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Empowering Rural Craftsmanship through AI Enabled Market Linkage

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ABSTRACT: Many rural artisans face challenges in reaching a wider market and connecting with potential buyers. The lack of a streamlined platform for market linkages often hinders their growth and sustainability. This project aims to address the challenges faced by skilled potters in marketing and distributing their unique creations. Recognizing the limitations in market access and modern marketing strategies, the project focuses on developing an e-commerce platform. By leveraging this web application, artisans can bridge the gap between their craftsmanship and potential buyers, thereby fostering economic sustainability and preserving cultural heritage. This platform will provide rural artisans with a user-friendly interface to showcase and sell their handcrafted products and also find the nearby registered customers using OPTICS algorithm using AI.

KEYWORDS: Market linkage, Rural artisans, E-commerce platform, Skilled potters, Craftsmanship, Web application, Economic sustainability

I. INTRODUCTION

Handcrafted products, crafted with skill and passion by rural artisans, embody a rich tapestry of cultural heritage and artistic expression. From intricately woven textiles to meticulously carved wooden artifacts, these creations serve as tangible manifestations of centuries-old traditions and craftsmanship. Rooted in local communities and traditions, handcrafted products play a vital role in preserving cultural identity and fostering economic sustainability in rural areas.

Defined by their unique blend of traditional techniques and contemporary aesthetics, handcrafted products encompass a diverse array of forms and functions. Whether pottery, weaving, carving, or any other artisanal craft, each creation bears the imprint of its maker, reflecting their ingenuity, creativity, and cultural heritage. Despite their intrinsic value, rural artisans face numerous challenges in marketing and distributing their products, often limiting their access to wider markets and opportunities for growth.

This project aims to address the challenges faced by rural artisans in marketing and distributing their handcrafted products by developing an innovative e-commerce platform tailored to their needs. By leveraging digital technology and marketing strategies, this platform will provide artisans with a user-friendly interface to showcase and sell their creations to a global audience. Additionally, the platform will employ advanced algorithms, such as the OPTICS algorithm powered by AI, to connect artisans with nearby customers, further enhancing their market reach and visibility.

This paper explores the challenges facing rural artisans in marketing and distributing their handcrafted products and proposes innovative solutions to overcome these obstacles. Through collaboration, innovation, and knowledge sharing, we can create a more inclusive and sustainable future for rural artisans, ensuring that their invaluable contributions to culture and heritage endure for generations to come.

II. LITERATURE REVIEW

Arunava Dalal1, Dr. Subrata Chattopadhyay's proposed system study has tried to list the major issues plaguing the Indian handicraft sector and the artisans. Qualitative content analysis has been adopted to capture the empirical observations and to decipher the different variables impacting the artisans and the sector. The data for the analysis was collected through in-depth interviews of forty-five artisans from different parts of Bengal. Based on the findings, the

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paper has conceptualized a model, with internet technology being the enabler, addressing the identified constraints to improve the socio-economic condition of the artisans so that they move towards having a sustainable livelihood.

Li Qin Hu and 4 others proposed a detailed study of cross border e-commerce of lemon company has been done, it analyzes and summarizes its business products, main consumer objectives, existing logistical distribution model and combines the status of logistical operations of Lemon Company to analyze the logistical aspects of Lemon Company. Existing problems and factors that affect the choice of the logistical company's distribution model are analyzed in detail. An index system for the selection of cross border e-commerce logistical distribution models has also been constructed.

Amisha Shah, Rajiv J. Patel proposed attempt to highlight the role of E-commerce in the development of rural artisans in India by illustrating some efforts of Government and Non-Government agencies, Groups and Individuals in uplifting the socio-economic standard of the rural artisans through E-commerce. Strengths, Weaknesses, Opportunities and Threats/Challenges faced or to be faced by rural handicraft artisans adopting E-commerce have also been analyzed in this paper. Key words: Handicrafts, E-Commerce, Rural Artisans, Rural Development, SWOT Analysis Policy.

