

Decision Production Systems in Product Design and Manufacturing



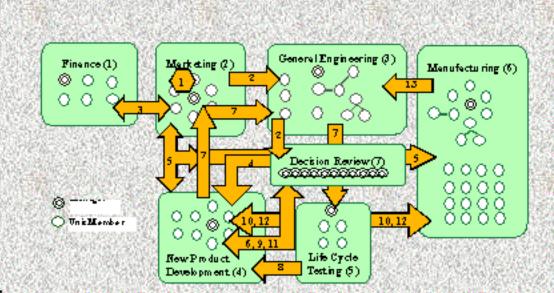


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Decision Production Systems

Product design, manufacturing, and management processes are dynamic networks of individual decision-makers who communicate via many channels to share information and produce judgments.

We call these networks decision production systems.



Information flow in a typical product development process.

Components of a Decision Production System

- Decision-makers
- Decisions
 - choices, objectives, constraints
 - amount and nature of uncertainty
 - information requirements and outputs (both tacit and explicit)
 - solution methodology, duration, frequency
- Information
 - contents, attributes, format, precision
 source, media (paper, spreadsheet, image, ...)
 age, reliability

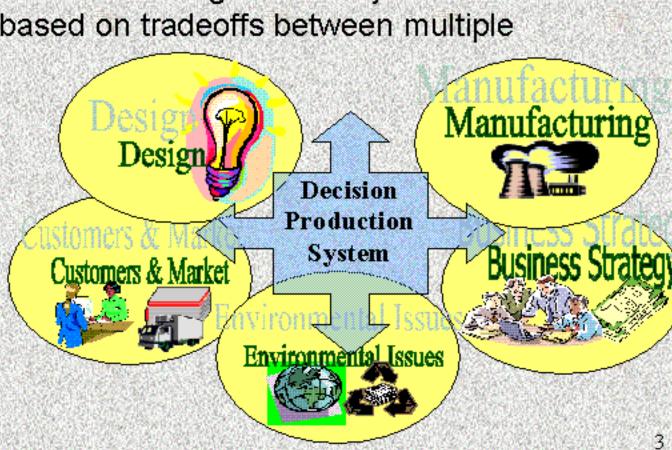
Product Design and Decisions

Product development is an information flow governed by decisionmakers who make decisions based on tradeoffs between multiple

objectives under time and budget constraints.

Design and development occurs in a system just like product

manufacturing does.
Thus, this system is a decision production system.





Current Work

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Collaborator: Merix (Forest Grove, Oregon)

Studying product development organizations and manufacturing firms to learn how they use environmental information, particularly to generate a material disclosure statement (MDS).

Models of information flow (shown at right) demonstrate gaps between existing processes and MDS generation process.

Customer Shipping MDS Flow Shipping MDS Spread Sheet Customer Field App Fineld App Fingineer Quotes OA Production operators Sales COLT Process Group Flow Flow Managers Flow Material Information Flow Material Information Flow Material Information Flow Suppliers Flow Material Information Flow 5 Material Information Flow Shipping MDS Shipping MDS Shipping MDS Shipping Froduction OA Production OA Froduction OB Material Information Flow Suppliers Flow Suppliers Flow Suppliers Flow Suppliers Flow Suppliers Flow Material Information Flow Suppliers Flow Flow Flow Suppliers Flow Flow Flow Flow Suppliers Flow Flo

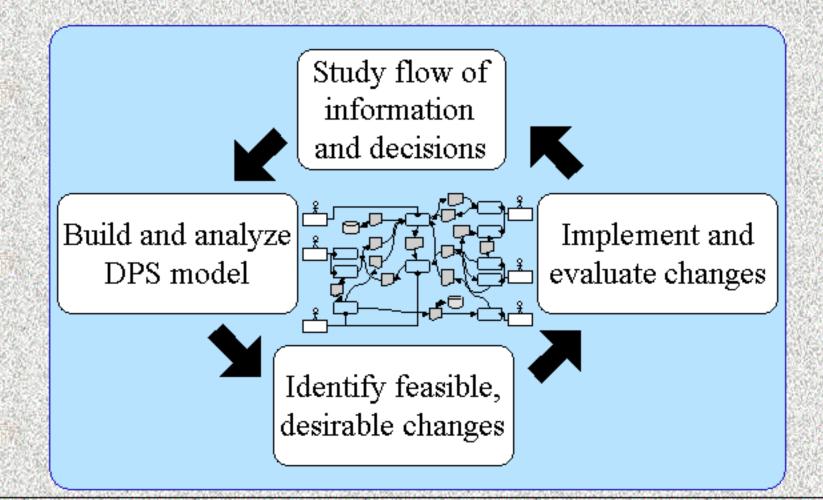
Customer Shipping Board Fabrication and Information Flow Field App. Engineer Quotes O/A Production operators Steve Group For Day From the Industry Groups Tech Asst Managers Field App. From the Industry Groups From the Industry Groups Tooling MSDS Info MsDS In

Other Applications

R&D portfolio management
Product development
Production planning and scheduling
Supply chain management



Improving Design and Manufacturing Organizations



Conclusions

Many activities are complex systems of decision-makers.

Improving the performance of such a system requires understanding the individuals in the system, their objectives, the information flow among them, and the dynamic behavior.

Analyzing models of a decision production system can help participants identify feasible, desirable changes.