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# Revolutionizing Land-Based Vehicle Parts Management: Basis for a Unified Digital Platform for Auto Parts Information Systems

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**Abstract:** *The study provides the basis for a much-needed digital platform one that is consumer-friendly by examining current practices, pain points, and stakeholder requirements. This marketplace aims to aggregate the information of all of the autoparts dealers, suppliers, distributors, and manufacturers centrally for collaboration. Our goal is to reduce TCO and time associated with data access/wait times for real-time insights around inventory management, supply chain visibility, and actionable insights. This study is designed to save the face of the land and rarity-based car parts management at the end, foster efficiency in the automotive industry while taking on sustainability. To be a highly effective, secure and scalable "Autohub System" the design is implemented using several strategies and tactics in database domain.In order to reduce redundancy, this entails using a Relational Database Management System (RDBMS) such as MySQL and implementing strategies such table definition, relationship building, and normalization. Indexing helps enhance efficiency while looking for information and to model the autoparts ecosystem we use Entity-Relationship Diagrams (ERD). For stronger security against attacks and availability of data some methods used are concurrency control, adequate back-up and recovery procedures, and encryption of data. Performance tuning and considering scalability are other topics as they focus on the efficiency of work and further increase in the company's possibilities, whereas data auditing gives them accountability. Altogether these strategies can accurately set the database to cater for the goals that the autoparts management system has to accomplish. It's the exact same concept with the Autohub System which revolutionizes the conventional autoparts management sector by producing IoT and predictive maintenance, making operations smoother while eliminating waste. It is beneficial for many businesses as they experience reduced costs, less downtime, and an overall increase in productivity. This is true because the indicated system enhances earth-friendly causes since the automotive industry it fosters is more competitive because of worldwide cooperation. The newly introduced system, the Autohub System, has posed a major change in the ways businesses within the autoparts management industry operate today. This is achieved through offering real-time information, supplier control and a clear and user-friendly front-end in order to ensure that it facilitates the tends, procurement and cooperation. Through sustained supplier dynamics, buy order optimization, and analytical proficiency, decision making becomes enhanced tremendously. The long-term feasibility is guaranteed by the very fact of the opportunity to expand on it and adapt to new needs. This technology takes autoparts management to a new level because it has an overall positive impact on the functions of decreasing downtime, improving supplier interaction, and improving the supply chain. Summing up, The Model T exemplifies the milestone in progress toward sustainability and efficiency that shapes the future of the automobile industry.*

**Keywords**: Vehicle Parts Management, Digital Platform, Auto Parts Information Systems, Supply Chain Optimization, and Data Integration.

## I. INTRODUCTION

The use of technology and perception of customers are the two factors that are bring massive disruption in the automobile industry. Auto parts management in the industry's supply chain is an essential aspect of this transition. Autoparts existent management methods commonly lead to suboptimal outcome in the following paradigms due to manual operations, poor systems integration, and limited supply chain transparency: To producers, suppliers, distributors, and retailers of autoparts, essentially for the land-based vehicles, the complexity of managing autoparts entails a number of challenges each in the aspects of sourcing, procurement, inventory management, and distribution.

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Climbing for more people, it becomes clear that it is challenging to solve these difficulties with traditional methods and new creative digital solutions are needed to change management of autoparts in procedures. The economic impact of the supply chain management of the autopart involves such areas as; There is a high efficiency realized due to the enhanced end to end operation, more visibility which entails that there is pro-active collaboration revealed by the various supply chain applications which act as an efficient digital platform for information systems. With the help of converting autoparts data to this platform, stakeholders can get real-time access for data analysis and various decisions, optimize storage and logistics, and subsequently improve supply chain communication with the help of blockchain, big data, cloud technologies, and the Internet of things. Such a platform may well be the genesis of a revolution in the automotive industry that is positioned for future growth, stability, and competitiveness on the international stage.

