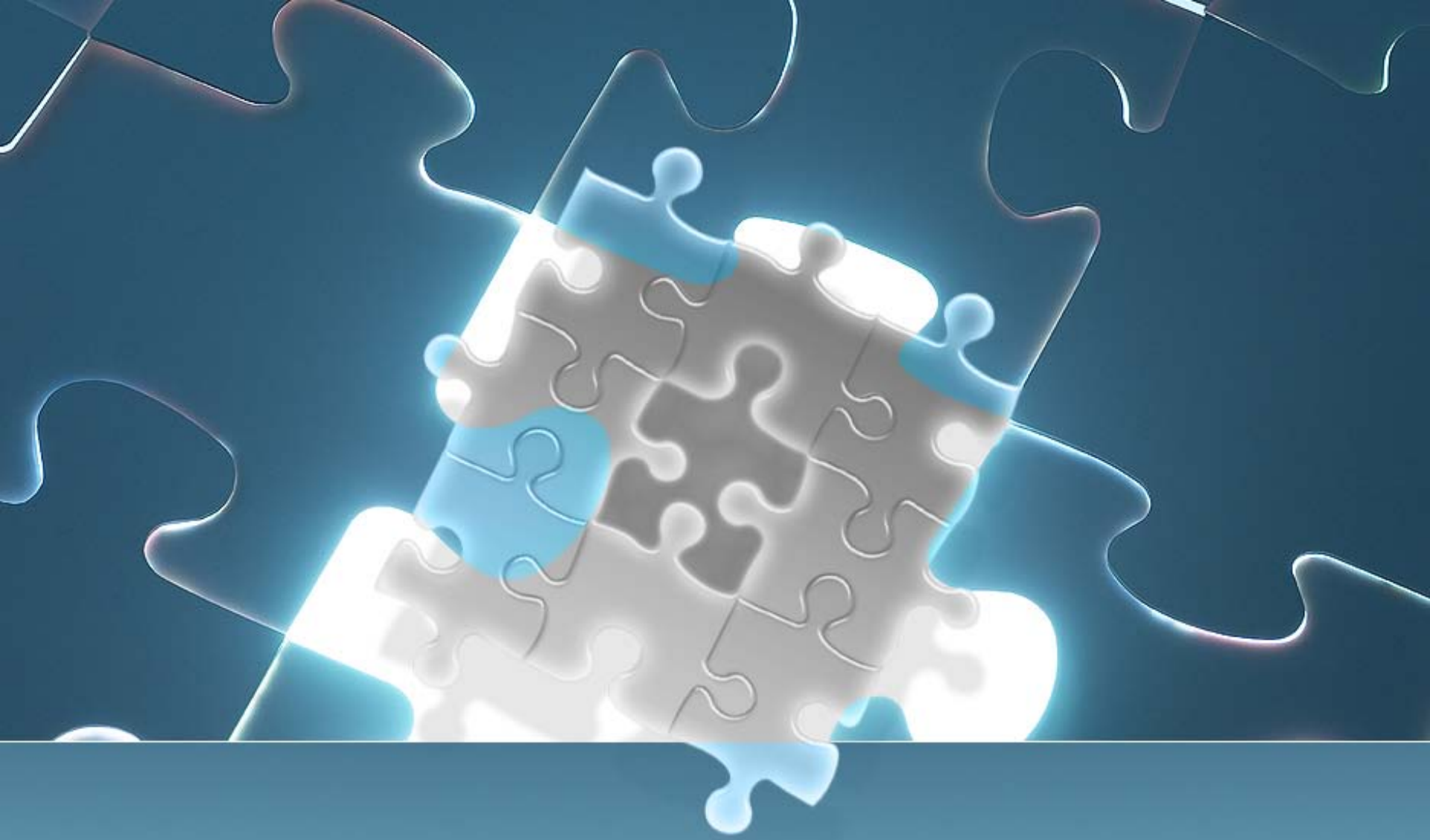

PLM Integration

Team Smith Kart Project

The Project

Design a structure by which the Team Smith Kart team can manage all of the elements of operations for manufacture of the Team Smith Kart. This design should include processes and procedures for product development, identification of appropriate software product for configuration management, supplier tracking, workflow and work results.


