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# Smart Inventory Management System and Predictive Analysis

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***Abstract:*** ***The idea of a smarter inventory management and business intelligence systems is a challenge in its implementation for various organization and businesses especially small and medium sized retailers. The concept of the paper is based on the business aspects while it merges various technological features to make a Predictive Analytical Model. Very few organizations and companies implement this which amount to loss of business, redundancies and errors that can be largely solved by system that uses data science, machine learning and visualization. This paper aims to present various aspects that can be infused with technology to aid Business Techniques and enable automation.***

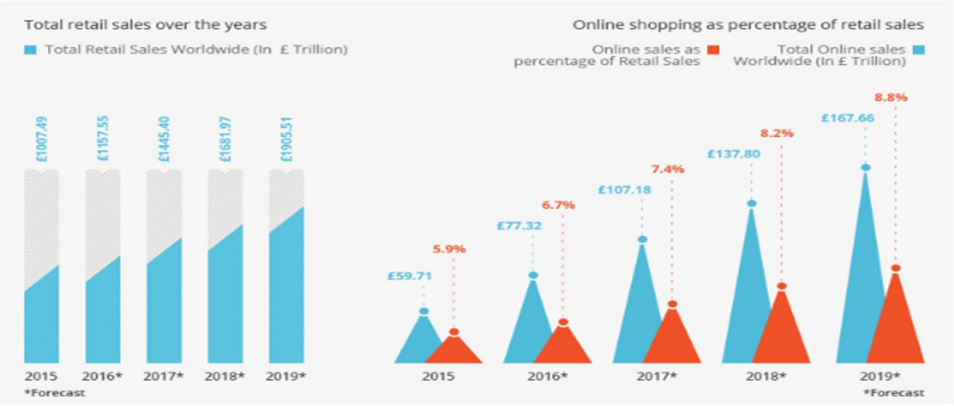
## I. INTRODUCTION

Artificial intelligence, machine learning and data science are helping a lot in today's world to revolutionize the knowledge technology trade and find innovative solutions to impact our lives. With all this happening in this area, it is very easy to improve the tools to create new ideas and concepts. A large number of machine learning and AI tools available widely also helps to gain insight from various sources and gather the information to make undescriptive information base to get the vital knowledge about the systems. This paper aims to discusses different techniques to the traditional inventory systems. The infusion of machine learning and AI into the business markets can allow us to analyze the efforts we put in and check aspects of business system, analyze business components and to the measure the amount and efficiency of the work.

Predictive analytics is a type of statistical technique for predictive modeling that uses machine learning and data mining that can analyze the trends and behavioral patterns from the data and extract it to make predictions about the future and other events that might occur. The instillation of machine learning into the inventory management system which is a software that is helpful for the businesses to operate the hardware or online stores where store owners keep records of sales, the bills and the purchases and allows to fuse with new visualization, analysis and learning tools. Also mismanaged Inventory may lead to disappointed customers, too much money is tied up in the business, the sales might be slower, the inventory may get wasted and we might not get efficient operations. Also, automation of work allows to remove human inefficiencies and boost overall output. This paper aims to be able to eliminate the paperwork the human's faults, the manual delays, the information gaps and place the missing processes that might help to speed up the different processes and make for more efficient business operations and better revenue. This will enable businesses to be ahead of the competition. The system allows to operate businesses and find information or labels about the data available along the transactions. The generation of data, data analysis and by using machine learning techniques, it allows to gain insight on the business and presents with different ways to analysis and manage business.

## II. MOTIVATION

The motivation of this paper is to provide the retailers a new way to interact with their inventory, business, employees and consumers in an integrated way. The paper presents the use of machine learning and other functionalities to allow retailers especially small sized and medium sized retailers to easily connect their business vertically and get them online. The different implementations will allow more efficient operations while boosting the business which constitute the majority of retail sales.




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The inventory system represents a necessary element of any business, organization or enterprise and its viability and analysis are offered as a result of accurate management determines the accomplishment of the target and therefore the monetary results.
Their efficient management of the operation requires overviewing and finding optimal level for all the assets available to the business which guarantees that work is efficient, economical and liquidity is maintained. This also means that we can maximize our profits by increasing the revenue and decreasing the operating expenditures.
The highlighting influence factor on the system is the management required for each level to oversee the operation and to analyze the work of the employees. The software allows to collect useful data that can allow to justify managerial decisions which allows for enhanced company operations, better financial position, faster execution and higher quality of work.
The individual login systems also allow to view the individual work of an employee in the organization and judge the sales made by him to different customers, how efficiently he/she acted and applied the processes. Using this we can achieve with less people by balancing the load between different people and removing the leads at each level Also they different queries of new friend employees go unanswered this can be solved using messaging systems that is universally connect that is a discussion for all to participate in the organization and solve the problem of your colleague without actually living the computer.