## II. OBJECTIVES OF THE STUDY

The study aims to achieve the following objectives:

- To assess the opportunities and challenges faced by Automobile Shops and Companies
- To propose a unified digital platform for enhancing efficiency and collaboration across various sectors, the project envisions a comprehensive solution that integrates cutting-edge technologies.
- To formulate recommendations for the improvement of auto mobile shops and companies.

## III. RELATED LITERATURE

### 3.1 An overview of recent literature on spare parts inventories

The principles governing spare parts inventories are distinct from those governing work-in-progress and other inventories, and spare parts stocks are not intermediate or final items to be sold to a customer. The work by Kennedy et al. An update on the topic of maintenance inventories and the necessary future research is provided in 2002. Following a study of the particular features of spare parts inventories, management concerns, age-based replacement, multi-echelon issues, obsolescence issues, repairable spare parts, and special applications are covered in the literature.

### 3.2 Spare parts inventory control considering stochastic growth of an installed base

Installed base is a metric that indicates how many actual units of a certain system are in use. Inventory control of spare parts is critical to maintaining the functioning of the installed units and becomes more difficult as the installed base varies over time. This issue frequently arises when a producer begins to ship a new product to a customer and promises to supply replacement parts in case the item fails later. The ensuing non-stationary stochastic maintenance demand requires the careful development of a spare parts control method. The objective is to keep spare parts inventory control costs as low as possible while yet enabling customers to get replacements on schedule.This work is by Jin, T. and Liao, H. (2009) offers a model for the total maintenance demand produced by a product with uniform Poisson process growth over its installed base. The mean and variance of the aggregate maintenance demand are found to have closed form solutions for a particular case where the product's failure time follows the exponential distribution. A dynamic (Q, r) restocking policy is developed based on the model and solved by applying a multi-resolution technique. The suggested method's application in managing spare parts inventory under a service level constraint is illustrated by two numerical examples. To investigate the efficacy of the multi-resolution technique, simulation is used.

### 3.3 Forecasting Spare Parts Demand Using Statistical Analysis

In the majority of industrial businesses, spare parts are absolutely necessary. Their quantity and significant influence on the business operations when called upon define them. As a result, businesses typically examine their demand for spare parts and make projections on their future usage. However, they encounter challenges in devising an ideal forecasting technique that addresses the irregular and sporadic requirement for replacement parts. This work by Porras, E. and Dekker, R. In 2008, we compared five forecasting techniques using three statistical tools: mean squared error (MSE), mean absolute deviation (MAD), and mean error (ME). The findings indicated that all of the techniques performed similarly when it came to their ideal parameters and the frequency of the demand for spare parts.Thus, in order to minimize the average number of out-of-controls, we suggested comparing all of the strategies based on the tracking signal. This strategy was put to the test at a nearby paper mill company through a comparative analysis. According to

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our research, using the tracking signal strategy can assist businesses in choosing the best forecasting technique and lowering forecast mistakes.

### 3.4 A New Approach of Forecasting Intermittent Demand for Spare Parts Inventories in the Process Industries

Precise demand prediction is crucial for inventory control of spare parts in process industries, and demand forecasting for spare parts is particularly challenging due to their intermittent nature. There is now more data and information accessible to increase forecasting accuracy due to the widespread use of information technology in company management. In this HUA paper, z. s. et al. (2007), we create a novel method for predicting the sporadic need for replacement parts. During forecasting occurrences of nonzero demands over lead times, the suggested approach offers a mechanism to combine the demand autocorrelated process and the relationship between explanatory variables and the nonzero demand of spare parts. Additionally, two kinds of performance metrics for evaluating forecasting techniques are explained.

## IV. METHODOLOGY

### 4.1 Research Approach

This research study employs a combination of analytical and descriptive methods. In order to explain the structure of the platform and its conceptual basis, the following qualitative methods like expert interviews as well as literature reviews will be used. Secondary data in the form of questionnaires that would focus on documenting the experiences and expectations of the industry member concerning autoparts management will be used to gather quantitative data. The impact of the online platform shall be determined through various data analysis techniques. This would therefore be the rationale why a specific goal of a mixed-methods approach is to offer such insights that result in change to the management of parts of land based vehicles.

