Singapore Institute of Manufacturing Technology
A*STAR

Product Design & Development Group

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Product Lifecycle Management

Background

	1980s	1990s	2000s
Competitive Focus	Margin	Market share	Market size
Product Strategy	Lower costs	Time to market	Collaborative innovation
IT Focus	Productivity	Data sharing	intellectual capital
Process focus	Serial design process	Concurrent engineering	Inter-enterprise collaboration
Organizational focus	Depart-mental	Project teams	Agile market teams

Figure 1: Evolution of business environment

To satisfy rapidly changing demands from customers, manufacturing industry has shifted from mass production, which takes advantage of the scale of production, to concurrent engineering, which optimises the internal enterprise processes, to virtual enterprise (VE), which leverages intellectual capital via collaborative innovation (Figure 1). In such a VE, companies need to closely collaborate with customers, manufacturers, and suppliers in a real time manner so as to provide customers with tailored products faster, better, and cheaper. The product itself is becoming one of the most significant assets and the effective management of product throughout entire product lifecycle is more important than ever before.

Methodology

Product Lifecycle Management (PLM)

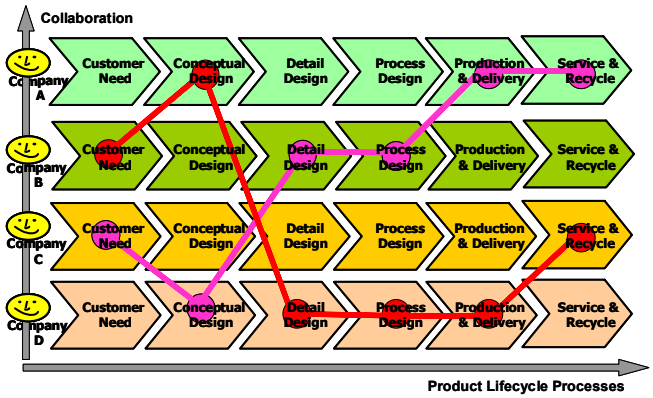

Figure 2: Collaboration in product lifecycle

As such, a systematic solution, named, product lifecycle management (PLM), which can provide customers, developers, manufacturers, and suppliers with the most effective services by collaboratively managing business activities throughout entire product lifecycle, is imperatively required (Figure 2). The PLM solution should support either the vertical collaboration throughout the entire product lifecycle, or the horizontal collaboration across different companies at each lifecycle processes.

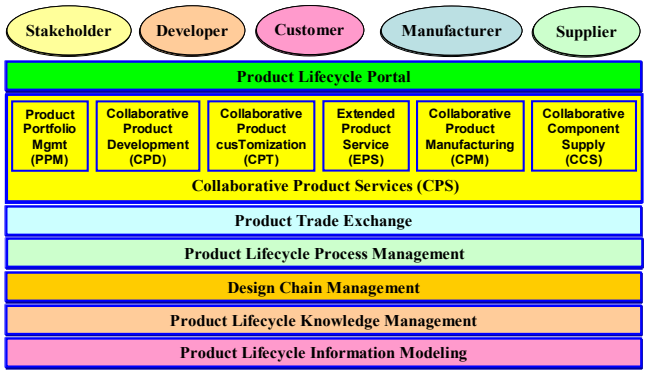

Figure 3: Technical building blocks for PLM

To provide dynamic collaboration among processes through the entire product lifecycle, the corresponding technical building blocks have been developed (Figure 3). The technical building blocks include

- Product lifecycle portal,
- Collaborative product services,
- Product trade exchange,
- Product lifecycle process management,
- Design chain management,
- Product lifecycle knowledge management,
- Product lifecycle information management.

The collaborative product services supports all the collaborative scenarios in the entire product lifecycle, i.e., product portfolio management, collaborative product development, collaborative product customisation, extended product service, collaboration product manufacturing, and collaborative component supply.

Findings/Achievements

Research into Integrated Process Planning for Simultaneous Engineering (INPROSE) has resulted in technologies and methodologies for

- Automated process planning for collaboration
- Concurrent integration of engineering systems
- Collaborative environment for design
- Unified enterprise resource modelling

Contact

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