Automation in Textile knitting Process: An ERP Initiative

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ABSTRACT

The production of top quality materials / products at high speed with less time is only possible through and efficient information systems. Technologies that carries the flow of work has been widely applied in the various industries, such as OA (Office Automation), manufacturing, banking, security, education and research institutions, financial services, telecommucation industy and so on. The basic objective to adopt such technologies is to improve the business processes through automation using information system. In this research work the authors would like to presents the flow of information in an automated manner for knitting of yarn in textile industry, where it is implemented in Masood textile. This automation in information system developed efficiently in-house ERP (Enterprise Information System).; it not only helps nut also support the management to manage the business processes

KEYWORDS

	Automation		**Business processes integration**
	Enterprise information system		**Knitting**
	Automated information management system		**Information system**

PREAMBLE

Why is Automation very important? During development and manufacturing quick information turn around, that is required to hit the target and also to sustain the speed of process. Process automation has become very much common in industry [1, 2]. Every company that is involved especially the production oriented business use the automation information system for better management and to track the business processes / operational activities [10]. Nowadays automated information system based applications are very much capable in collecting and measuring the required details for manufacturing or manufacturing related processes because process could be complex and the information required is huge [11].

The systems are based on automation is very simple thought which the information is forward to accomplish the business functions. These systems work on pre-defined procedure and required less humans interaction and maintenance as compare to traditional information system. These AI based applications fetch the information and send it for further operations. The automated system works for government, private and especially in business context e.g. customer satisfaction, sales department and operational tracking. [13, 14]

Automation in business functions provides enterprise integration by passing the information amongst the systems and processes [3]. The integration in business functions enables the systems for both data and flow of work; because to integrate the flow of work operational and functions integration is required. The reason is that information is swap between the applications, systems at different locations in ERP.

The production of top quality materials / products at high speed with less time is only possible through information systems. The ERP system in MTM (Masood Textile Mills) is consists of different applications as per their requirement for manufacturing, tracking and also to manage the resources. Each application has a distinct task and can be adapted separately to specific processes and requirements. An overlook of the system architecture for knitting is shown in figure 2. The objective of this research work is to define the processes for knitting and role of information system to make them fast, automated and efficient for tracking and monitoring during production.

AUTOMATION

Computer and related technologies are very much efficient and capable of carry out the functions that acquire humans efforts. While the execution of such function through machine or automation is just because, the humans do not wish to perfrom the same function again and again and also can not perform them consistently, accurately and reliably. Mass production is the major cause for the development of such automated system because the humans can not perform the jobs fastly as machine or automated system can [4, 5].

The automation also offer the economicle benefits at enterprise level is the major cause of attentions towards, the capabilities of automation system [6, 7, 8]. Atutomation is simply defined as atomatic control of manufacturing throught number of successive stages or the use of automative control to replace or reduce the humans efforts[4].

Process automation is described using the dedicated molding and appropriate drawing tools for work flow. While in transformation, set of rules are defined for the movement of information in the system. Where the data is read and receive from the sources agent and proceed for further operation in an understand format and this level of movement is responsible between the different connected components. The benefits of Business process automation include the work flow, data integration, and reduction of hand written form, human errors and better process flow and also to allow the new services to the customers for real time monitoring in business processes. [9]

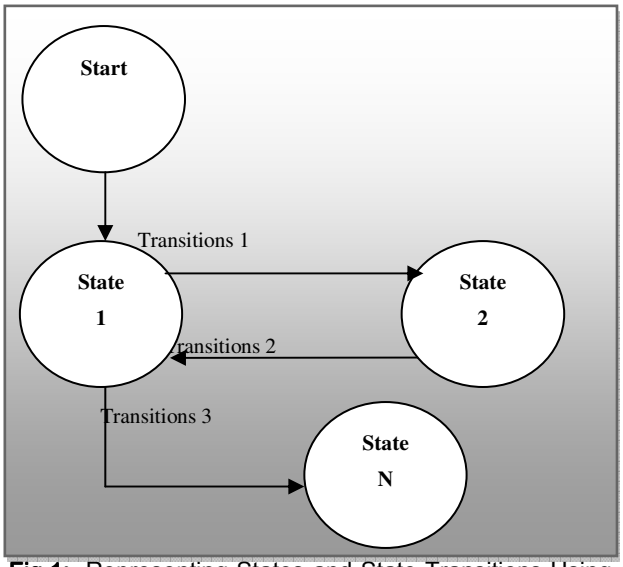

Fig.1: Representing States and State Transitions Using a State Diagram in an automated system

AUTOMATED INFORMATION IMPLICATION IN TEXTILE INDUSTRY

Information management systems are broad level systems, these systems incorporates huge amounts of data across an organization. Data is entered into systems thought-out the organization. Where it is the responsibility of data management system is to pull these data elements into unified systems. Organizations collect the massive data depends on the nature and size of the organization, and system consist on different software applications with single platform. In order to access and to utilize the information, they need a well-planned and mature information management system.

The given model for automation in information system shown in **Figure2** is practically implemented in Masood textile mills. It shows the flow of working and information during knitting process to fabric. As knitting process consists of different processes, different departments play their contribution during manufacturing process. The automated information system divides these processes in different states. Each state has number of transaction. That starts from purchase order originate by the customers and the role of each department till the job completion or final state. Each state is directly or indirectly communicates with the other to describe the flow of process along with information.

MTM (Masood textile mills) have their complete and fully developed ERP system. It almost contain all important applications that provide the vie solutions for textile operation and management. Where the knitting processes is totally based on automation. The AIS (Automated information system) includes different agent's works together in knitting e.g., customer, PPC (production and planning department), Head office, vendors, store, knitting department, third parties manufacturing units.