### 4.2 Survey Questionnaire

Stakeholders in the autoparts sector, insights about current procedures, or difficulties concerning the digital platform and expectations would be collected in a survey questionnaire for the system. It would have questions on productivity gain, errancy in supply chain visibility, challenges, past use of digital platforms, perceived benefits, likelihood of implementation, and key benefits. Other Types of questions could include requests for more information/feedback or here are some other ideas. The aim of this small survey is to gather necessary information when developing the united virtual workplace.

### 4.3 Participants of the Study

It follows those origins of professionals and stakeholders for the system are typically found in the autopart sector. This is comprised of the workers, materials suppliers, supply distributors, retailers, and other related groups in the automotive industry. Other people who may also participate include experts in platforms that are digital, database management and any technological expertise. It is due to this diversity that researchers get adequate insights about the basic practices of autoparts management and the potential gains derivable from a central technology application. Getting feedback at the stakeholders' level gives an insight and ideas that concern the formulation and implementation of the above proposed solution.

### 4.4 Sampling Method

Another type of sampling that was applied in the system is purposive sampling, which determines participants who have adequate knowledge and experience in digital technology integration and managing operations on automobile parts. I: One-way researchers can approach the right target group is through individuals who work directly in the autoparts sector; this will include manufacturers, suppliers, distributors, retailers and tech-savvy experts in the line of autoparts. From purposefully enlisting participants who are associated with differing roles and experiences in the industry, researchers are therefore able to assess stakeholder perceptions and autoparts management effectively. Snowball sampling can also be used to identify other individuals who might also meet the inclusion criteria by recruiting participants with referrals. Research workers may then ensure that the participants in the study provide

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meaningful responses towards the development of the unified digital platform for autoparts information system using purposively and snowballing sampling.

### 4.5 Data Gathering Procedure

A specific technique of sampling namely purposive sampling has been adopted while choosing the participants in the process of data collection of the system proposing various digital technologies for integration and better management of autoparts companies. Whereas, the semi-structured interviews are conducted to understand the nature of demand and pressures, the surveys are administered to know the extent of proper management practices and the expectations that the participants hold for the digital platform. Research themes are derived from survey data analyses using quantitative research based on responses obtained from survey forms and qualitative research based on interviewing some of the respondents. To establish validity of data collected, different techniques are applied and a comparison is made on the different approaches used. In light of the outcomes, the comprehensive and detailed report containing analysis and recommendations regarding the creation of the unified digital platform is produced. The research believes that such a process will help get interesting information which will guide the platform design and implementation process.

### 4.6 Data Analysis

Two methods of data analysis are used in "Revolutionizing Land-Based Vehicle Parts Management": quantitative and qualitative. To find patterns and trends in the autoparts management procedures and stakeholders' expectations for the digital platform, quantitative survey data is statistically examined using frequency distribution and the computer weighted mean score.

**Table 1:** The Interpretation of Range of the Weighted Mean

| Range of the Weighted Mean | Interpretation |
|---|---|
| 4.51 – 5.00 | Strongly Agree (for the questions asked) |
| 3.51 – 4.50 | Agree (for the questions asked) |
| 2.51 – 3.50 | Neutral (for the questions asked) |
| 1.51 – 2.50 | Disagree (for the questions asked) |
| 1.50 and below | Strongly Disagree (for the questions asked) |

## V. RESULTS AND DISCUSSION

As outlined in the methodology chapter, this chapter is the central part of the study whereby find out the results and discuss the findings from the analyse data to respond to the objectives of the study. The participants' roles and events during the implementation process are outlined as well as significant areas of focus such as the use of digital technology, challenges, and perceived benefits. To enhance practical usability of the obtained results, it is appropriate to situate them within trends of the industry, emphasise potential implications, and offer valuable recommendations regarding further management of autoparts.

