



A STUDY ON ANALYSING THE EFFECTS OF MULTI AGENT TECHNOLOGY IN THE PRODUCTION OF HIGH QUALITY PRODUCTS

Corresponding Author: Aftab Younis Student of Sirda Institute of Engineering Technology Himachalpradesh

Co-Author: Vikram Singh Professor at Sirda Institute Of Engineering Technology Himachalpradesh

Abstract

With The increase in the Competition in the market and advancement in the technology, the countries are prioritizing for intelligent and advanced technology in terms of manufacturing in order to improve product design and reducing the waster and improve the quality at the same time that results in economic growth and development. In this paper a similar attempt has been made to understand the impact of multi- agent technology by using the secondary data from various corporate. It was also observed that only those corporate have benefited from that had used it in true sense of technology. Some other corporate have failed to achieve what they had expected by adopting multi-agent technology for some reasons.

Key words. Business intelligence, Multi- agent, manufacturing operations, operational control and coordination.

I. INTRODUCTION

II. In a distributed computing system it may happen that the nodes in the network system can have different efficiency and the configuration's usual it is connected with the CPU , the quantum of RAM memory, operating and other factors. The network nodes get their tasks the working or distributed agent usually may not know how much time it will take to process it or Complete the assigned project. This information is made available after some time when the problem is solved. it is also important to note that during this process some of the nodes may get disturbed during the task solving.

III. A multi Agent technology is actually a system that is based on agents that perform or act like an individual. They have their own intuition or view point of the environment and can easily share it with other agents. This is a kind of static technology that can share its view with other agents. This is a kind of technology that may be used in the execution of s Distributed computing.

IV. Agent and Multi - agent system

V. The field of agents and multi agents systems is actually a part of an artificial intelligence that is mostly concerned with the object or project oriented programming and the user interface. It is important to note that

the Research work in the field of multi Agent system started in the early 70s but the boom in the research of multi Agent come from 80s.

VI. Agents

VII. It is important the mentioned here that the Concept of agent appeared first in the seventies. It is necessary to mention that code and data processing Propagation is a kind of technique that may be used in the distributing task between the Computers in the network system. There are so many definitions of the term agent that have been developed by various authors from time to time and there are many other great intellectuals that Believe that the term Agent has not been properly defined with letter and spirit. But some of the popular definitions are as:

VIII. LITERATURE REVIEW

IX. Hadavi et al. proposed a Multi- Agent distributed dynamic planning, scheduling and control system. Applications of MASs to production planning and control problems were summarized by Maria and Sergio. It was noted that its related research tended to be more diverse. Baker studied a MAS-based shop scheduling algorithm. Shaw proposed Agent-based production scheduling and control strategies. In his study, a manufacturing unit could subcontract its task as a subcontract to other manufacturing units by using a bidding mechanism. In the study of Wang et al., the Agent technology was used to solve real-time distributed intelligent manufacturing control problems. Wiendahl et al, studied a self-organizing production control system based on Agents. Multi-Agent-Based Production Planning and Control Butler proposed a Multi-Agent system architecture to solve distributed dynamic scheduling problems. In his study, the scheduling process was divided into two levels: the first layer was used to assign manufacturing units to jobs by using an Agent-based consultation mechanism, the second layer was adopted to allocate dynamically shared manufacturing resources. Shen and Norri proposed a hybrid Agent system architecture to solve scheduling and rescheduling problems.