## III. EXISTING TECHNOLOGIES

The Existing technologies try to cater to large retailers and require a huge capital investment. The technologies used her use a combination of:

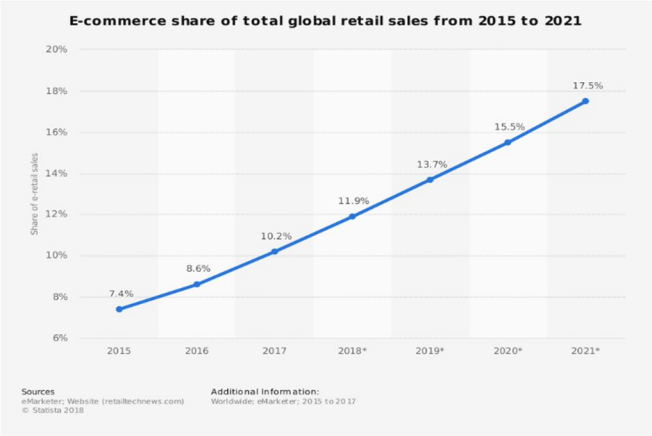
*A.* Analytics Tool
*B.* Customer Relation Management Software
*C.* Automation
*D.* E-Commercce

## IV. METHODOLOGY

The various features and principles are designed to improve existing technologies and add new ideologies to ease the process and automate certain components.

### *A. Automation and Efficient Operations*

While we can apply machine learning to our business systems to analyze our business processes, it can also allow to apply automated procedures to do certain processes, introduce new features and allow the hyper local connectivity of different shops and local subsidiaries of the organizations. The system allows to operate businesses and find information or labels about the data available along the transactions. The generation of data, data analysis and by using machine learning techniques it allows to gain insight on the business and presents with different ways to analyze business. We can bridge the gap between the business systems and the manual vote by using implications like business analysis and mental management employee throughput sales prediction pricing structures and all of this can be done using algorithms that perform on the data available which is collected while generation of all the transactions, creation of bills, addition of new items and remove items that constantly monitors the various changes in the system and makes genuine inference and statistical analysis to give some output.




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*B. Using tools to improve contemporary Manual Processes*

Instead of building end-to-end solutions to change whole elements of your business, a repetitive approach is cheaper and quicker to be enforced. for instance, we've got a manual method that simple tools are inserted to make that process faster. Over span of your time, as these tools get far more and more sophisticated, we would upgrade these analytics to automatize businesses.

*C. Easy Integration and Zero Infrastructure Costs*

Not only the businesses that are huge in size can employ these systems but also the smaller retailers example grocery stores, electrical stores, supermarkets, shops etc. can use a business management software to boost their business revenues without any investment into infrastructure. In various developing countries such as India, Taiwan, Brazil, Philippines etc. have a huge number of local retailers selling various services to its huge population which can use these systems integrated into their business which allows it to compete with the tools available and in-depth business analysis.

Also, the smart functions available with the software using the processing power from the modern devices and remote server allows to decrease the infrastructure cost and easily put new systems into the existing infrastructure with software upgrade rather than expensive hardware upgrades.

*D. Making Best Use of the Omnipresent Data*

The huge collection of data available makes the predictions and pricing analysis that can use similar business data that is trained into the predictor using machine learning. This allows to get the right prediction and allow to expand service. For example, a medicine store might also sell cold drinks that makes extra income which another medical store can use to earn more revenue.

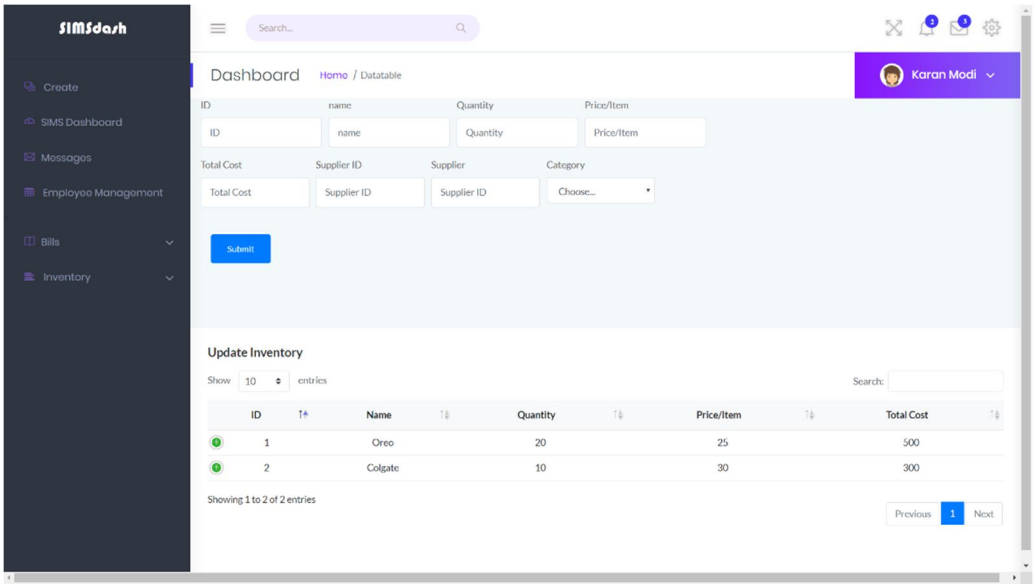
One of the few factors that Machine learning is dependent on is the accessibility of right information for a project paper. In today's age, data is all over and can adopt to any business. With their new advanced technologies such as huge data of information, cloud services, data mining and many more, data can be worked with.