### 5.1 Demographics Profile of the Respondents

**Table 2:** Profile of the Respondents in terms of their company

| Company | frequency | Percentage % |
|---|---|---|
| Mitsubishi Motors | 1 | 14% |
| Toyota Butuan City Satellite Surigao Auto City | 1 | 14% |
| Highwaystar Accessories and Autoshop | 4 | 57% |
| Ford | 1 | 14% |
| **Total** | **7** | **100%** |

The table shows that Highwaystar Accessories and Autoshop has the most significant presence, appearing four times and accounting for 57% of the total. Mitsubishi Motors, Toyota Butuan City Satellite Surigao Auto City, and Ford each

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appear once, representing 14% each. Overall, Highwaystar Accessories and Autoshop dominates the dataset, while the other three companies have equal but lesser involvement.

**Table 3:** Profile of the Respondents in Terms of Location

| Location | Frequency | Percentage % |
|---|---|---|
| Barangay Luna, Surigao City | 1 | 20% |
| Km 3, Barangay Luna, Surigao City | 1 | 20% |
| Km 5, Barangay Luna, Surigao City | 1 | 20% |
| Surigao City | 2 | 40% |
| **Total** | **5** | **100%** |

The table shows that Surigao City is the most frequently mentioned location, appearing twice and accounting for 40% of the total. Barangay Luna, Surigao City, Km 3, Barangay Luna, and Km 5, Barangay Luna, Surigao City, are each mentioned once, representing 20% each. This indicates that while Surigao City is the predominant location in the dataset, specific areas within Barangay Luna also have significant but equal representation.

**Table 4:** Profile of the Respondents in terms of years in business operation

| Number of Years in Business | frequency | Percentage % |
|---|---|---|
| Less than 1 Year | 0.875 | 12.5% |
| 1 -3 years | 0 | 0% |
| 4 – 6 years | 4.375 | 62.5% |
| 7 – 10 years | 1.75 | 25% |
| 11 years and above | 0 | 0% |
| **TOTAL** | **7** | **100%** |

The table shows that most businesses (62.5%) have been operating for 4-6 years, indicating a significant concentration in this range. Businesses in the 7-10 years category make up 25%, while those operating for less than 1 year account for 12.5%. No businesses fall into the 1-3 years or 11 years and above categories, highlighting a gap in these duration ranges.

**Table 5:** Number of Employees in the Business

| Number of Employees in the Business | frequency | Percentage % |
|---|---|---|
| Company 1 | 7 | 4% |
| Company 2 | 8 | 5% |
| Company 3 | 10 | 6% |
| Company 4 | 13 | 8% |
| Company 5 | 15 | 9% |
| Company 6 | 20 | 12% |
| Company 7 | 100 | 58% |
| **Total** | **173** | **100%** |

The table shows the employee distribution among seven companies, with Company 7 employing the majority (58%) of the total 173 employees. The remaining companies have significantly fewer employees, ranging from 7 to 20, each representing 4% to 12% of the total workforce. This indicates a substantial disparity, with Company 7 dominating in size. Understanding this distribution can help guide resource allocation and workforce planning to better address the diverse needs of these companies.

### 5.2 Challenges and Opportunities of the Automobile Shops and Companies in Surigao City

**Table 6:** The Positive Impact of Digital Transformation in the Business

| Positive Impact of Digital Transformation in the Business | Frequency | Percentage | Rank |
|---|---|---|---|
| 1.a. Digital tools and automation streamline processes, reducing manual tasks and improving operational efficiency. | 6 | 75% | 1 |
| 1.b. Digital channels, such as websites, mobile apps, and social | 5 | 63% | 2 |

