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Artificial Intelligence in Enterprise Resource Planning Logistics

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Abstract*: *Enterprise Resource Planning system allows the various business departments, differentiated by various places or utilities or services provided, to mobilize vital information which helps them to in an integrated single system. Suppose we consider an ERP unit that enables flawless flow of information among its continuous system of a producing process, like spare parts buyer's facility, parts storehouse owned by producer, and producing and arranging unit. ERP allows us real time information transfer among various systems so as to maintain that the producing house has the required supply of necessary parts to ensure seamless working because of inadequate supply while also overcoming the problem of oversupply of parts.

Artificial Intelligence can be used along with ERP systems. Such AI-enabled ERP systems not only provide benefit to single application only but also put a major impact which is more than the sum of individual parts. The various amounts of benefits of using AI-based ERP system, which basically comes from the majorly three features:Minimize data entryIntelligent data processingIntegrated data analytics

***Keywords: AI, ERP*,**

I. INTRODUCTION

ERP is enterprise resource planning which provides a platform for various department of an organization to share information in real time. It is an interface for organization at various locations, inter-department communication and provides a check to the management to check. It helps to provide check and balances in the organization on real time basis. It brings in accountability at each and every level of organization. Each enterprise while making hierarchical structure wants to make a structure which will enable a static and constant business process, maximum utilization of available resources (both biotic and a biotic) and better reaction as per the needs of various departments or environments. Organisational structure needs change as and when the environment changes. Not only adaptable as per the reform or changes, but also simultaneously it will have to initiate, make and direct the reforms. Exactly if fall in demand it would cater to bring in instability of organisation, which will have to be handled for product manufacture, specialisation and cost effective.

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Hence, the main objective is to create a perfect harmony between adaptability and stability. Artificial intelligence,if we go by word meaning 'artifically' means not naturally occurring or which is induced by training and intelligence means the use of acquired knowledge and taking the best possible decision according to the scenario available or according to various environment parameter.

Artifical intelligence in electronic technology means to train the machine to analyse the required set of data from various sensors, through ICT, video cameras,etc.To take the required decision in the same circumstance or find the best possible solution for a particular situation via analysing all the possible permutation and combination from the acquired sample data.The tries to behave as a human performing some prejudiced pattern to a certain condition.

The problem faced by companies handling ERPs is that they have to make repeated entries for which they require huge staff. Secondly the problem faced by logistic company especially in B2B segment is that the decision to select which vehicle is suitable to transport the required material is done manually and sometime it has been observed that this leads to malpractices in an organisation. Third problem is that which route is best suited in order to maximise the profit for the organisation and reduce the consumption of resource which is beneficial for the entire society.

To overcome the aforesaid problems in existing ERP technologies the propose system includes AI based ERP system.

II. RELATED WORK

Dipti Srinivasan', along with his collegues[1] has proposed a map matching which is a 2nd Gen Road Pricing via the use of electronics(ERP) using Satellite Position System (GPS) and Machine Learning (AIML) techniques. This system will surpass the prevailing flaws in the present gantry based system. The work uses raw GPS Data to locate GPS data points on location route or traffic road.

This system in point to segment mapping accuracy was good. Developed software named ERPZ has produced accurate results during practical testing. The system uses GPS equipment, Map Database, software, ERPz. 27th International Conference on Information Technology interfaces in the year 2005 [2] the paper proposes to solve the problems in Croatian Enterprise of not being able to fulfill the demand of customers on time the paper structures a ERP for singular and multiple production and uses a AI& machine learning to generate new ERP via use of Three-tournament stable decision generic logically scheduling process for time and cost.

Hokey Min*,[3], the authors proposed to identify concepts of AI which can be used for Supply Chain Management services and to further use for increasing Supply Chain efficiency. Synthesise the applications of AI to SCM for practical implications. Create a horizontal taxonomy for AI, categorise it for it's application in SCM probleem extend, and working logic. To sum up the use of Artificial Intelligence in the field of SCM scope of areas and increase its efficiency.

6th International Confrence ECAI 2014[4] author proposes a problem in some of choicest Water Parks of Poland and their problem of using Enterprise Resource Planning (ERP). The author has analysed existing technologies. He has given a detailed analysis of Enterprise Resource Planning systems which are completely attached with H/w parts which can handle the day to day working of Water Park in comparison with present working model of Enterprise Resource Planning systems of Poland. Proposed that a decision achieved with the help of Bussiness of Intelligence (BI) systems is more accuarate. System collects the information from 12 selected software companies which dedicated to water parks management.

Guido Perboli1,2,3, Member, IEEE, Stefano Musso1,2, Mariangela Rosano1,2 [5]The author proposes to use Blockchain Technology to provide a marriage between Blockchain and Logistics.Use of Technology of Blockchain for SCM inorder make financial stability and maximization of profit with the help of use of Guest Technology which is the technical model and a sort of Bussiness Proces Modeliing,having shortages in field of a pre-defined method to design a Blockchain solution and merge it with Bussiness Strategies.

8th ISNE 2019 [6] Iincrease demand of logistics in China, present system has following drawback for present short-distance delivery in the actual market are less efficient, problems like labour cost and inefficiency is being overcome by the use of drones which uses AI in decision making for Express Delivery System to make it more cost effective and less cumber son system and hastle free delivery system.

