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Title:

New Product Design Management with CPC (Collaborative Product Commerce)

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Abstract : New Product Design Management is becoming more and more challenging as the products have to address global customers with contemporary technology and short product life spans .This demands for customer centered product design and development and shorter product introduction times . A new category of web-enabled methodologies called Collaborative Product Commerce has emerged that is helping to create products by demystifying the development and involving select customers as product developers and innovators. CPC allows Organizations to significantly improve their core processes around the management functions associated with the complete product cycle.

Key Words :
Collaborative Product Commerce
Collaborative Product Innovation
Creativity
Virtual Enterprise
webcentric
Innovation

INTRODUCTION

New Product Design Management is becoming more and more challenging as the products have to address global customers with contemporary technology and short product life spans .This demands for customer centered product design and development and shorter product introduction times . A new category of web-enabled methodologies called CPC has emerged that is helping to create products by demystifying the development and involving select customers as product developers and innovations. CPC allows Organizations to significantly improve their core processes around the management functions associated thus demanding a new way of working .Collaborative product commerce is an all pervading activity and hence the New Product development through this method has very high success rate.

CPC involves a class of software and services that uses web-centric technologies to permit all enterprise participants (executives, engineers, vendors, markets etc.), with diverse roles, irrespective of their geographical location and technology platform to collaboratively develop, build, and manage products throughout their entire life cycle. What this means is that the parties connected have defined access to the product data at the design and development stage, so that they can chip in with their expertise in Real time to rapidly move to the manufacturing stage. The important distinction is that customers and vendors alike can be part of this process. The latter is particularly important as knowledge and technology is becoming increasingly sophisticated and is no longer the domain of the privileged few, further emphasizing the need for effective collaboration, however large and powerful the organization may be . In turn CPC would mean a faster response time to customer choice. It would mean faster innovations and faster time-to-market and most important lesser risk.

Benefits

The most obvious benefit of a CPC system is the quality and speed of product development. It allows discrete manufactures to collapse the time it takes to translate intellectual property of new product ideas into deliverable, commercially viable products. This superior ability to be the first mover usually translates into market share and profitability. CPC addresses an important issue in that a product design locks in cost that cannot be removed throughout its entire lifecycle. Research indicates that nearly 80% of the products cost are built in by the time the product file is released for manufacturing. This means no matter how efficient a discrete manufacturing enterprise due to initiatives such as ERP and SCM performs

it can only assist in lowering 20% of the products cost. CPC's ability to bring about efficiencies in engineering and design efforts could potentially bring about a more significant cost saving as compared to any of the downstream processes. The all pervading nature of CPC is illustrated in Figure 1

