Title: Managing the Conversion to Concurrent Engineering

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Abstract: This project examines the concept of concurrent engineering and specifically deal with issues in the implementation and management of a concurrent engineering program. Why must CE be considered by US companies, its definition, conversion to CE environment, barriers to the implementation of CE, communication in teams are discussed. Also, some cases of companies are described briefly.

Managing the Conversion to Concurrent Engineering

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OSU TEAM-1

Managing the Conversion to Concurrent Engineering

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INTRODUCTION - THE NEED FOR CHANGE

Global Economic Competition

4.5 Trillion dollar Budget Debt
- Call for increased U.S. exports

Increased Consumer Quality Demands

Reduced Lead Times for Quicker Market Entry

60% to 80% of Product Cost Committed in Design Stage

Concurrent Engineering: The Concept

Parallel vs. Serial Product Development

Expertise Integration

"Right the First Time"

Concurrent Engineering: The Definition

"Concurrent Engineering is a systematic approach to the integrated, simultaneous design of both products and their related processes, including manufacturing, test and support. It is a concerted corporate effort to achieve maximum efficiency, economy and quality throughout the total business cycle (*Turino*, 1993)."

CE: Parallel Activities

- Design for Performance (DFP)
- Design for Manufacture (DFM)
- Design for Testability (DFT)
- Design for Serviceability (DFS)
- Design for Compliance (DFC)
- Design for Quality (DFQ)

Managing the Conversion to Concurrent Engineering

Phase 1: Short Term Focus

Phase 2: The Product Focus

Phase 3: Product and Service Focus

Phase 4: Process or System Focus

Phase 5: Continuous Improvement Focus

Seven Organizational Barriers

1. Lack of Commitment from Senior Management
2. Inadequate Organizational Climates
3. Insufficient Cooperation Between Staff Functions
4. Meager Reward Systems - dept goals
5. Little Customer Involvement
6. Lack of Supplier Involvement
7. Fear of Creativity Loss

Common CE Failure Modes

Cost/Benefit Ratio

Inactive Program Champion

Poor Organizational Vision

Lack of Experience

Culture Paralysis

Wide Variety of Tools

Fear

Middle Management Hijack

CE Team Work

No demand for Continuous Improvement

Five Critical CE Actions

Making the Cultural Transformation

Effecting Organizational Change

Concurrent Engineering Team Building

Providing Adequate Support Technologies

Fostering Role Definition and Interaction

Multifunctional Teams - Interpersonal Communication

Personal Construct Theory

Entity-Attribute Grids

Consensus

Correspondence

Conflict & Contrast

Concurrent Engineering Methology
For Enhancing Teams
(CEMET)

Phase 1: Problem Identification and Evaluation

Phase 2: Data Collection and Materials

Phase 3: Development of Team Member Viewpoints

Phase 4: Comparison of Team Member Viewpoints

Phase 5: Discussion of Comparison of Viewpoints

ROLE OF THE TEAM LEADER

Representative of Team to Management

Team Selection

Assign Responsibilities

Keep Team Informed on Management Perspectives

Keep Project on Track

Settle Disputes and Conflicts

Case Studies

AT & T - 3B Series Computer

Model Shop Eliminated

Yields up from 50% to 90%

Design Iterations reduced by 33%

Boeing - Ballistic Systems Division

Used Product Development Teams - Multi-disciplinary

Manufacturing Costs down by 46%

Material Shortages down from 12% to 1%

Hewlett-Packard

Implemented a TQC program that included CE

Scrap and Rework Costs cut by 80%

Manufacturing Costs reduced by 42%

CONCLUSIONS

The Change is worth it

If the change is attempted - what are the barriers ?