In a paper presented by Mr.Rusul and his Team [7]. The author proposes to reduce the pollution caused by traffic with the help of like A.N.N., genetic G.A., Sims. Anneal S.A., A.I.S., Ant Colony Optimizer (ACO) and Bee Colony Optimization (BCO) and Fuzzy Logic Model (FLM) in transport system which will make our environment sustainable.

Kurniawa Engkos Achmad Kuncoro ; Bambang Dwi Wijanarko ; Ridho Bramulya Ikhsan [8] proposes the use of IoT in logistics department to bring in efficiency and cost effectiveness logistic management system with the help of external factors robotics and artificial intelligence.

Shihua Li ; Jing Yan ; Lingxi Li [9] explores the potential of automated guided vehicle to program UAV in the field of logistic with help AI algorithm and GPS and Mapping technique

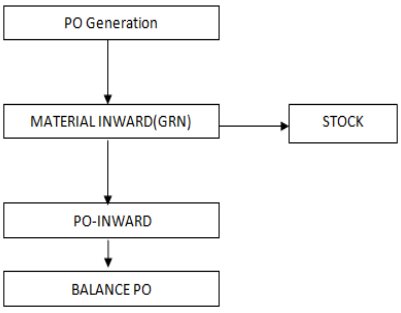
III. PROPOSED WORK

The AI in the field of ERP has the ability of self learning and evolving as improved data introducing w/o making extra effort for programing is the ultimate use of B.I...It is exactly what artificial intelligence and AIML offers: an ability which can escalate information-driven analysis and acquire vital information which is collected from various sources which were hitherto never collected, not every organizationhas the ability to put this valueable information into business profit or business use they don't have the required skill and analysis for it. The ability to analyse acquired information into a valuable business point which can be used to bring in a competitive edge over the market and rapidly transform the entire business world calculations.

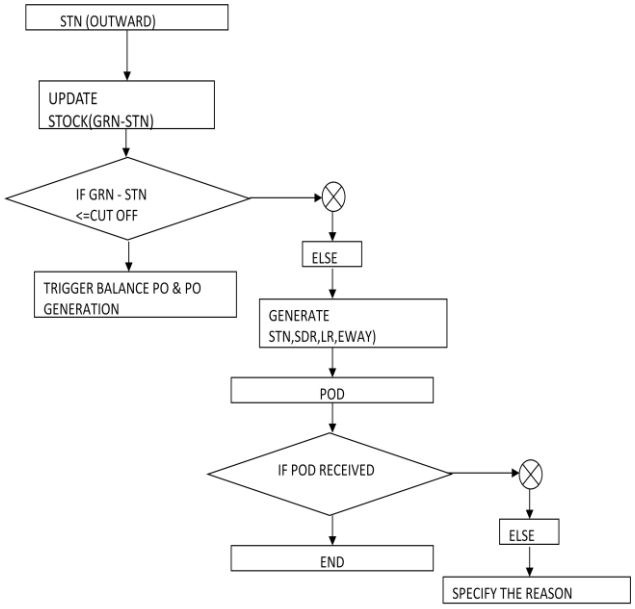
Information or modeling , can be divided in 3 main sub-parts:

Planned or Labeled or Supervise learning, in which data has input/output pairs: Each data pair is utilized to "train" AIML systems which recognizes certain rules of correlation or regression in between output and input .

- **Acquasition of information:-** Locate the data as per the problem statement which you are trying to solve and which will support you to solve. Information can come from varied sources, like Enterprise Resource Planning systems, from various sensors via Internet of Things, various devices or from database. The information can be both organized and unorganized.
- **Processing of Information:-** Organize the information as per the required for AIML execution which include transform of information, normalizing and cleansing, along with the selecting the no. of training pairs (Labeled Data).
- **Modeling the problem statement:-** Selecting the AIML logical programs which can be used for learning or clubbing. Many variety of algorithm may be used and can be extended to fit in for various objectives.
- **Validation & execution:-** Validating the outputs, finding appropriate base for executing models and algorithms, lastly executing the AIML systems. During executing the model there would arise much iteration of running the AIML system and fine-tuning & then again finding the outputs.
- **Deployment:-** Lastly, the result of AIML model are being deployed so that the business can find some value of the information and realize it to gain profits. These values of information can be used in decision-making, input for application or system, or can be used for future use. The result can vary as per the use of AIML algorithm used or different model usage which may supplement the existing result or applications on prediction model. The outputs can be in various forms, during deployment we have to decide how & where to deploy the model for consumptions & decision-making.



Flowchart for PO Generation and tally for Balance PO



Flowchart for STN

IV. RESULT

At the end of the research, it is expected that we completely satisfy our problem statement which stated that their should be minimization of data entries and in our system it was achieved by providing console sheet and search facilities which have reduced the man hours.

V. CONCLUSION

In this work, a AI-based ERP system for logistics company. The system has efficiently reduced the data entry efforts of the staff. The decision of selecting which vehicle to be used might be successfully tested and it can validate with physical model with existing compatible, operational framework and it lead to significant sustainable service model in logistics supply chain management system. This model can be expanded with need based customized adoption and will be supported of all allied industry services which are linked with logistics management which includes B2B, B2C and has shown good amount of accuracy

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