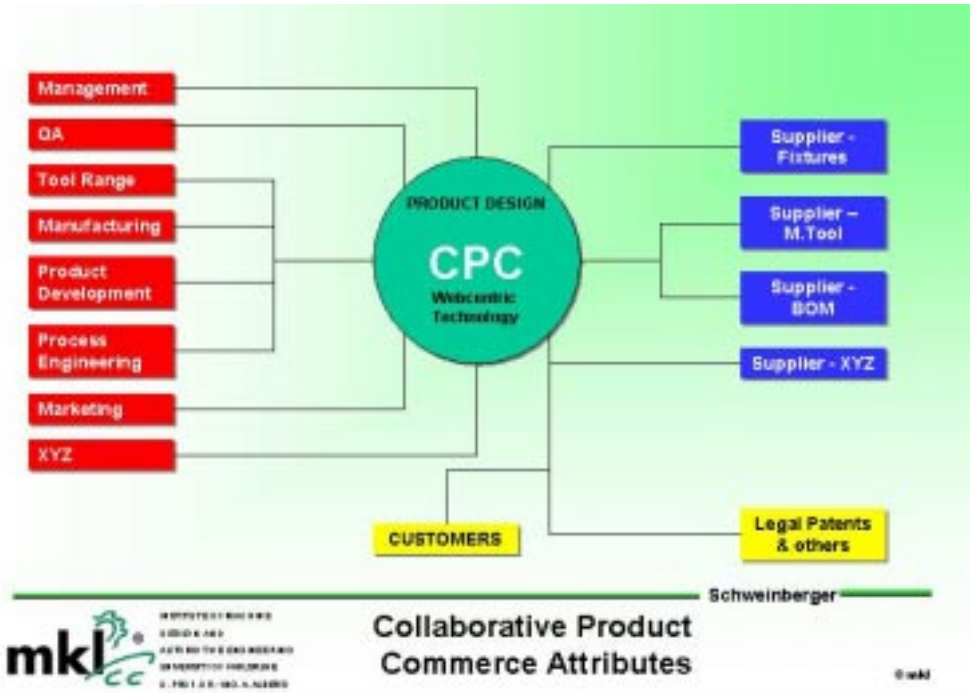

Figure 1: Collaborative product commerce attributes

CPC technologies also facilitate product information exchange among various heterogeneous systems. It can be commonly expected that product developers use best-in-class tools to perform their specific tasks, which make data interchange among the various data models difficult. CPC will allow individual contributions to work with their chosen tools while exchanging ideals and information with others who do not know the intricacies of their system. An example would be that designers use a sophisticated CAD program, and use CPC tools to allow a consolidated 3-D view to a non-designer for feedback.

An intrinsic benefit of CPC would be to make available product data, throughout its lifecycle from design to retirement, to all levels of the organization, to aid real time executive participation.

CPC Implementation Challenges

The first part of the challenge, quite obviously is technological. It requires a discrete manufacturer to commit to a Networked world, and the internet in particular. Executives must gain confidence that with the new technology, data and information will be secure and give wider access, to internal members, partners, suppliers and even competitors.

The second part is cultural, where organizations must accept that in today's world partnering is the key and that to be continuously successful suppliers and users have to build mutually beneficial relationships based on trust in their commercial environments. CPC represents a collaborative environment, however their needs to be a driver, which will establish processes and responsibilities that allow for surmounting organizational barriers while maintaining continuous focus on the products.

Collaborative Product Innovation

Introduction

With In the broad area of CPC we would focus on the innovation part and develop the methodology and process for achieving collaborative product innovation .The product innovation activity is becoming more and more important for enterprises. because of increasing competition caused by globalisation and individual customer-specifications. In contrast to this the life-cycle-time and the development time of a product have become shorter .

Product Innovation

The process of product innovation develops a correlation between target definition, planning, execution and controlling. It is characterized through a lot of interactions between the different steps which are connected by decisions. In this representation the steps are arranged in a logical order. Under the aspect of time a simultaneous execution of activities is undertaken thus paving the way for collective problem solving . For the support of these activities and processes appropriate tools and methods need to be developed.

For instance innovation has to be a all pervading factor and ideas have to come from all quarters of the product development process as illustrated in Figure 2

