

Supply Chain Management And Design Chain Management



Submitted By:

Mitanshu Garg

B.Tech, III year

Production & Industrial Engineering

Department of Mechanical & Industrial Engineering

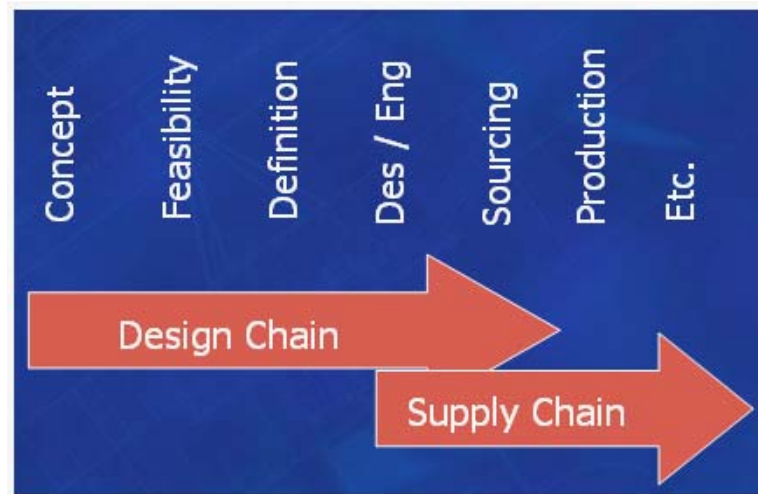
Indian Institute of Technology Roorkee

Uttarakhand - 247667, India

Email: mitanshu.garg@gmail.com

Supply Chain Management is the management of the entire value-added chain, from the supplier to manufacturer right through to the retailer and the final customer. SCM has three primary goals: Reduce inventory, increase the transaction speed by exchanging data in real-time, and increase sales by implementing customer requirements more efficiently. Supply chain management (SCM) deals with the planning and execution issues involved in managing a supply chain. SCM refers to the analysis of and effort to advance a company's processes for product and service design, purchasing, invoicing, inventory management, distribution, customer satisfaction and other elements of the supply chain. SCM usually refers to an attempt to redesign supply chain processes in order to achieve streamlining.

Supply chain management, which is primarily focused on ordering and procurement logistics, begins at the front end of the product lifecycle because, in many industries, the same partners that produce parts or components for a product are being delegated responsibility to participate in the design of those parts and components. **Design chain management** or management of the intellectual supply chain is becoming as important, or more important than the logistics and production supply chain. Design chain partners must be able to quickly and effectively share and leverage each others resources, knowledge, products, and where appropriate, intellectual capital.



“Collaborative product development is a capability that truly adds value... Simply squeezing supplier margins is eventually a zero-sum game that does not enhance revenue for either trading partner. Furthermore, up to 80% of product cost is committed by the time the product is designed, prior to procurement, further accentuating the need ... to offer greater design chain management.”

— David Yockelson

A design chain lets a company expand and contract its product development investment at will. It allows companies to maintain world-class core competencies, but rely on a select group of trusted third parties for less critical skills. Companies that optimize their design chains reduce their R&D costs and get more products to market.

Design chain management is not just a concept; it's a management process. The product development process flows through the design chain. One of the biggest challenges of effective design chain management is that a company can't manage multiple variations in its own process. However, a standard product development process will eventually emerge for the design chain, just as it has for supply chain management.

According to Detroit-based CIMdata, the automotive industry has a design (or intellectual property) supply chain. There, says CIMdata's director of research, the automotive industry is making progress in effective integration. But it still has a ways to go. OEMs and Tier 1s are aggressively pursuing what CIMdata calls "collaborative product development"—collaborative

product design and design chain management, which includes such basic issues as working with suppliers, sharing designs and design activities, and realizing that they're not going to do it all themselves. The larger issue in outsourcing design work is in bringing people together more effectively into the overall environment so that all can be managed more effectively.

Such collaboration is not just a technology issue. It's also an operational issue, which involves cultural, organizational, and ownership issues. The technologies provided by the product life cycle management suppliers are the enablers that allow these collaborative environments to happen. For example, how do OEMs and suppliers handle design review-and-approval processes, as well as security and privacy issues? Guaranteed, now that these processes involve different companies, organizational structures, and people, you can't assume the processes are going to work the way they have in the past.

To date, most automotive customer data reside in dealer management systems, which are contracted, bought, and paid for by the dealers themselves. Dealers have been very protective about their customer data, especially since the OEMs a few years ago announced they were going to try to disintermediate the dealer chain.

The solution here is basically to re-engineer the entire OEM-to-dealer systems architecture. The goal is to enable better sharing and to figure out how to create processes and data that will let [both OEMs and dealers] mine and use the data to gain competitive position.

Due to reducing product life cycle and increasing product complexity, design chain management has become more important for industries to develop innovative products within a shorter lead-time. Selecting the design chain partners that is a key determinant of co-development success involves multiple selection criteria and constraints that are either qualitative or quantitative. Poor selection of design chain partners may cause higher development time and cost and less competitive products.

Enterprise Web Portal

If you don't have next-generation management processes and advanced information systems for handling organizational and distance barriers, the use of outside development chain partners could delay bringing products to market. Companies definitely need to consider upgrading their internal product development systems. After finishing that task, they should extend the architecture to outside design partners.

