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Production In Marketing Distribution Planning Manfacturing Management System

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ABSTRACT: Production in marketing distribution planning manufacturing management system With an aim to resolve the problem of the increasing costs of supply chain in Manufacture Company, an integrated supply chain management model, driven by market demand, is brought forward in this paper, based on the analysis of existing integrated models of supply chain. The management model integrates purchase, production and sale plans with logistics plans. In order to build an integrated supply chain system which contains the inside management system and the outside supply chain system of manufacturing firm and a conceptual framework In this paper we applied ant colony optimization analysis in the pre-processing of data used in the fault diagnostics of industrial robots of integrated supply chain planning is also designed. This paper uses a three-stage integrated supply chain planning model to make supply chain plans, and a classification evaluation model is also suggested to analyze the feasibility of planning by comparing the planned cost with the anticipated cost. Research results indicate that this three-stage integrated supply chain planning model can optimize and reduce the costs of supply chain for manufacturing firms very well.

Keywords*:* Integrated supply chain system, inside FTA-ANT. management system, outside supply, manufacturing, conceptual framework , integrated, supply chain planning,

I. INTRODUCTION

A supply chain is a network of facilities and distribution options that performs the functions of procurement of materials, transformation of these materials into intermediate and finished products, and the distribution of these finished products to customers [1]. Supply chains exist in both service and manufacturing organizations, although the complexity of the chain may vary greatly from industry to industry and firm to firm. Below is an example of a very simple supply chain for a single product, where raw material is procured from vendors, transformed into finished goods in a single step, and then transported to distribution centers, and ultimately, customers. Realistic supply chains have multiple end products with shared components, facilities and capacities. The flow of materials is not always along an arbores cent network, various modes of transportation may be considered, and the bill of materials for the end items may be both deep and large. Traditionally, marketing, distribution, planning, manufacturing, and the purchasing organizations along the supply chain operated independently. Here show the complete block diagram of supply chain management.

These organizations have their own objectives and these are often conflicting [3]. Marketing's objective of high customer service and maximum sales dollars conflict with manufacturing and distribution goals. Many manufacturing operations are designed to maximize throughput and lower costs with little consideration for the impact on inventory levels and distribution capabilities. Purchasing contracts are often negotiated with very little information beyond historical buying patterns. The result of these factors is that there is not a single, integrated plan for the organization there were as many plans as businesses. Clearly, there is a need for a mechanism through which these different functions can be integrated together. Here shows that relationship between supplier network and distributor network.

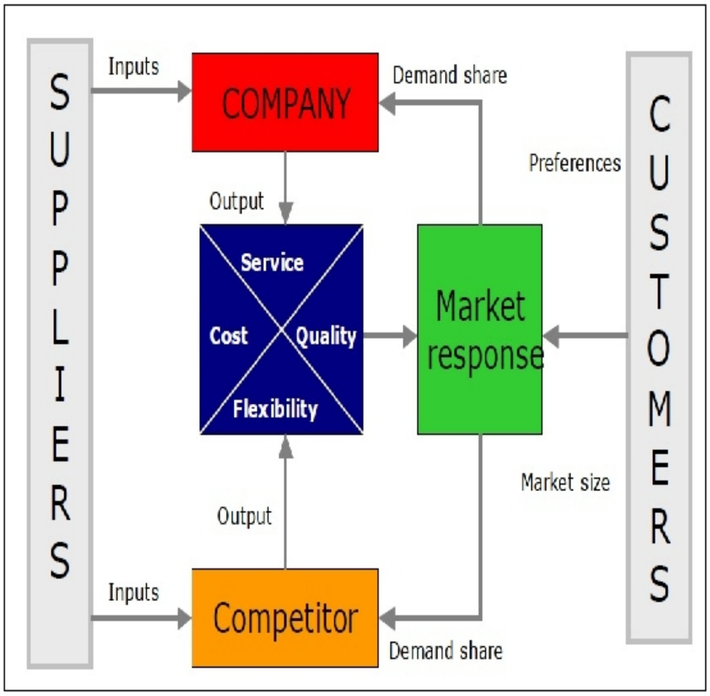

Fig. 1. Relation of supplier and customer.