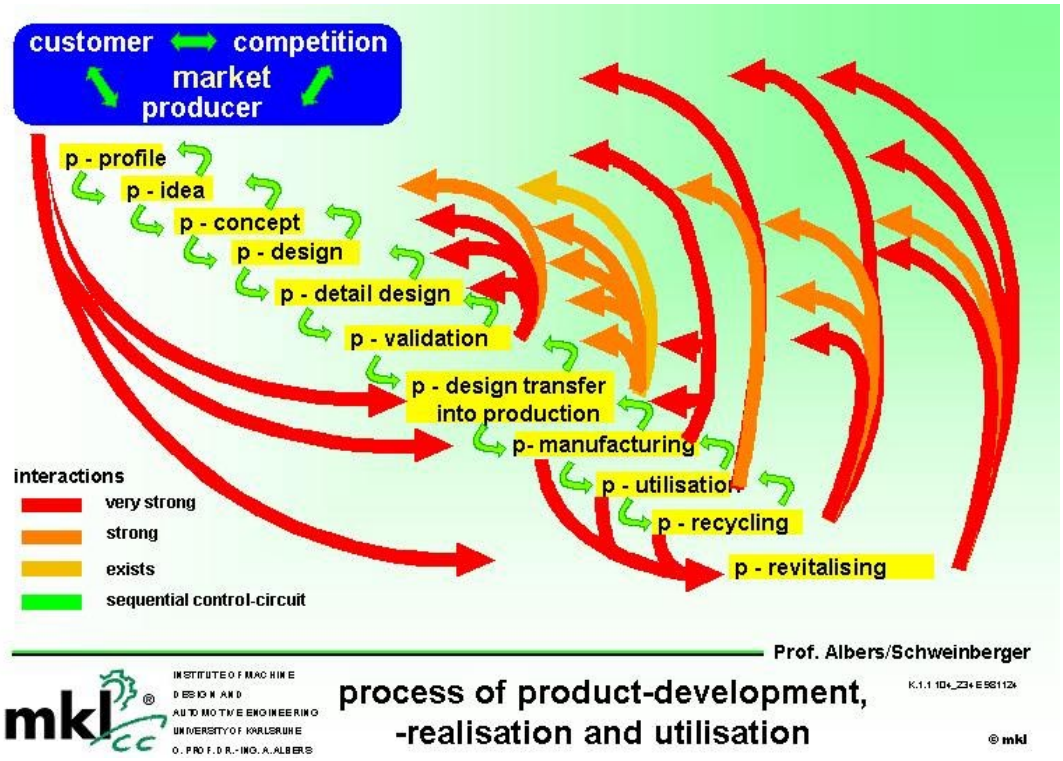

Figure 2: Innovation through Interaction in product development process

Outsourcing of non-core-competence-areas is a meaningful decision and can be seen in nearly every enterprise. As a result the product development process becomes divided up into several parts which have to be realized by different partners in fixed time periods. This causes a complex system of partnership which can be explained by the German automotive industry exemplarily.

System Suppliers

The situation of the suppliers is characterized by a growing development depth and an increasing constraint for innovation. The customer typically demands non-standard low-cost product solutions of high-quality. 1st level suppliers for example are forced to become system-suppliers with responsibility for product development and production . Among other things this fact causes the formation of cooperation-partnerships between suppliers of different levels.
From the bottom to the top of the pyramid enterprises have to face an increasing complexity of detecting problems in the customer-supplier-relationship. Especially in phases of creating strategies for future value sourcing the cooperation with the chosen partners is recommended. The enterprise strategies have to be adapted to the

new situation. In the phases of reorganizing the structures of value sourcing the influence of the customer and the partner(s) have to be considered.
The position of a 1st level system-supplier and its relation-network is exemplarily explained in Figure 3

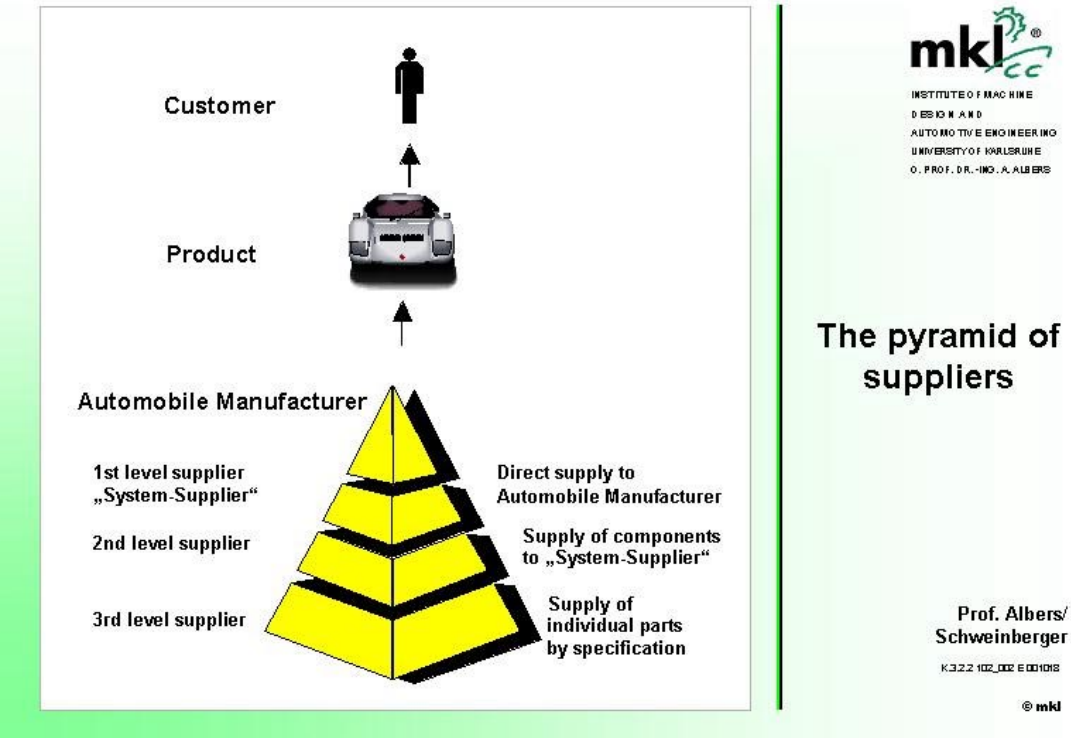

Figure 3: The pyramid of suppliers

Integrating System suppliers

Consider an example where in the total-system providers are automobile manufacturers and manufacturer of agricultural machines. Both are positioned in the first level of the pyramid (T). In this simplified representation three levels of suppliers are positioned below. The total-system providers have direct access to the systems of the 1st level-suppliers (S1).