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Interdisciplinary Team

Reshma Gohil – Computer Graphics Technology

Daretta Henry – Industrial Technology

Sorraya Khiewnavawongsa – Industrial Technology

Mike Nash – Aeronautical Engineering

Rubina Nashine – Industrial Technology

Bhakti Sathe - Computer Graphics Technology

Regena Scott - Industrial Technology

Clayton Smith – Aeronautical Engineering

CGT514 – Product Lifecycle Management faculty advisors - Dr. Craig Miller and Professor Pat Connolly

Team Smith Kart Problems

- Communication & Data Silos
- In field technical problems
- Rework
- Co-ordination with suppliers
- Changes in product specification
- Tracking engineering changes

Problem Statement

- Team Smith found themselves starting from scratch each racing season
- There was a need to determine the nature of the operation process for the Team Smith Kart project
- Examine to what extent PLM strategies and tools could be instrumental in optimizing the kart performance
- Identify processes that would reduce operational risks aimed at integrating design, assembly production, operation and management

Solution Process

- Identify existing processes and activities
- Coordinate data
- Propose a configuration management architecture
- Introduce a PLM process to capture the lifecycle

Purposed CM Architecture

- ***Product:*** target object to be produced
- ***Product configuration:*** version of the product, specifying the detailed assembly composition of each configuration
- ***Part:*** supplied by various suppliers and assembled to form a product
- ***Part version:*** main object in CM, it also contains version hierarchy
- ***Supplier:*** industries providing various assembly parts

Proposed CM Architecture

- *BOM:* shows product composition structure
- *Work request:* request of work, identification of changes
- *Work result:* result of an activity
- *Activity:* actual work invoked by work order
- *Employee:* workers involved in activities

Collaborative Workflow Management

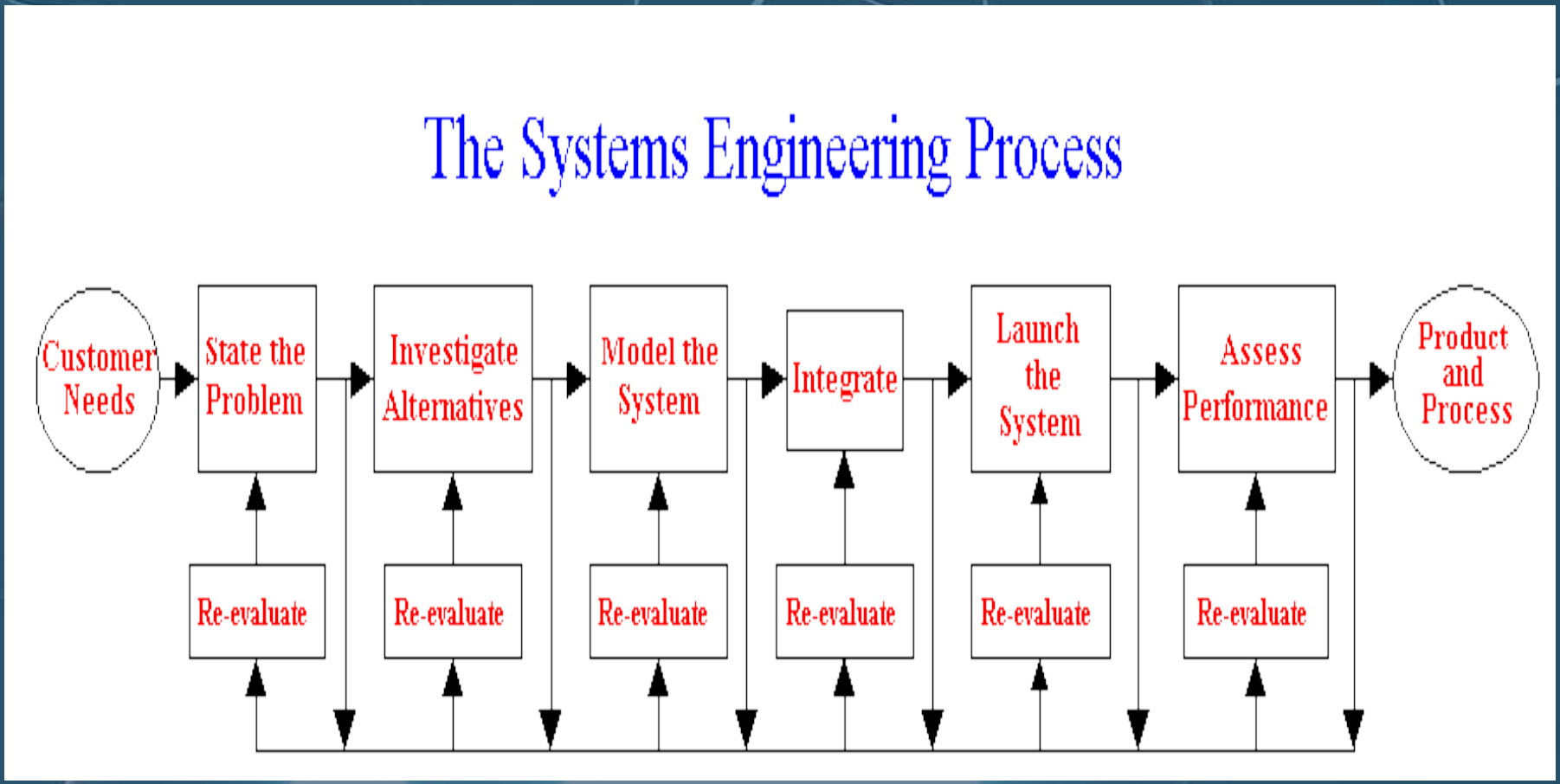
"On the basis of new information technologies, today's business evolves towards distributed and cooperative service processing resulting in a network of cooperative organizations...Both the characteristics of engineering processes and the interoperability between different organizations challenge the development of enabling technologies to support global engineering networking."