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| | | | |
|---|---|---|---|
| media platforms, enable businesses to interact with customers more effectively. | | | |
| 1.d. Digital technologies enable businesses to adapt more quickly to changing market conditions and customer demands. | 5 | 63% | 2 |
| 1.c. Data analytics tools and techniques enable businesses to make informed decisions, identify opportunities, and mitigate risks. | 3 | 38% | 3 |
| 1.e. Cloud computing, agile methodologies, and collaborative tools facilitate rapid prototyping, experimentation, and innovation. | 3 | 38% | 3 |
| 1.f. Others | 1 | 13% | |
| **Total** | **23** | **100%** | |

The table highlights the significant positive impacts of digital transformation in business, with streamlining processes through digital tools and automation being the most frequently cited benefit (75%). Enhanced customer interaction via digital channels and the ability to quickly adapt to market changes are also highly valued (63% each). Data-driven decision-making and fostering innovation through cloud computing and agile methodologies follow, each cited by 38% of respondents. These benefits collectively emphasize the importance of efficiency, agility, customer engagement, and innovation in leveraging digital technologies for business success.

**Table 7:** The Market Trends or Emerging Technologies for Growth Opportunities

| **Are there specific market trends or emerging technologies that you believe present growth opportunities?** | **Frequency** | **Percentage** | **Rank** |
|---|---|---|---|
| 1.a.Applications include intelligent virtual assistants, predictive maintenance, personalized recommendations, and autonomous systems. | 6 | 75% | 1 |
| 1.b. Opportunities include smart homes, industrial automation, asset tracking, and smart cities. | 2 | 25% | 2 |
| 1.c. The rollout of 5G networks promises ultra-fast data speeds, low latency, and high connectivity, unlocking opportunities for innovative applications. | 5 | 63% | 2 |
| 1.d. Edge computing brings processing power closer to the data source, reducing latency and enabling real-time analysis and decision-making. | 2 | 25% | 3 |
| 1.e. Digital health technologies, such as telemedicine, wearable devices, and health monitoring apps, are transforming healthcare delivery and patient care. | 3 | 38% | 4 |
| 1.f. Others | 0 | 0% | |
| **Total** | **18** | **100%** | |

The table identifies key growth opportunities in emerging technologies, with intelligent applications like virtual assistants and autonomous systems leading at 75%. The rollout of 5G networks, promising ultra-fast speeds and low latency, follows at 63%. Digital health technologies, including telemedicine and wearable devices, are noted by 38% for transforming healthcare. Opportunities in IoT, such as smart homes and industrial automation, and edge computing, which enables real-time data processing, each garnered 25%. These trends underscore the potential of AI, high-speed connectivity, and innovative health solutions to drive business growth and efficiency.

**Table 8:** Game-Changer Emerging Technologies

| **What emerging technologies do you see as potential game-changers for your business in the next 2-3 years, and how do you plan to leverage them?** | **Frequency** | **Percentage** | **Rank** |
|---|---|---|---|
| 1.a. The transition to electric vehicles is a significant trend in the automotive industry, driven by environmental concerns and | 6 | 75% | 1 |

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| | | | |
|---|---|---|---|
| government regulations. | | | |
| 1.b. Automotive companies can leverage these technologies by investing in research and development, partnerships with tech firms, and integration of autonomous features into their vehicle models. | 5 | 63% | 2 |
| 1.c. Connected car technologies, enabled by IoT, allow vehicles to communicate with each other, infrastructure, and external services. | 2 | 25% | 2 |
| 1.d. Leveraging IoT capabilities can provide opportunities for innovative services such as predictive maintenance, remote diagnostics, and personalized in-car experiences. | 2 | 25% | 3 |
| 1.e. Investing in research and development of advanced materials can lead to lighter, stronger, and more sustainable vehicle designs. | 3 | 38% | 3 |
| 1.f. Others | 0 | 0% | |
| **Total** | **18** | **100%** | |

The table highlights key game-changing technologies for the automotive industry in the next 2-3 years, with the transition to electric vehicles (75%) driven by environmental concerns and regulations leading the way. Companies plan to leverage these trends by investing in R&D, forming tech partnerships, and integrating autonomous features (63%). Advanced materials for sustainable vehicle designs (38%) and connected car technologies enabled by IoT (25%) are also seen as significant opportunities. These innovations aim to enhance vehicle performance, sustainability, and user experience, emphasizing the industry's focus on innovation and connectivity for future growth.