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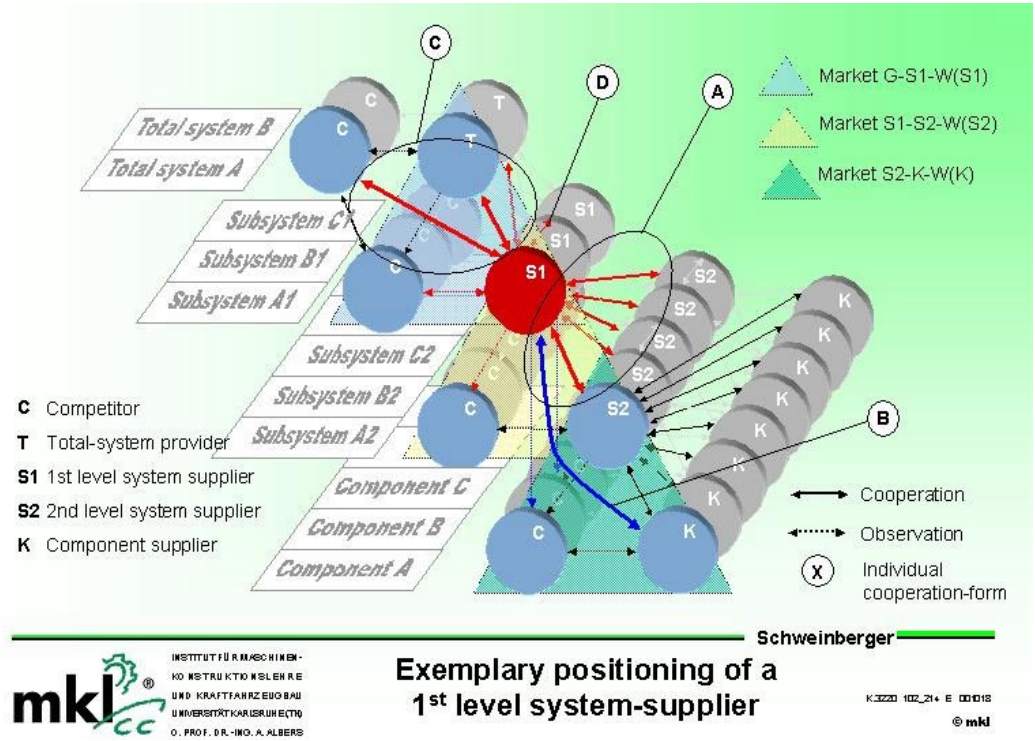

Figure 4: Exemplary positioning of a 1st level system-supplier

Exemplarily they are a group of specialized companies producing clutch-systems, transmissions and brake-systems. These system-suppliers receive parts of their systems from the 2nd level system-suppliers. Typical products in this level are bearings, lubricants or clutch coatings. The application field of these products is wide and requires an extensive know-how in different application-types. Components of these systems, for example screws or seal items, can be received from component-suppliers in the 3rd level. Independent of the positioning in this structure every company is in competition with other providers. In comparison with the own company the level of value sourcing in the ordering company is one or more levels higher. In the role of the customer those companies have the possibility to select the optimal cooperation partners. With the help of collaborative product commerce this selection expands to a world-wide process. The lower the level in which a company is positioned in the pyramid the more competition can be expected. Those companies are forced to secure their positions by developing special knowledge for example in production technology and be partners in the collaborative environment . To survive successfully the companies have to observe the competitive companies continuously and have to initiate appropriate measures for their own growth . The manufacturer of agricultural machines possibly receives bearings from the same company as the automobile manufacturer. The seal items of

the 3rd level supplier accordingly will be required for a multiplicity of system-suppliers in the 2nd level.
Inside these complex relation-structures the participants fulfill clearly defined tasks. Normally the high-level companies define the complete product functionality by themselves without input from specialized suppliers. They have to coordinate and assemble a multiplicity of subsystems which are developed by different lower-level companies. This mostly leads to problems, especially between the subsystems. Missing interfaces and misunderstood development tasks cause long modification processes.

