are the technologies that can be used for the development of the project:-

1. OpenCV:- A computer vision and machine learning software library called OpenCV is available for free use. To hasten the inclusion of artificial intelligence into goods, OpenCV was used to develop a common infrastructure for computer vision applications. Since 1999, Willow Garage and ItSeez have been responsible for maintaining OpenCV, which was first created by Intel. A collection of programming functions for real-time computer vision called OpenCV (Open Source Computer Vision) is available for free for both academic and commercial use because it operates under a BSD licence.

2. Scikit-Image:- A Python programming library for image processing is available for free under the name Scikit-image. It contains algorithms for feature identification, analysis, filtering, morphology, segmentation, geometric transformations, colour space manipulation, and more. It is made to work with Python's NumPy and SciPy scientific and mathematical libraries.

3. Numpy:- Large, multi-dimensional arrays and matrices are supported by NumPy, a library for the Python programming language, along with a substantial number of high-level mathematical operations that may be performed on these arrays. With help from a number of other programmers, Jim Hugunin created Numeric, the forerunner to NumPy. NumPy was created in 2005 by Travis Oliphant, who significantly modified Numeric to integrate features from the competing Numarray. Numerous people have contributed to the open-source programme NumPy.

Phases of Iterative Model

The fundamental distinction between the iterative waterfall model and the traditional waterfall model is that the latter does not provide feedback channels from any step to its preceding phases.
The image below depicts the feedback pathways that the iterative waterfall paradigm introduced.
These feedback routes enable for the correction of programming faults when they are discovered at a later stage. The feedback channels enable the phase in which errors are made to be reworked, and these modifications are reflected in the later phases. However, there is no feedback route to the feasibility study stage because it is impossible to back out of an endeavour once an idea has been accepted.
It is best to catch errors while they are being made because this is the ideal moment to do so. To correct the errors, less time and effort is required.

Phases of iterative waterfall model

1. **Feasibility study:** The feasibility study involves understanding the problem and then deter- mine the various possible strategies to solve the problem. Based on their advantages and disadvantages, these various alternatives are examined. The best solution is selected, and the other steps are completed in accordance with this solution plan.

2. **Requirement gathering and analysis:** In this phase, requirements are gathered from users and check by an analyst whether requirements will fulfil or not. The requirement collecting and analysis phase of the SDLC is the most crucial stage because it is at this point that the project team starts to comprehend what the client wants from the project. The project team starts by analysing each requirement as soon as it receives all of the customer specifications or requirements. In this phase, SRS document is prepared.

3. Design: The transformation of the customer requirements as outlined in the SRS documents into a format that can be implemented using a programming language is the focus of the design phase of software development. The three layers of design phases that make up the software design process are as follows: Interface Planning. Architectural Design. The software is designed by the design team using a variety of diagrams, including state transition diagrams, class diagrams, data flow diagrams, and activity diagrams.

4. Coding and Testing: The goal of the coding phase is to convert a system's design into high-level code, which is subsequently subjected to unit testing. Individual software modules or components are tested as part of a type of software testing known as unit testing. A programme is tested by giving it a set of test inputs (or test cases), then watching to see if it acts as predicted. Software testing begins utilising various test methodologies after the coding phase is complete. There are other test strategies, but the white box, black box, and grey box test strategies are the most popular.

5. Integration and System testing: In system testing, the entire application is examined for compliance with both functional and non-functional requirements. In contrast, integration testing involves examining the interfaces between modules that are connected to one another. In system testing, we check the system as a whole.

6. Maintenance: After a software product has been delivered to the customer, it can still be modified through a process called software maintenance. The major goal of software maintenance is to update and alter software programmes after they are delivered in order to fix bugs and boost performance.