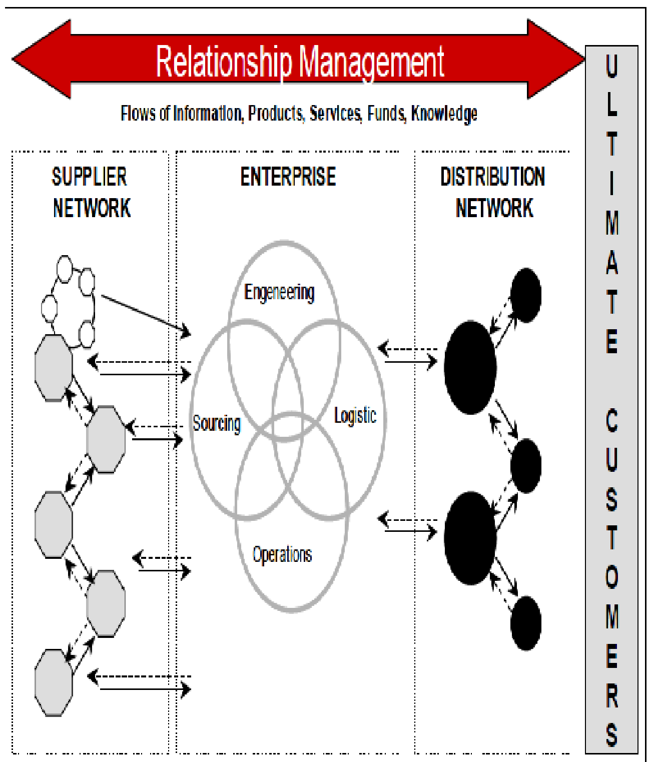

Fig. 2. Relationship between supplier network and distribution network.

Supply chain management is a strategy through which such integration can be achieved. [5] Supply chain management is typically viewed to lie between fully vertically integrated firms, where the entire material flow is owned by a single firm and those where each channel member operates independently. Therefore coordination between the various players in the chain is key in its effective management. Cooper and Ell ram [1993] compare supply chain management to a well-balanced and well-practiced relay team. Such a team is more competitive when each player knows how to be positioned for the hand-off. The relationships are the strongest between players who directly pass the baton, but the entire team needs to make a coordinated effort to win the race. Supply chain management (SCM) [4] is the oversight of materials, information, and finances as they move in a process from supplier to manufacturer to wholesaler to retailer to consumer. Supply chain management involves coordinating and integrating these flows both within and among companies.

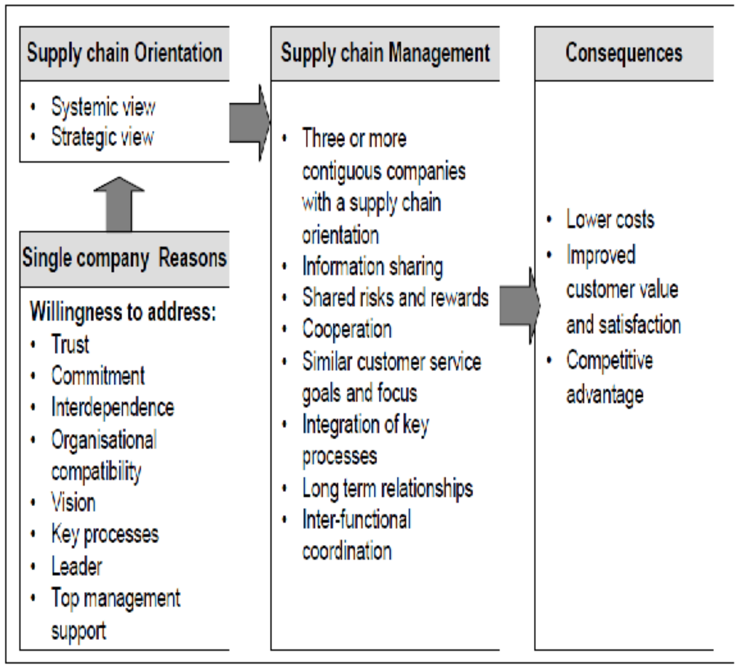

Fig. 3. Information about consequence of management of distribution.

It is said that the ultimate goal of any effective supply chain management system is to[6] reduce inventory (with the assumption that products are available when needed). As a solution for successful supply chain management, sophisticated software systems with Web interfaces are competing with Web-based application service providers who promise to provide part or all of the SCM service for companies who rent their service. Supply chain management flows can be divided into three main flows: (i) The product flow, (ii) The information flow, (iii) The finances flow

The product flow includes the movement of goods from a supplier to a customer, as well as any customer returns or service needs. The information flow involves transmitting orders and updating the status of delivery. The financial flow consists of credit terms, payment schedules, and consignment and title ownership arrangements.