X. Many Chinese researchers have additionally proposed exceptional MAS answers for manufacturing making plans and manage systems. In the look at via way of means of Zhang Jie, Li Penggen et al., digital production cells had been brought to address manufacturing making plans and manage method. The gadget consisted of a store ground layer, a digital mobileular layer and a useful resource layer. On the premise of this look at, some MAS-primarily based totally manufacturing making plans and manage answers have been evolved for fixing Job Shop, reentrant Manufacturing System, agile production systems, and different making plans and manage troubles for complicated production systems. Zhu Qiong, et al. proposed a Multi-Agent-primarily based totally collaborative negotiation mechanism for fixing dynamic Job Shop scheduling troubles. Zeng Bo, Yang Jianjun, et al. proposed a Job Shop scheduling and manage gadget that hybridizes a MAS-primarily based totally Generalized Partial Global Planning (GPGP) mechanism with a Task Analysis, Environment Modeling and Simulation (TAEMS) language. Liao Qiang et al. proposed a Multi-Agent-primarily based totally Job Shop dynamic scheduling version via way of means of the usage of subject bus. Gao Guojun et al. used Agent era to evolved a reconfigurable agency statistics gadget via way of means of the usage of Agent era. Liu Jinkun et al. proposed an Agent- primarily based totally metal business

manufacturing method manage gadget. However eminent scholars and experts have used many construction models initially with four dimensions that is optimism , innovation , insecurity and discomfort. This was initially used comprehensively used with collective approach to understand technology usage. Later many authors have used two dimensional modals along with meta analysis to understand the actual meaning and importance of technology usage . Jan et al., (1995) , have lime - lighted how the behavior of modern buyers is switching from traditional markets to modern and high - high technology markets . In this study a sample of 900 firms was drawn that were well equipped with modern work stations and advanced technology. A descriptive statistical model were used to test and check the hypothesis and it was observed that there is a rapid increase in the buyers behavior towards modern and well updated firms. This study has given an alarming signal to those venders who were still experiencing their traditional means of selling their goods and services. It was also an eye opener for firms to investigate and understand the essence of modern tools and technologies.

XI. Methodology

Population of the Study: The population for this study consists of five manufacturing FMCG companies that are using Multi-Agent Technology Since last four, five years and these companies are Hindustan UniLever Limited, ITC Limited, Nestle India, Dabur India Limited and Godrej Limited

Sample Size and Sampling Technique: As the data for this study have been collected from these companies from the last five years I.e. from 2016 to 2021 that is around 60 months .

Source and Method of Data Collection: As we know that it is only the data through which we can prove our hypothesis. There are two types of data viz. primary and secondary. **The primary data** are those which are collected a fresh and for the first time and thus happen to be original in character. The **secondary data**, on the other hand, are those which have already been collected by someone else and which have already been passed through the statistical process. The nature of the research is mostly based on the secondary data that have been taken from authentic sources.

OBJECTIVES

The main objective of the study is to evaluate and analyze the effects of the multi-agent system in the production of high quality products.

The specific objectives of the thesis are as:

- 1) Is it true that multi-agents have positively contributed to the quality of production?
- 2) Is it right that multi-agents have increased the quantum of production?
- 3) It is possible to get an accurate approach of determining the quality enhancement.

In this thesis an attempt will be made for the better understanding of the effects made on the production through multi-agents system on the quality of the products

HYPOTHESIS:

H₀. Multi-agents have not positively contributed to the quality of production

H₁. Multi-agents have positively contributed to the quality of production.

H₀. Multi-agents have not increased the quantum of production

H₂. Multi-agents have increased the quantum of production.

Normality of Residual Test (Jarque Bera check)As we recognize that this check is been utilized by maximum of the research students a good way to decide whether or not the disturbance time period or mistakes time period is generally allotted or not .As in the this the null speculation is the mistake time period is generally allotted even as on the identical time the alternate speculation might be Null speculation isn't generally allotted. The rule to reject or take delivery of the speculation is depend upon the P-price and the JB information price if the JB statistic price is much less than the vital price then the null speculation is rejected in any other case accepted.