Jehangir Bharucha Proposed about Companies having a presence in India are making strong efforts to tap the vast potential of the Indian rural market. The paper explores how Hindustan Unilever (HUL) has been successful to have an impact in the rural segment of the Indian market through effective marketing and advertising strategies. It has tapped the bottom of the pyramid market in rural India very effectively by creating capacity to consume. Much of the subject matter of this paper has been gained through personal observations of the author who is into academics since the last twenty years, and on the basis of personal contacts with the top management in HUL.

Dr. Rashmi Gujrati explains different types of strategies to be adopted for grapping growing market in rural areas by the firms for being successful in their business. How they should make the products for low income group and attract them towards their product. What should they communicate or advertise their product in rural market is also discussed. Rural Marketing is growing at very fast rate and this is very important area to focus by the firms to do business in villages. In India 60 % of population lives in villages and their demand is also increased post 1990's compared to urban areas The main aim of this study is to observe the potentiality of Indian Rural Markets and finding out various problems are being faced by rural markets. This paper attempts to look into the challenges and opportunities of Indian rural marketing. Rural markets offer a great scope for a concentrated marketing effort because of the recent increase in the rural incomes and the likelihood that such incomes will increase faster because of better production and higher prices for agricultural commodities.

III. PROPOSED SYSTEM

The proposed system described in our work is intended to avoid car accidents happening due to Irregular Maintenance. which means Braking problems, Airbag Issues, Fire Accidents, and Tyre Pressure Issues. The Proposed system consists of Four monitoring systems are

- Oil Brake failure Monitoring system
- Airbag system failure Intimation system
- Fire Detection Monitoring system
- Tyre Pressure Intimation system

The Automobile Enhancement System employs NodeMCU and IoT-connected sensors to enable seamless communication between various components, ensuring accurate data transmission and reliable monitoring. This integrated approach facilitates easy maintenance and monitoring, enhancing vehicle reliability. Sensors and controllers installed in the vehicle send data to Thingspeak, redirecting it to a dedicated webpage for real-time monitoring. This webpage serves as a central hub for users to access and interpret data, seamlessly integrated into a developed application for convenient monitoring on preferred devices. By providing immediate insights into the vehicle's status and performance, this system promotes proactive maintenance, ultimately enhancing safety and efficiency on the road.

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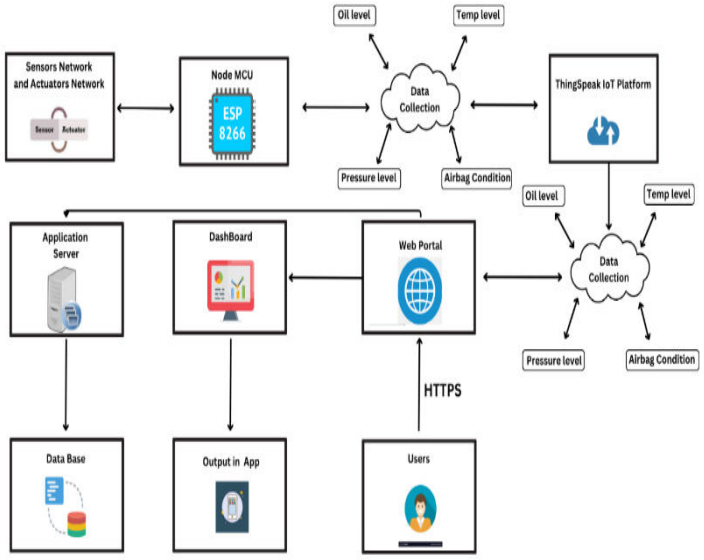