**Table 9:** The Challenges in terms of Operational Efficiency and Collaboration

| **What challenges do you currently face in terms of operational efficiency and collaboration?** | **Frequency** | **Percentage** | **Rank** |
|---|---|---|---|
| 1.c. Poor communication practices, such as unclear expectations or limited feedback mechanisms, can lead to misunderstandings and conflicts. | 6 | 75% | 1 |
| 1.a. Departments or teams working in isolation without proper communication or collaboration can lead to inefficiencies and duplicated efforts. | 3 | 38% | 2 |
| 1.b. Reliance on manual processes and paperwork can slow down operations and increase the likelihood of errors. | 3 | 38% | 2 |
| 1.d. Outdated or legacy systems may lack the capabilities needed to support modern workflows and collaboration requirements. | 3 | 38% | 2 |
| 1.e. Limited access to information, time zone differences, and communication barriers may hinder effective collaboration among remote team members. | 0 | 0% | 4 |
| 1.f. Others | 0 | 0% | |
| **Total** | **15** | **100%** | |

The table identifies key challenges to operational efficiency and collaboration, with poor communication practices, such as unclear expectations and limited feedback mechanisms, being the most significant (75%). Additionally, 38% of respondents cited departmental silos, reliance on manual processes, and outdated legacy systems as major issues. These challenges lead to inefficiencies, errors, and reduced productivity. Addressing these issues requires improving communication, fostering cross-departmental collaboration, automating processes, and updating systems to support modern workflows. Remote collaboration barriers, while not currently cited, remain a potential challenge in a globally distributed workforce.

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**Table 10:** The Impact and Challenges of Consumer Behavior on Business

| How have changes in consumer behavior affected your business, and what challenges have arisen as a result? | Frequency | Percentage | Rank |
|---|---|---|---|
| 1.a. Changes in consumer behavior, such as the increasing preference for online shopping, can pose challenges for brick-and-mortar retailers. | 6 | 75% | 1 |
| 1.c. Social media platforms play a significant role in shaping consumer preferences and purchasing decisions. | 6 | 75% | 1 |
| 1.b. Businesses may struggle to collect and analyze customer data effectively to deliver personalized products, services, and marketing messages. | 2 | 25% | 2 |
| 1.d. Businesses may face the challenge of aligning their products, processes, and messaging with sustainability goals and communicating their commitment to responsible business practices. | 2 | 25% | 2 |
| 1.e. Businesses may struggle to integrate their various sales and service channels to provide consistent and cohesive customer experiences. | 2 | 25% | 2 |
| 1.f. Others | 0 | 0% | |
| **Total** | **18** | **100%** | |

The table highlights those changes in consumer behavior, particularly the preference for online shopping and the influence of social media, are the top challenges for businesses (75% each). These shifts necessitate robust online platforms and active social media engagement. Additionally, 25% of respondents identified struggles with effective customer data analysis, aligning with sustainability goals, and integrating sales and service channels. These challenges require businesses to develop strong digital strategies, utilize data effectively, commit to sustainability, and provide seamless omnichannel experiences to meet evolving consumer expectations.