There are two main types of SCM software: [7] planning applications and execution applications. Planning applications use advanced algorithms to determine the best way to fill an order. Execution applications track the physical status of goods, the management of materials, and financial information involving all parties. Some SCM applications are based on open data models that support the sharing of data both inside and outside the enterprise (this is called the extended enterprise, and includes key suppliers, manufacturers, and end customers of a specific company). This shared data may reside in diverse database systems, or data warehouses, at several different sites and companies.

By sharing this data "upstream" (with a company's suppliers) and "downstream" (with a company's clients), SCM applications have the potential to improve the time-to-market of products, reduce costs, and allow all parties in the supply chain to better manage current resources and plan for future needs. Increasing numbers of companies are turning to Web sites and Web-based applications as part of the SCM solution. A number of major Web sites offer e-procurement marketplaces where manufacturers can trade and even make auction bids with suppliers.

II. FAULT TREE ANALYSIS

Fault tree is widely used in the reliability and safety assessment of engineering systems for over 40 years. The fault tree forms a basis for the analysis of a system primary design, and assuring system non-functional requirements (such as reliability, availability and safety). A fault tree is a graphical [8] representation of the relations between basic failures and a specific undesired system failure (Top event). The main result of a fault tree analysis is the probability of occurrence of the Top event. The procedure consists of two steps; construction of the fault tree, and analysis of the tree. In the first step the tree is constructed from a model of real system, automatically, or manually. In the next step, the constructed fault tree is analyzed, qualitatively or quantitatively. A number of reliability analysis tools have been developed to solve different reliability models, but the construction of the reliability models mostly relies on a manual procedure. The manual development could be difficult and error-prone, especially in the case of fault-tolerant [9] systems due to their inherent complexities such as redundancy, dependency and various interactions between components. One solution to this problem is to automatically generate reliability models Fault tree analysis (FTA) is a traditional reliability analysis technique. It is basically a deductive procedure for determining the various combinations of basic component failures that could result in the occurrence of a specific undesired top event at the system level. Standard static Boolean logic constructs, such as AND, OR, and Voting (k-out-of-n, k/n) gates, [10] are used to decompose the fault events and construct the static fault trees. In addition, to model how sequences of fault events cause system failures, several dynamic constructs, such as Priority AND (PAND) and Functional Dependency (FDEP) gates are also proposed. One benefit of the dynamic fault trees (DFTs) is that they can represent the dynamic behaviors of system failure mechanisms in a more compact way compared with traditional Markov models. The DFTs are not only used in research-oriented projects, but also recently introduced in some commercial FTA tools such as Relax Fault Tree. Unfortunately, the formal semantics of DFTs has not been well defined, and there are some fundamental semantic paradoxes in the informal descriptions of some dynamic gates such as the FDEP gates. These semantic troubles have not been [11] addressed before and may result in incorrect system unreliability's. Moreover, one constraint of the DFTs is that the history of event occurrences must be maintained during system maintenance stage, since the specifications of dynamic gates such as PAND depend on the past order of event occurrences. Consequently, the maintenance of the DFTs could be a critical issue since it now relies on a per mutational rather than a combinatorial model, and the history of component failures (and recoveries) must be used to update the fault tree states. FMEA is a technique that identifies, first, the potential failure modes of a product during its life cycle; second, the effects of these failures; and, third, the criticality of these failure effects in product functionality. FMEA provides basic information to reliability prediction, and product and process design. FMEA helps engineers find potential problems in the product earlier and thus avoids costly changes or reworks at later stages, such as at the manufacturing stage and at the product warranty stage. In the FMEA process, product functions must be carefully evaluated, and the potential failures must be listed. This analysis process provides a thorough analysis at each detailed functional design element. It allows FMEA to be a very useful tool in quality planning and reliability prediction. Most of the automotive part designs are required to be evaluated by the use of[12] FMEA in the design process. A FMEA report accompanied with the component/part design is a common practice in automotive industry. A good use of the FMEA technique can provide a manufacturing company benefits such as high product reliability, less design modification, better quality planning, continuous improvement in product and process design, and lower manufacturing cost. A company must fully utilize FMEA to improve the reliability of the products and the processes to obtain the benefits mentioned above. If a company's main purpose of developing the FMEA report is to fulfil Customers' demand, then the benefits of performing FMEA will be reduced, and the cost for the[13] FMEA process may not be compensated by the benefits of performing the analysis except that it satisfies customers' demand to have the report.

The main reason that people do not fully utilize the FMEA result is that they do not know how and when to link the FMEA information with process control functions. Is there a linkage between the FMEA report and process control? This paper intends to reveal this hidden linkage. This research has developed An approach to integrate FMEA, product design, and process control to one complete closed loop to establish an overall quality control plan.