Regression:

Regression is a idea that changed into first delivered within side the early 18th century, however regression as we are aware of it these days changed into advanced via way of means of Karl Pearson .Regression is used wherein non-stop values are being predicted. Stock fee prediction is normally a regression problem. In this application, we've non-stop information that modifications each minute of each day so long as the marketplace is open. Regression evaluation is broadly speaking used for estimating a courting among or greater variables. Hence it's miles utilized in predictions or forecasting primarily based totally applications. Regression evaluation cannot most effective suggest a big courting among established or impartial variables, however it can additionally suggest a energy of the connection among more than one impartial variables on a single established variable. This is a totally crucial a part of the regression evaluation this is utilized in this thesis. Market information, information articles, correlated stocks, and its inventory information are used as input. They are all impartial variables or as a minimum as impartial as capabilities may be in stocks. This thesis tries to show that everyone those different factors can offer a greater correct prediction of stocks and via way of means of the use of regression evaluation over these kind of reputedly impartial variables, it's miles feasible to get a totally correct inventory fee prediction. Regression evaluation may be similarly divided into numerous sorts. Some of the greater common kinds of regression are linear regression, logistic regression, polynomial regression, and stepwise regression.

RESULTS

This is the chapter that deals with results of the thesis after applying certain statistical tools in order to testify the final results. It is used to testify the hypothesis whether to accept it or reject it based on certain grounds. It will help us to ascertain how good or bad has been the multi-agent technology on the selected manufacturing MFCG sector.

ADF TEST RESULT (AT 1st DIFFERENCE) INTERCEPT BUT NO TREND

COMAPNY	TEST	STASTISTICS	CRITICAL VALUE
HUL	-11.23	-3.34	0.0000
ITC Limited	-12.22	-3.34	0.0000
Nestle India	-10.40	-3.34	0.0000
Dabur India Limited	-10.12	-3.34	0.0000
Godrej Limited	-12.10	-3.34	0.0000

From the above mentioned table it's far pretty clear that (At stage) variables like HUL, ITC, Nestle, Dabur and Godrej Limited aren't desk bound due to vital cost is much less as examine to Test Statistics at 1% stage of importance in the intercept however no trend . From the second one desk at 1st distinction the ADF unit root take a look at indicates that everyone the variables are desk bound because of now the vital cost is extra as examine to calculated cost (T statistics). The unit root take a look at in addition extra said that strong variance is to be regarded in case of disturbance term (blunders term)

FINDINGS AND CONCLUSION

It was found after the data collection and analysis With The increase in the Competition in the market and advancement in the technology, the countries are prioritizing for intelligent and advanced technology in terms of manufacturing in order to improve product design and reducing the waster and improve the quality at the same time that results in economic growth and development. In this paper a similar attempt has been made to understand the impact of multi- agent technology by using the secondary data from various corporate. These structures additionally have a tendency to be hastily self-getting better and failure proof, typically because of the heavy redundancy of additives and the self-controlled features. Multi-agent structures are implemented with inside the real global to many fields which include laptop games, facts structures and so forth due to the cap potential to acquire computerized and dynamic load balancing, excessive scalability, and self-recuperation structures.

- 1) It is true that multi agents have positively contributed in most of the manufacturing companies except few who have not properly used or operated it.
- 2) It is also to be concluded that multi agents have increased the quantum of production in almost all the companies especially the FMCG companies.
- 3) It was also observed that in most of the cases by multi agent system tremendously contributed in the field of reducing the overall wastage of the companies which has resulted in increasing the profitability of these companies.
- 4) It can be concluded that Multi Agent System has positively contributed in almost all the companies but a lot more is to be required and needed for further betterment in this field.

- 5) Multi-agent structures are implemented with inside the real global to many fields which include laptop games, facts structures and so forth due to the cap potential to acquire computerized and dynamic load balancing, excessive scalability, and self-recuperation structures.
- 6) In this study secondary was evaluated through various mathematical and statistical tools like Unit root, regression. It was observed from the study that in most of the cases multi Agent technology has improved the quality and tremendously contributed in reducing the waste at the same time. It was also observed that only those corporate have benefited from that had used it in true sense of technology. Some other corporate have failed to achieve what they had expected by adopting multi-agent technology for some reasons.

It is to concluded that in all the cases Null hypotheses will be rejected at the same time alternative hypothesis are to be accepted

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