The Importance of Communication Infrastructure in Concurrent Engineering

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Abstract

Concurrent engineering is an imperative concept in the world of product development. With the globalisation of industry, the market has been demanding higher quality products at lower costs, delivered at faster pace. With most companies today accepting the concurrent engineering approach as a formula for product development success, this approach is becoming ever more popular and dominating over the slower sequential product development method. Fast changes in technology, forced design cycle time reduction, emergence of new information technology and methodologies, as well as other aspects such as organisational and behavioural basis caused the sequential design process to progress into a concurrent engineering approach.

The basic concept behind the concurrent engineering approach is that all parts of the design, manufacture, production, management, finance, and marketing of the product are usually involved in the early stages of a product's design cycle, enabling faster product development through extensive use of simulation. Its key approach is to get the right data for the right person at the right time.

There are forces that govern changes in the product development, and these forces must be steered towards prompt response to competition and higher productivity in order for companies to exist and successfully expand in the global market place.

Concurrent engineering is made up of four key dimensions, one of them the communication infrastructure dimension, which is the focus of this study. This study defines the information infrastructure dimension, and some of the tools and technologies that support communication and collaboration. It then discusses how to employ

the concurrent engineering approach from a communication infrastructure dimension point of view, starting with assessing the current product development process and eventually envisioning the path to take to a successful concurrent engineering environment. Communication infrastructure technologies and tools can be seen as central to a company's implementation of concurrent engineering, as shown in the case studies covered in this work.

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Nomenclature

Acronyms

IDA	Institute for Defence Analyses
IT	Information Technology
PC	Personal Computer
CAD	Computer-Aided Design
CAE	Computer-Aided Engineering
3D	Three Dimensional
DFM	Design for Manufacturing
QFD	Quality Function Deployment
R & D	Research and Development
DARPA	Defence Advanced Research Agency
CE	Concurrent Engineering
CALS	Computer-Aided Acquisition and Logistics Support
NFS	Network File System
LAN	Local Area Network
EDM	Engineering Data Management
PCB	Printed Circuit Board
DEMI	Design Engineering to Manufacture Interface
PPCC	Product Planning Change Control
IADB	Issue and Archive Database
ENDB	Engineering Database
PLT	Product Launch Team
PDT	Product Development Team
PMT	Product Management Team
PTMs	Project Technical Meetings
PCMs	Project Control Meetings