

ABSTRACT

AN ARCHITECTURE FOR A DECISION SUPPORT SYSTEM FOR MANUFACTURING PROCESS

by

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Variation reduction activities in auto body manufacturing have indicated that many of the root causes relates to a lack of organizational learning and interaction between suppliers and the design personal. Various researches have shown that 'experience' need to be quantified and reduce to design rules and made available at the point of use. Another problem that is seen through out the design and development process is the mismatch of concepts that occur within the organization. This leads to the poor quality products, increase in lead-time, higher product development time, increase time to market and cost. One can relate this to improper/inadequate concurrency, poor communication links, and lack of understanding of the design process. A stronger interaction and a formal communication between activities are needed that can achieve a design so that these problems can be preclude from happening in the plant environment. The current emphasis on ISO9000 provides an excellent opportunity to improve the process and use it as a framework to capture and communicate knowledge. This research focus on optimum way to represent process, work out a framework to capture it, then to redesign and continuously improve the process by linking it with the voices of customers. Once the process is captured, research identifies models that will link activities to the problem solving methodology that best suit that activity. Knowledge capture and representation models are generated for organization learning. Knowledge utilization model helps to extract organization knowledge with respect to project and activities and finally a Decision Support System architecture is presented that will tie all these models so that decision can be made effectively and process can be monitored and improved.

This decision support system architecture will help product and process designer, builder and production personal to make intelligent decision and solve problem effectively. This is achieved by elimination the miscommunication through the integration of effective feedback integration between activities and by increasing sharing of information and knowledge through knowledge capture and utilization.