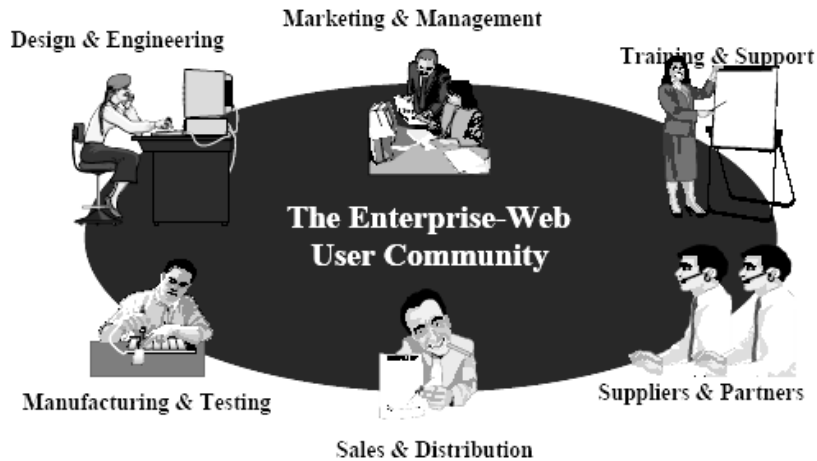
The promise of electronics design chain optimization is alluring, but you can't achieve it without the appropriate application software, hardware and process infrastructure. Some companies are so paralyzed by the infrastructure that they don't even try to manage the design chain. So what happens? They make the mistake of waiting, and bolder competitors gain an advantage. Then there are the companies that initiate design chain programs, but neglect to build the necessary infrastructure. If they're lucky, they will get some limited benefits, but it's unlikely they'll fundamentally transform their business around design chain management to achieve a sustainable advantage. At most, they're likely to revert to e-mailing documents, drawings and data as the basis for their collaboration. What a poor substitute for a design chain management solution!

As we enter the new millennium, the approach to product development is evolving rapidly. Companies are in the process of creating a distributed design and manufacturing environment that enables integrated product, processes, and protocols development (IP3D). Certain strategies and some specific technologies are required to create such an environment. One such strategy is finding effective methods for communication and sharing of information, especially those related to design and manufacturing, throughout the entire enterprise and the supply chain. The technologies that support such a strategy must be able to deal with distributed environments and databases, must ensure reliability and security, and must be practical.

Electronic access to design and manufacturing information within the extended enterprise must be Web based because of its universal interface, open standards, ease of use, and ubiquity. To effectively deal with the distributed data, we recommend combining the distributed object standards (e.g. CORBA/DCOM) with the Web standards and protocols (e.g. Java, XML, IIOP) to create the Object Web. Finally, we propose that the Object Web must be combined with an enterprise's information authoring and management systems (e.g. CAD, PDM, ERP) to create the Enterprise-Web (E-Web) portal, with the mission of providing the right information to the right person at the right time and in the right format anywhere within the extended enterprise.

To remain competitive, OEMs must operate efficiently at the extended enterprise level. An extended enterprise comprises an OEM, its supply chain, subsidiaries, consultants, and partners affiliated with the life cycle of a particular family of products. By integrating the various components of an extended enterprise into the development process, OEMs can dramatically reduce the cycle time and cost, while improving quality and product variety.

Access to and viewing of information at the enterprise level is now primarily through massive sets of paper drawings. There is practically no sharing of information, updating is at best cumbersome, and searching for specific information or versions nearly impossible because of the massive number of drawings and MCAD/ECAD files. The problem is magnified by the fact that the majority of the actual manufacturing is now performed by outside suppliers, who are likely to be located in different cities, countries, or even continents from the OEM. The impact of this disjointed environment on the overall product development cycle is enormous.



The issue common to both groups of server customers is the enterprise-wide management of data and resources. This management must be in place to ensure integrity of data and propagation of up-to-date information throughout the organization. Thus, integration with PDM/ERP products is critical to the success of a Web-based system. ECAD/ MCAD packages play the role of the authoring tool for creation of information in our proposed “dynamic” system. The system must be dynamic because if we simply take a snapshot of the database (i.e. data in libraries) and convert it to a Web-compatible “visual” document, the result is a “static” server which has lost contact with the source (which contains changes to the information since the last snapshot) and have generated a heavy-weight file which cannot easily be transmitted or searched. Moreover, any mark-up that must be transmitted back to the source and managed there will have a much tougher path. The source of information in our case is primarily CAD data in libraries; however, a PDM system can serve up other types of information generated elsewhere in the extended enterprise (e.g. front/back office documents).

The importance of the Web in providing access to information goes far beyond pure viewing. Browsers provide a powerful publishing capability with their visual editors, drag/drop capabilities, simple one-button publishing, page wizards, and support of HTML/XML/Java tools.



References:

- ❖ Wikipedia: http://en.wikipedia.org/wiki/Supply_chain_management
- ❖ Product Lifecycle Management – “Empowering the future of Business” – A CIMdata Report
- ❖ The Enterprise-Web portal for life-cycle support By M. Rezayat
- ❖ Presentation by David W. Paulson. Mechanical Advantage, Inc.