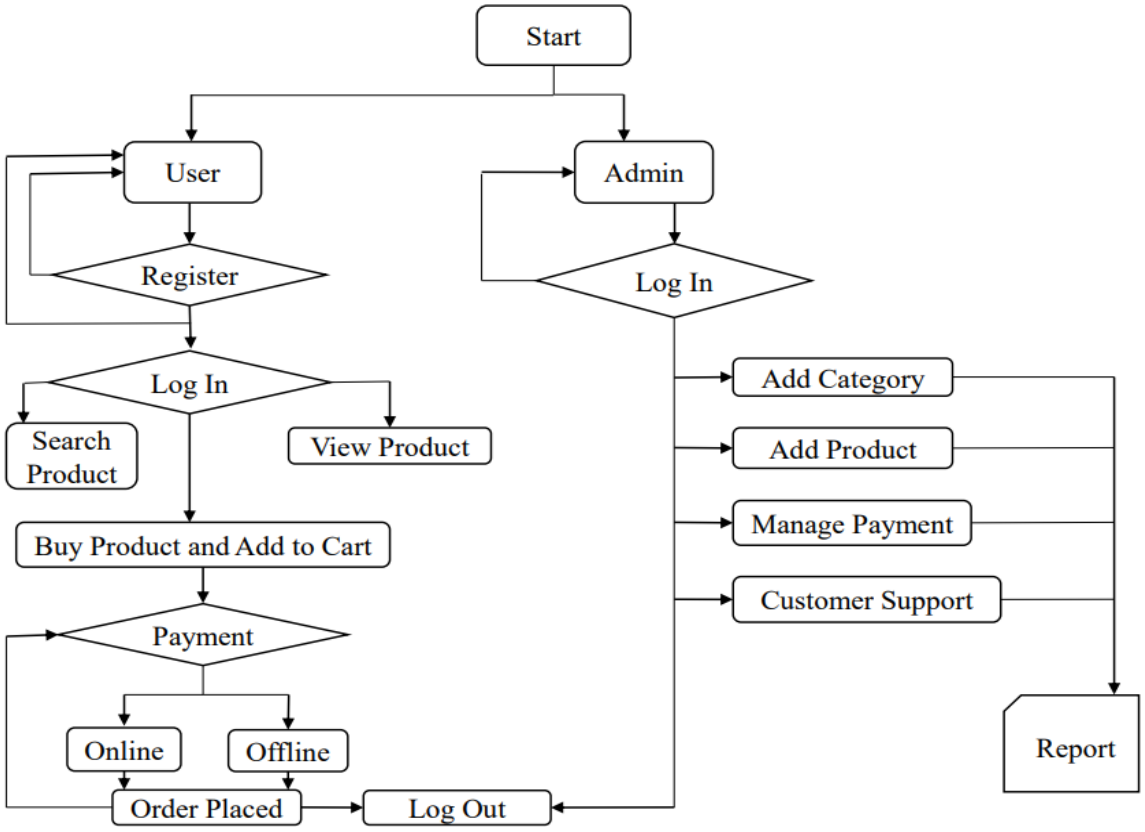
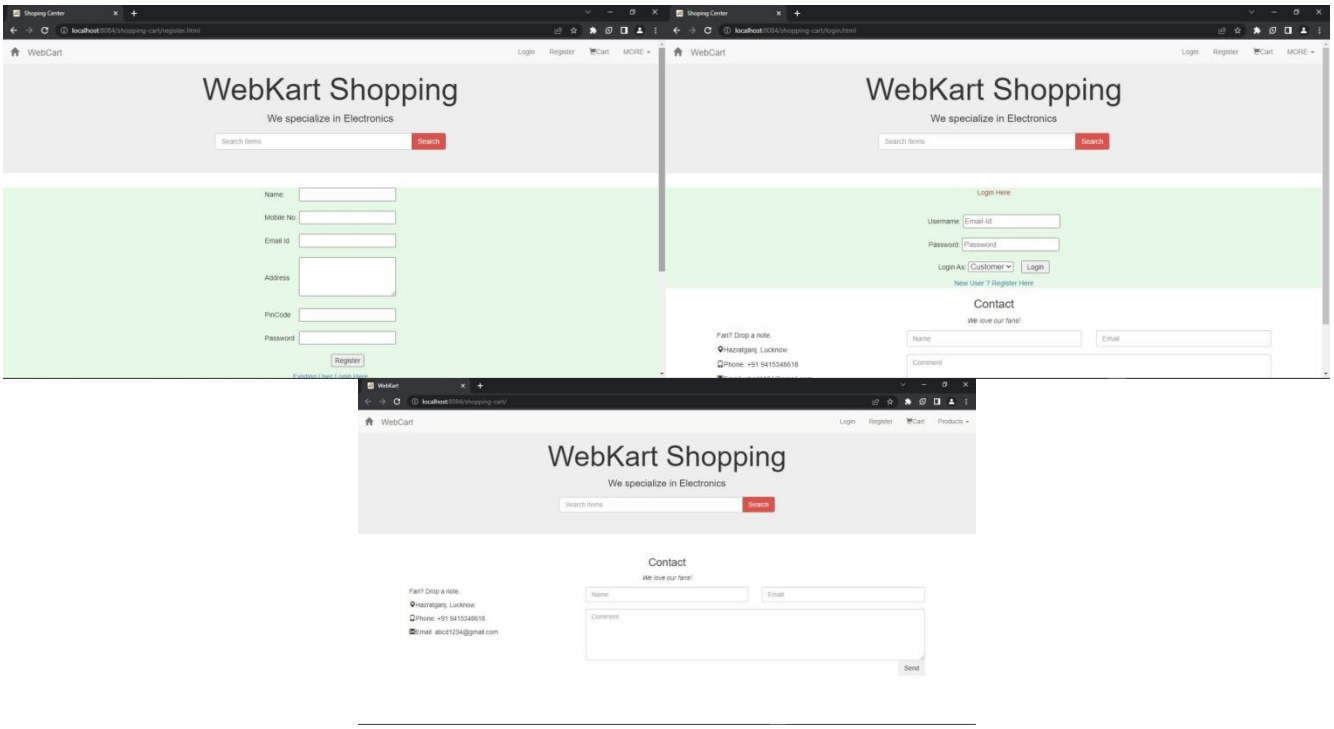