### 5.2.1 Conceptual Framework of the Proposed Revolutionizing Land-Based Vehicle Parts Management: Basis for a Unified Digital Platform for Auto Parts Information Systems

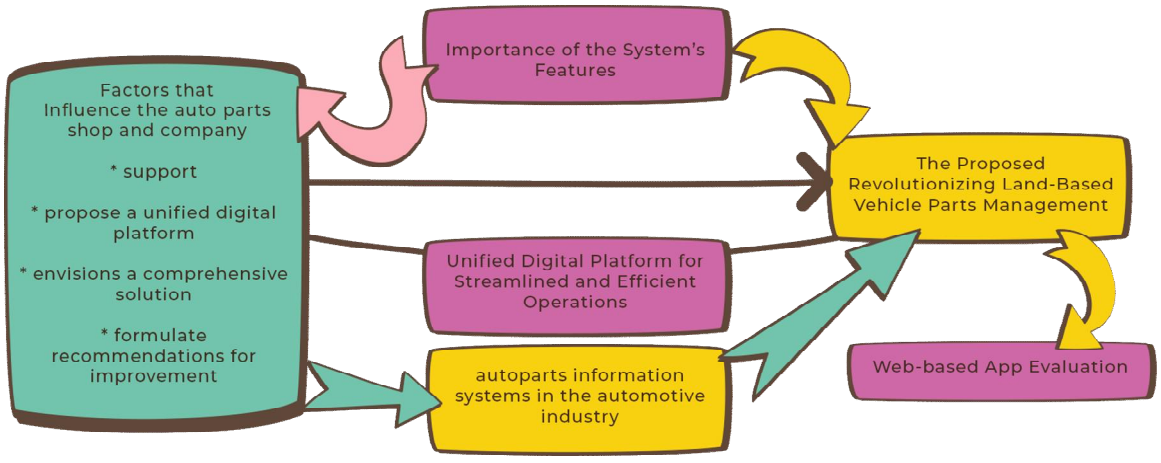


**Figure 1. 0** Conceptual Framework of the Study

The framework of the study focuses on the difficulties associated with managing autoparts, the integration of digital technologies, and the expected results of a single digital platform. Disjointed systems and ineffective inventory

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management are among the difficulties. Cloud computing and IoT are used in digital integration to overcome these issues. Stakeholder engagement, communication, and data sharing are made easier by the single platform. Enhanced decision-making, increased visibility, and simplified procedures are among the results. The study intends to improve the efficiency and sustainability of the automotive sector while revolutionizing the administration of autoparts. (see figure 1.0).