*E. Analyzing and Auditing Processes for Potential Optimization*

We can measure these processes by the number of clicks and different levels, as well as interactions, supply and cycles. Those with the most numbers have the highest need and return on investment (ROI) can be prioritized. The analysis can show to work with different vendors and salesman or internally to develop solutions.

*F. Online Vertical Connectivity of offline stores*

The interconnectivity then can be used to allow businesses to become hyperlocal stores that provides services online by using the infrastructure of physical transportation and delivery individuals that can be provided by an organization that ties with the Business Analytics System. This creates a vertical connectivity of offline stores to online markets which allows them to compete to them.



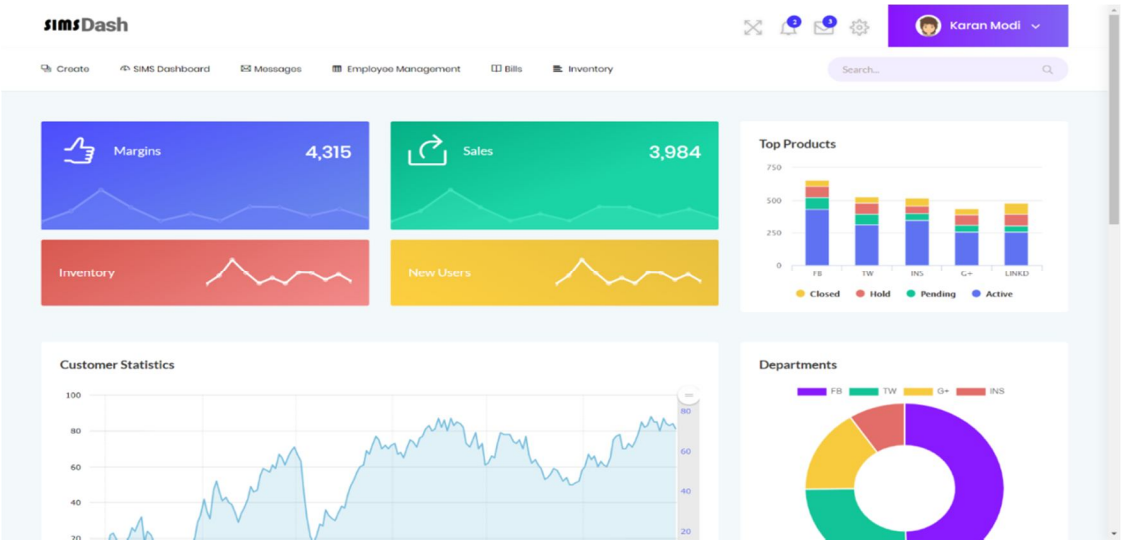

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*G. Visual Representation of Business Analytics*

In a study by different academics in China, the researchers worked with a concept called interactive model analysis and where Machine Learning is understood better through visual analytics on it . The authors pointed that the obscurity present when users work with machine learning through the huge data. To solve this, they made a thorough whole analysis with interpretation and categorized their work into three categorized in three parts:

*1)* Understanding
*2)* Analysis
*3)* Diagnosis

The Business Management System provides analysis in a convenient manner to the business and the concerned individuals in a easy way to interpret and also gives suggestions based upon those Analysis.




*H. Analyze Workforce and Their Output*

The main challenge is to deal with the human workforce and the throughput employees give. The automation of processes and analysis of the financial and skill review allows to increase the potential results of the organization. The humans are prone to error and require supervision to output the results. Both employee analysis and automation allow higher deployment and better operations. This in turn allows to make new opportunities using the help of the software and also gauge the workforce.

## V. CHALLENGES

*A.* Since we are handling sensitive information, data security is important.
*B.* Performance of the different systems is highly network dependent.