Fig.3 – Block diagram of Automobile Enhancement using IoT

3.1 SOFTWARE WORKING

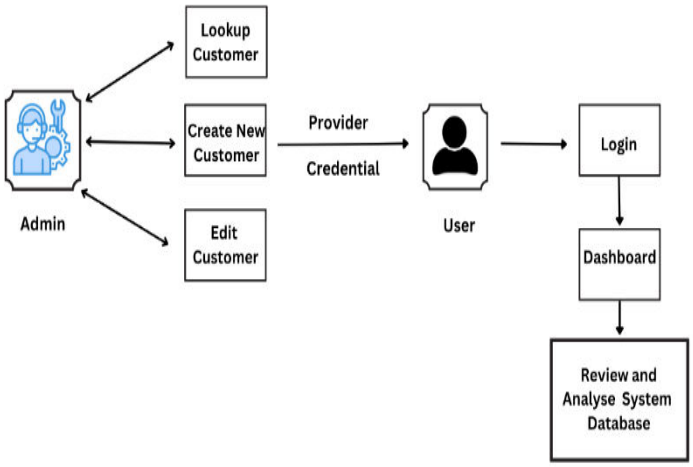

Fig.3.1 – Block diagram of Software

The representation of the CRM system flowchart outlines a streamlined process for user interaction and data management. Users are empowered to create new customers, providers, and user credentials, making customer relationship management easier. Admin possesses the capability to edit customer and user information and check accuracy and relevance within the system. Additionally, users can review and analyze data stored in the CRM system's database, enabling informed decision-making and strategic planning. overall, the CRM system clarifies a comprehensive approach to customer relationship management, emphasizing user accessibility, data integrity, and streamlined processes.

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IV. METHODOLOGY

The methodology for the proposed solution integrates IoT technology and real-time data transmission in a series of interconnected steps to enhance car safety and maintenance practices. Initially, sensors and controllers are seamlessly integrated into the automobile system, utilizing NodeMCU for communication, particularly focusing on detecting brake failures by monitoring the oil level system continuously.

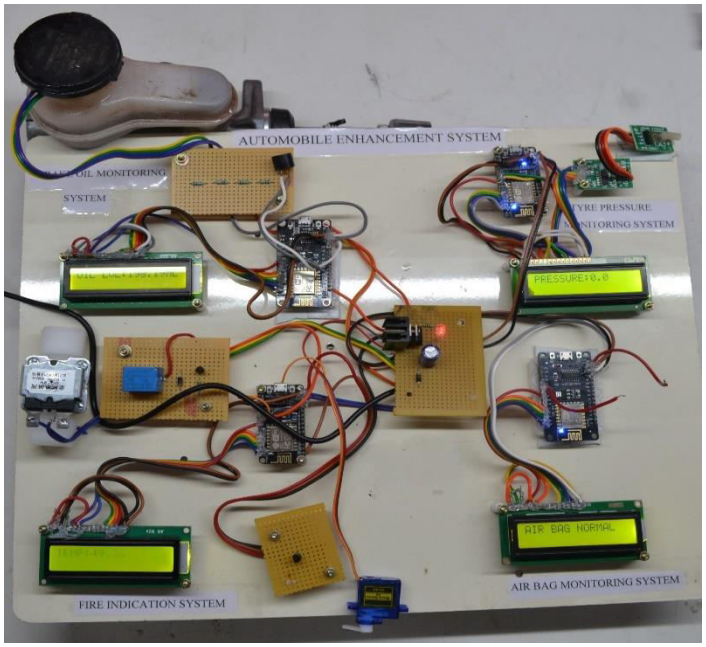

Fig.4.1 – Hardware Setup

The collected data is then transmitted accurately through IoT protocols to ensure reliable monitoring, facilitated by Thingspeak as an intermediary platform, directing sensor data to a dedicated webpage. This webpage provides users with immediate access to real-time car data, while a developed mobile application offers a user-friendly interface for monitoring the vehicle's condition conveniently. Overall, this comprehensive approach leverages IoT technology, sensor integration, and intuitive interfaces to optimize both safety and maintenance efficiency for automobiles.

V. CONCLUSION

The proposed software system utilizes IoT technology and real-time data analysis to tackle irregular maintenance and accidents in automobiles effectively. Various sensors connected to a NodeMCU monitor critical parameters such as brake oil level, fire detection, tyre pressure, and airbag flow condition continuously during vehicle operation. By specifically focusing on potential brake failures through oil level monitoring, the system aims to boost reliability and safety. Sensor data is transmitted accurately through IoT to a dedicated webpage via Thingspeak, allowing users to access real-time car data conveniently through a developed mobile application. This comprehensive solution not only seeks to reduce accidents and irregular maintenance but also optimizes driving conditions, thereby enhancing overall car safety and maintenance efficiency.

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