The MOKASSIN Approach

7 Systems Engineering Tasks

1. *State the problem*--The most important systems engineering task; Identify customers, understand customer needs, establish the need for change, discover requirements and define system functions
2. *Investigate alternatives*--Investigate and evaluate based on performance, cost and risk
3. *Model the system*--Clarify requirements, reveal bottlenecks and fragmented activities, reduce cost and expose duplication of efforts
4. *Integrate*--Design interfaces and bring system elements together so they work as a whole. This requires extensive communication and coordination

Systems Engineering Process



(Bahill and Gissing, 1998).

7 Systems Engineering Tasks

5. *Launch the system*--Run systems and produce outputs making the system do what it was intended to do
6. *Assess performance*--Use evaluation criteria, technical performance measures and measures. Measurement is the key. If it can't measured, it can't be controlled. If it can't be controlled, it can't be improved
7. *Re-evaluation.* Should be a continual and iterative process with many parallel loops

This process can be summarized with the acronym SIMILAR (Bahill and Gissing, 1998).

Global Markets and Customer Orientation

Product Lifecycle Management (PLM) Definition

CIMdata defines PLM as:

- A strategic business approach that applies a consistent set of business solutions that support the collaborative creation, management, dissemination, and use of product definition information
- Supporting the extended enterprise (customers, design and supply partners, etc.)
- Spanning from concept to end of life of a product or plant
- Integrating people, processes, business systems, and information

Core PLM Concepts

Three core or fundamental concepts:

1. Universal, secure, managed access and use of product definition information
2. Maintaining the integrity of that product definition and related information throughout the life of the product or plant
3. Managing and maintaining business processes used to create, manage, disseminate, share and use the information.

Observations and Recommendations

- Use a collaborative workflow management process to capture and coordinate all Team Smith activities
- Implement use of PLM software such as Dassault for consistent management of data

Results

- Compilation of a database of parts
- Introduction of design software system utilization
- Identified a configuration tracking process
- Coordination of supplier, manufacture and process data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Team Smith Crew