In (state1) customer originate the PO (purchase order) and system forward it to PPC department (production & planning control department) to check the availability of vacant slot for execution or availability of resources, if not then PO return back to customer with PO status either successful or not.

If resources are available the PO (purchase order) forward towards head office for YD (Yarn Demand). Head office in (state2) generates the inquiries to yarn vendors for YO (Yarn order) and also give the feedback or status of Yarn to the PPC department. Yarn store (state3) receives the yarn as per requirement from vendor or Yarn supplier.

If yarn (State4) does not meet the requirement the store department rejects the order and update the status back to head office. Accepted yarn issues to the knitting department knitting for fabrication. In case (state5) if knitting department reject transaction due to excessive load. The store issues the yarn to third knitting parties or for fabrication.

After the (State6) completion of order job or fabrication the knitting department or third party knitting vendor / manufacturer issue the knitted fabric to the Grey Fabric store for delivery.

In case of any discrepancy related to job order or problem in production the system back to the knitting department or to the third party. Finally the product delivers to the customer and closed the job successfully.

During the manufacturing and execution, an intelligent system clearly defines the steps for production and also provides the support in an efficient manner which is not possible traditionally. In order to access and to utilize the information, they

need a well-planned and mature information management system. The role of information system toward automation and order tracking and monitoring support the organizations for batter management and also to serve their customer efficiently.

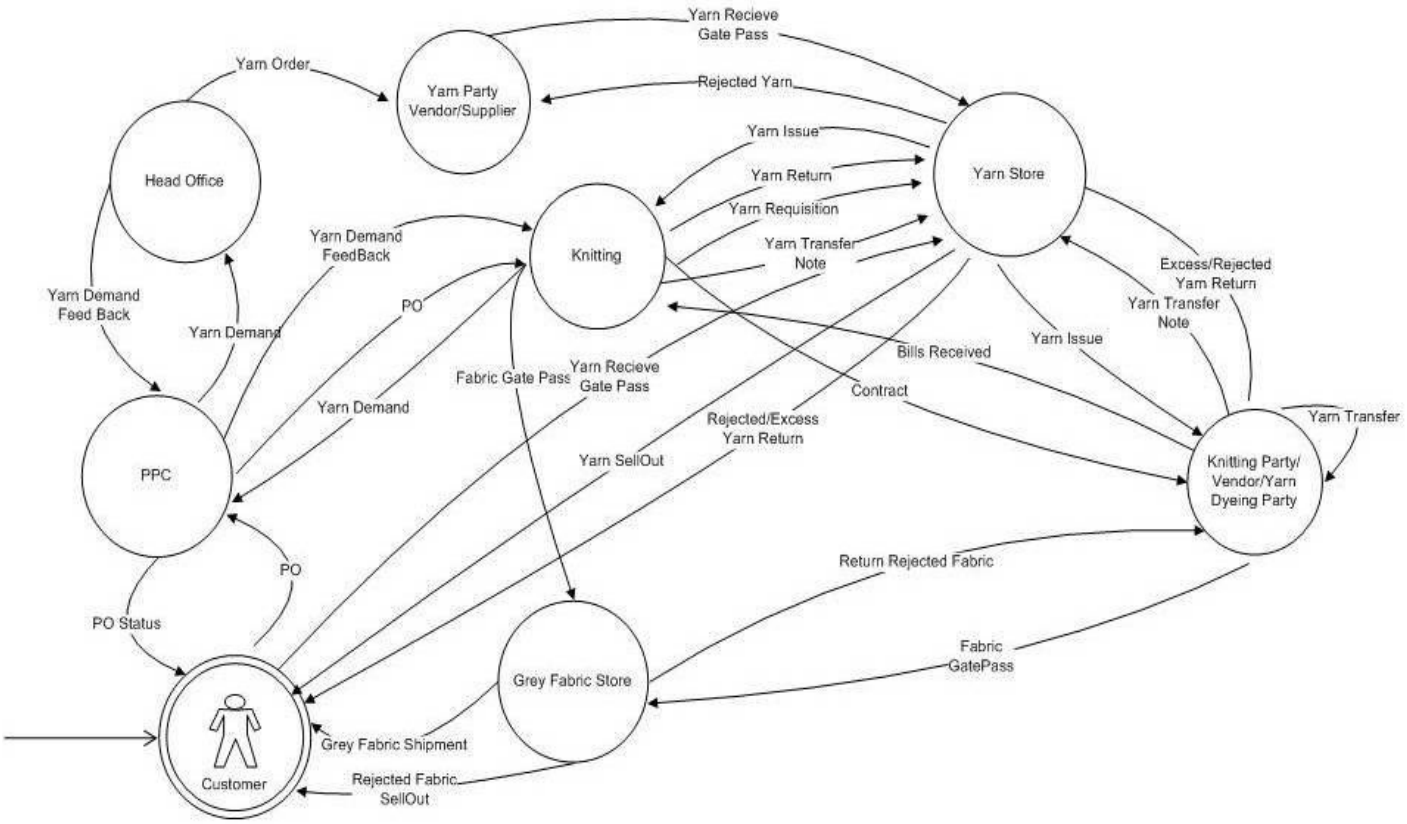

Fig.2: Automation in knitting & flow of information

CONCLUSION

During manufacturing and execution for manufacturing, intelligent system clearly defines the steps for production, planning and also provides the support in efficient manners, which is not possible traditionally. In order to access and to utilize the information, they need a well-planned and mature information system. Where it serve for automation and monitoring and tracking that support the organizations towards the better management and also to serve their customer efficiently and timely?

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