III. IMPROVEMENT OF FAULT TREE ANALYSIS FOR AUTOMATIC MANUFACTURING ROBOT

the process of fault tree analysis in automatic manufacturing industries. The automatic production system fulfills the high rate of customer demand and supply. The working of high speed robot occurred some fault and error problem in production process. These fault and error process effect the rate of production and deceases the reliability factor of industries. For the improvement of reliability and diagnoses of fault various model and methods are used [2] such as fault analysis tree, fault analysis and management and Markova model process of production. Failure of the robot results in production line down-time and, in some cases, damage to the product that is being processed. Typically, it takes several days to bring the production line back to operation because the entire tool and workstation needs to be cleaned once the robot has been repaired or replaced. If product damage occurs, it may represent a loss in the order of several tens of thousands dollars, depending on how far in the production cycle the damage takes place. The risk of unexpected failures can be significantly reduced by monitoring the performance of the robotic system and predicting failures. This information can be used to prevent failures by servicing the robot as a part of the regular maintenance schedule of the tool. Those techniques are called health maintenance or condition (based) maintenance of the industrial robot. During the last decades, a large number of approaches have been developed towards machine condition monitoring, aiming to fault detection [1]. The common aspect of all is the intention to detect changes in characteristic aspects of the "normal" or "nominal" machine behaviour that would possibly imply a fault, wear or abnormal operating condition. Dynamic response of machines, a number of signal processing methods have been especially adapted and modified, in order to expose characteristic aspects of the [2] "signature" of the machine related to specific faults. In the next section we discuss the fault analysis of robot based on FTA and next section discuss fault analysis by neural network and finally discuss path selection process for fault analysis.

A. Robot fault analysis

For correct modeling of performance for robot, the tool FBD has been used in primitive haze to show the system inputs, treated process and outputs of system clearly and briefly. In the neat phase, the fault tree analysis (FTA) has been engaged, that we by FTA as a logical model of up to down, to detect the error routes from an undesirable position. These detected routes are starting of a top event. The top event has been obtained by analyzing treated processes and in the primitive step. After detecting the error routes, the top event is as a potential fault and its reasons are recognized and then are investigated to analyses destructions (faults) in the tables FMEA. Finally, the preventive acts are suggested to control occurrence of destructions. Thus, reducing the fault in the result of preventive acts, the reliability R (t) will be improved. Determining the potential modes of destruction is required to know and analyse the system perfectly. Here, there is the system of cannibalization having four free- degree that has been designed in order to move spares in the weight of maximum 500 gr [3]. In this robot have been used strong steel arms and seven serves of dc motor with the moment about 30 kg and many other electronic hardware's [4]. The plan FBD for the robot is according to fig. With a complete plan FBD, the potential fault modes are determined by studying treated processes. We find that disablement in the whole process, not moving the joints or clamps, not sending message from sensor or not sending the orders from CPU, can be undesirable modes in present processes that may influence the output of process. By knowing such modes, we start to study the reasons.

IV. IMPLEMENTATION DETAILS & RESULT ANALYSIS

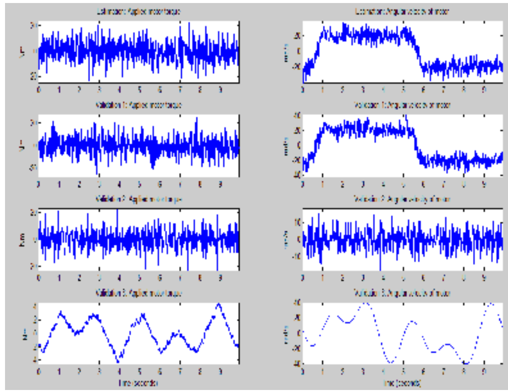

Fig. 4. Component analysis of automatic indstrial robot for angular velocity and time respone for processing of fault tree data.

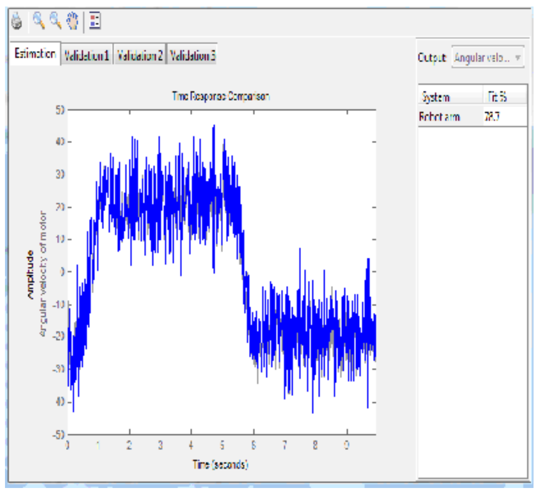

Fig. 5. Data amplitude and time respone of robot arm for validation of fault occured in the process of automatic manufacturing.