**5.2.2 System Development Process of the Proposed Unified Digital Platform for Auto Parts Information Systems**

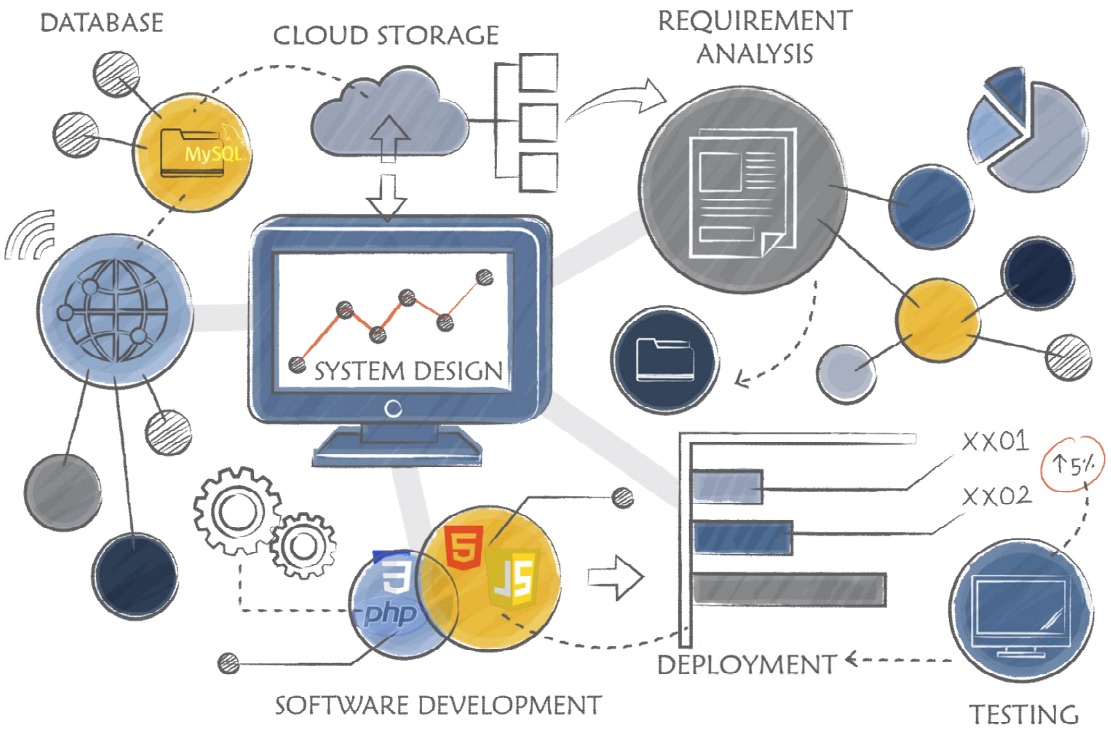


**Figure 2:** The Development Architecture of the Proposed System

The development of a Unified Digital Platform for Auto Parts Information Systems involves several critical stages. Initially, stakeholders are identified, and detailed requirements are gathered through interviews and surveys. System design follows, outlining high-level architecture and detailed specifications, including UI mockups and data models. The development phase encompasses frontend and backend coding, database setup, and system integration. Rigorous testing ensures functionality and performance, leading to deployment in staging and production environments. Post-deployment, the system undergoes monitoring, maintenance, and support, including bug fixes, enhancements, and performance optimization.

**5.2.2 Suggestions andRecommendation for Further Improvement of the Automobile Shops and Companies**

Consider broadening collaboration, with stakeholders such as manufacturers, distributors, retailers and end users to enhance the effectiveness of "Revolutionizing Land Based Vehicle Parts Management; Basis for a Unified Digital Platform for Auto Parts Information Systems." Utilize partnerships to access resources. Enhance real time insights through data integration and analytics while optimizing inventory management. Prioritize the development of user interfaces and mobile accessibility while reinforcing cybersecurity measures. Scale the platform to suit business

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requirements along with offering comprehensive training and support, for users. Emphasize sustainability by improving logistics' efficiency and implementing documentation practices.

## VI. CONCLUSIONS AND RECOMMENDATIONS

The system research concludes by highlighting the urgent need for a unified digital platform to address the difficulties and inefficiencies in the automotive industry's autoparts management. Improving supply chain visibility and inventory tracking are only two of the potential advantages of such a platform that have been identified through a thorough examination of present procedures and stakeholder viewpoints. The study's conclusions highlight how crucial it is to use digital technology to improve decision-making skills and expedite autoparts management procedures. In the future, land-based car parts management could undergo a revolution thanks to the creation and deployment of the unified digital platform, opening the door to greater productivity and industrial competitiveness.The system's recommendations are focused on creating and executing a single digital platform to efficiently handle autoparts management issues. To guarantee the platform's success, industry stakeholders must work together, which calls for open communication and participation throughout the development process. In order to increase acceptance rates among stakeholders, the platform should also give priority to user-friendly interfaces and straightforward functionalities. Furthermore, it is recommended to incorporate continuous feedback methods to enable constant updates and enhancements that are informed by user experiences and changing industry requirements.

## VII. ACKNOWLEDGMENT

We extend our deepest gratitude to everyone who contributed to "Revolutionizing Land-Based Vehicle Parts Management: Basis for a Unified Digital Platform for Auto Parts Information Systems." Special thanks to our stakeholders, including manufacturers, distributors, retailers, and end-users, for their invaluable input and feedback, as well as to highway star Auto Parts and Accessories Shopour partner and collaborator in the automotive and technology sectors for their expertise and support. We also acknowledge our dedicated development team for their tireless efforts, our organizational leadership and funding bodies for their vision and resources, and our pilot program participants for their crucial feedback. Thank you all for your unwavering support and collaboration in making this vision a reality.

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