Fig.1. Activity Diagram

OUTPUT RESULTS



Software Maintenance must be performed in order to:

- Correct faults.
- Improve the design.
- Implement enhancements.
- Interface with other systems.
- Migrate legacy software.

APPLICATIONS

- The first stage in selling, whether online or offline, is to catch the customer's attention. You may do the same thing easily and without worrying about money restrictions by setting up an internet store. Making a virtual store on your website makes it simple for customers to find you, learn about your products, and make an immediate purchase from you. The social media and marketing features of Builderfly help you even more to increase your online visibility.

- No longer can your business be impacted by holidays, occasions, day-night cycles, or regional borders. With ecommerce solutions like Builderfly, you can quickly launch your online store and begin selling 24/7 right away. Keep your store open all year long and provide your clients with high-quality merchandise.

- Offer all the convenient payment methods to your customers by offering in-store pickup, online orders, and offline payments. The end objective is to have more satisfied clients who will buy from you again. You can provide your customers with a perfect shopping experience across all devices, regardless of configurations and operating systems, by using our well designed responsive themes.

- You may create legitimacy for your brand by using a website. You gain the trust of your customers when you communicate your vision and policies clearly to customers. With our user-friendly design editor, you can keep your brand's online reputation strong and take your branding to the next level by including your brand's unique personality into the design.

- You may optimise your business processes by creating an online store with ecommerce systems like Builderfly. You may coordinate all of your company's operations to achieve your end objective by managing your inventory, orders, customers, sales channels, and marketing techniques. We maintain your inventory and catalogue in sync across all of your sales channels so that you can concentrate on expanding your business.

- Customers can obtain accurate product information from your online business. You may quickly address client concerns via online chat, email, or phone to improve relationships with them. With Builderfly, you can maintain your brand's omnichannel presence and be accessible to customers wherever they are.

- Through your e-commerce website, you have the opportunity to share the history of your business with your customers. You may establish a stronger connection with your audience and quickly become a brand by utilising the power of storytelling. You may update your online reputation, enhance your offerings, strategically promote, and turn your ideas into a brand using Builderfly.

ADVANTAGES

- Customers can quickly and easily find the products they are looking for by simply uploading an image or taking a picture of it.

- It can help increase customer engagement by providing an interactive and personalized shopping experience.

- Both new and existing clients may be drawn in as a result.

- This can help improve the accuracy of search results and reduce the number of irrelevant products that customers have to sift through.

- Marketers or e-retailers offer discounts to the customers in order to attract them to shop online. Because upkeep and real estate costs are eliminated when selling things online, retailers can offer products at tempting prices.

LIMITATION

- It can be effective in many cases; it may not always accurately identify the products that customers are searching for.

- Image-based searching may not be available for all products on the shopping website, particularly for those that are less popular or have not been properly cataloged.

- Online shoppers may not be aware of backorders for weeks after placing their orders. Additionally, when buying gifts, this is very problematic.

CONCLUSION

- Image-based searching is a relatively new and innovative feature that can provide a competitive advantage for shopping websites. It can improve the user experience, increase conversion rates, and expand the customer base.

- While image-based searching has several advantages, it also has limitations, such as limited accuracy, limited product availability, and privacy concerns.

- Image-based searching can be applied to a variety of product categories, including fashion and apparel, home decor, beauty and personal care, electronics, food and beverage, and automotive.

- Shopping websites must carefully consider the implementation of image-based searching, including the resources required and the potential impact on customer adoption and privacy.

- As technology continues to improve and machine learning algorithms become more sophisticated, image-based searching is likely to become an increasingly important feature for shopping websites.

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