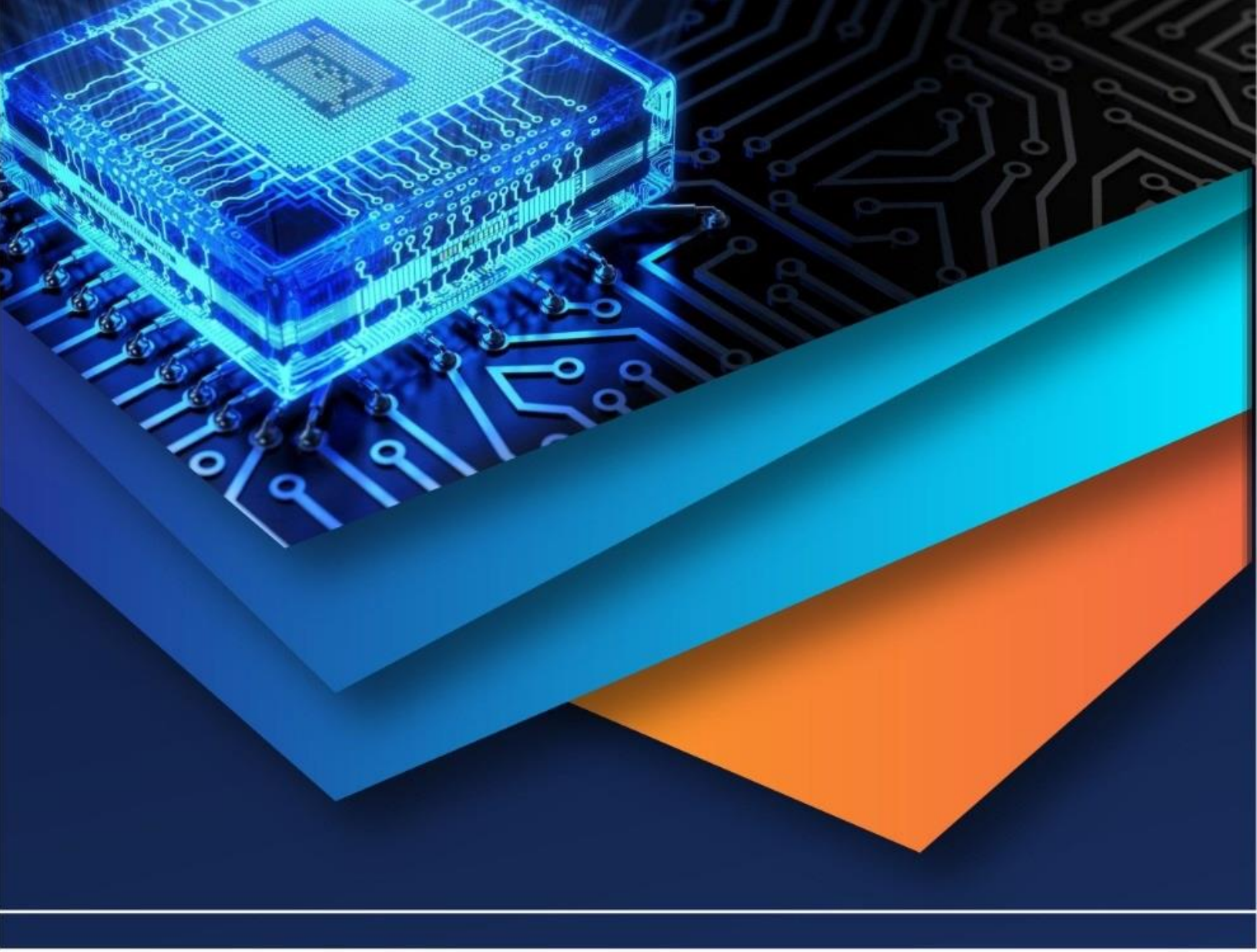
## VI. SCOPE OF THE PROJECT

*A.* It can be used to share business data
*B.* This will enable door to door service using contract or inhouse delivery
*C.* Data can be used for targeted marketing

## VII. CONCLUSION

The infusion of machine learning and AI is inventory and business intelligence systems will bring a change to how we prepare the huge amount of information that we have been collecting from different sources and then performing analysis on them. It will create a tool of process data to find out some gaps and missing links in the system. This will in turn expose to us to the flaws and generate a whole data to perform a comprehensive analysis and make the operations more efficient. The art of representing information and visualizing it using various tools can drastically improve business performance and make new opportunities by acting on the suggestions provided. The machine learning can help automate systems and analyze various components to make for leaner operations. The systems will allow smaller market players to integrate to online marketspace and also participate without investment on infrastructure using a revenue sharing structure. This will create new inroads for interconnectivity and sharing of business data to help boost businesses using competitive analysis and predictions using trained information.

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