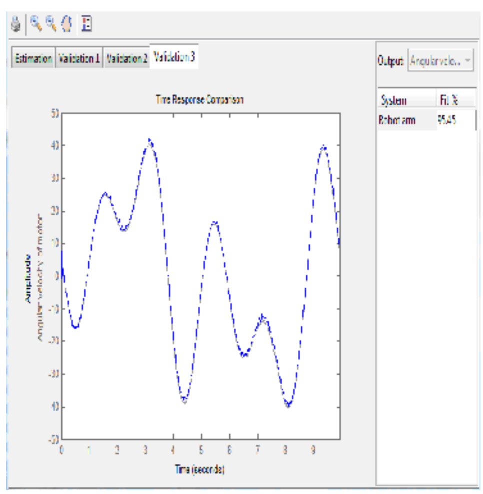

Fig. 6. Data amplitude and time respone of robot arm for validation of fault occured in the process of automatic manufacturing and the change the value of fault path with certain amount of constant.

A. Fault path selection based on ant colony optimization

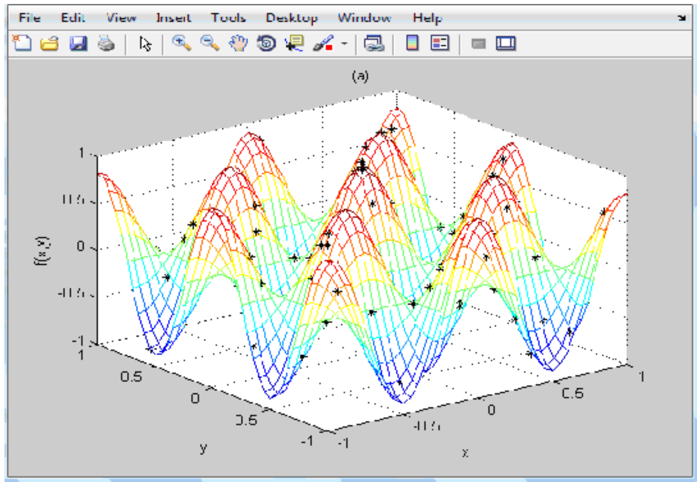

Fig. 7. Path selection for robot arm in fault tree in robot moved with angular velocity.

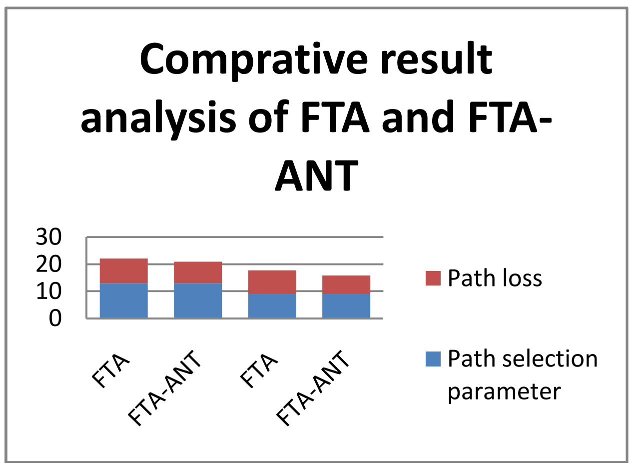

Fig. 8. Comparative result analysis for fault analysis using FTA and FTA-ANT. The loss of fault path decrease in ant process in compression of FTA.

V. CONCLUSIONS

In this paper we applied ant colony optimization analysis in the pre-processing of data used in the fault diagnostics of industrial robots. The output of FTA was then used as the input of a Ant Colony System classifier whose output predicts the state of the industrial robot. As states we considered the normal operation and 5 faulty conditions which are: brake drag (high &medium), collision (hard & soft) with external obstruction and incorrect motor commutation (phase angle). Verification of the proposed algorithm was performed off-line using experimental data obtained from an industrial robot used in the semiconductor manufacturing industry. The FTA was excellent for data reduction and capturing the required features of the signal needed for the Ant Colony System training. The experimental results showed that the Ant Colony System classifier had a very high fault detection success rate (around or above 90%) for all faults. However, it showed difficulty distinguishing between the hard and soft collisions. Combining these two relevant faulty conditions into one fault that of just "collision" the Ant Colony System based classifier achieves a high rate of success For that fault too.

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