Collaboration

The integration of suppliers in the product development process for a new product design and development activity will also tie up the total-system providers effectively. Especially in the field of product innovation the cooperation with competent specialists of selected suppliers offers a lot of opportunities for growth and development
Beside the mutual influence of the product development process by different core competencies the integration of selected partners has several advantages:
The common know-how of supplier and company is a good basis for creating successful system-solutions
Synergy-effects caused by mutual profit of knowledge and technological possibilities
Substantial improvement of the total product regarding innovation, costs and quality
Minimization of development time by simultaneous engineering
Division of development risks among the partners
Small capital requirement for financing of investments into common development-tasks
Cost-saving in appropriation of strange know-how
There are also several risks which have to be considered:
Risk of competence-loss by unwanted knowledge-transfer
Risk of a unilateral dependency of the partner with loss of strategically important flexibility
An important step to avoid loss of competence is the definition of the own competencies in the development-project. By achieving a trusting partnership the risk of a loss of competence can be also minimized.

Collaborative Innovation

Cooperating enterprises have the possibility to create crucial synergy-effects in product development especially in the early phases of the life cycle process. Merging know-how and different core-competencies of the enterprises are a good basis for product innovation. For the maximization of the creativity-potential the synergy of different specialized-knowledge and social-behavior among the involved persons has to be detected and managed. Only by this the available performance can be used optimally. Different IT-systems or special cultural behavior for example are parameters which have to be regarded also. There are a lot of other factors which influence collaborative work. Basic features of the companies strategic aims and legal restrictions have to be taken into account. There is also the need for a lot of organizational agreements between the partners and measures for problem-solving and innovation-support.

Collaboration and Virtual enterprise

Based on elementary cooperation-management knowledge the concept of an overall software-based management-system can be implemented step by step. Different modules support systematic search for potential companies
selection of optimal partners estimation of cooperation-specific chances and risks and problem-solving in the cooperation-process
For the successful implementation knowledge in mechanical engineering, information-technology, psychology and economics has to be examined and adapted to each other. Only by this a global action model for product designers in innovation-partnerships can be generated.

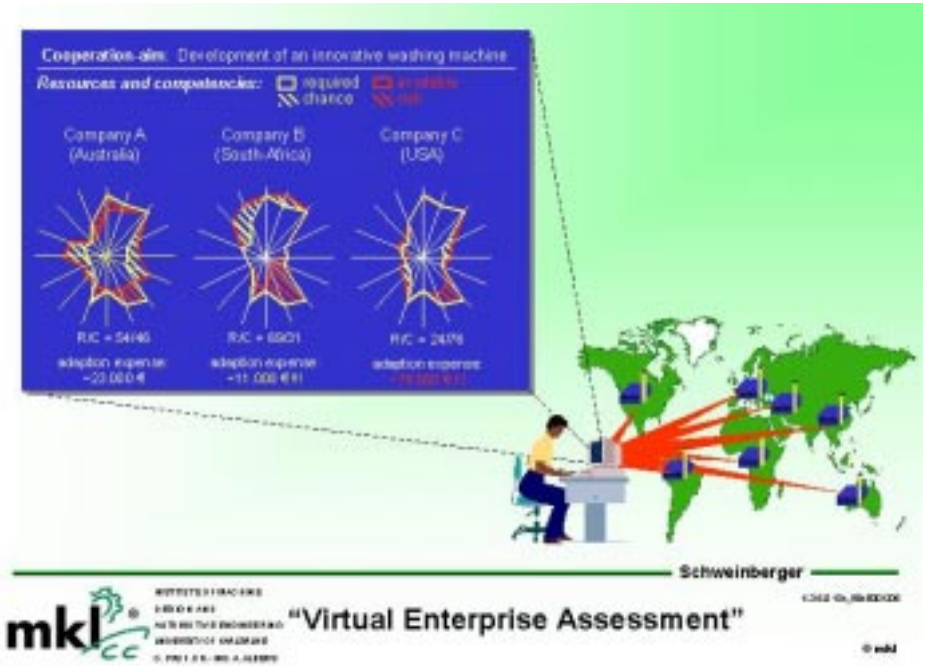

Figure 5: Virtual Enterprise Assessment

Virtual Enterprise Assessment

The virtual enterprise assessment is an internet based tool which allows the world-wide evaluation of companies regarding their suitability to innovation-partnerships as illustrated in Figure 5. Analyzed competencies and resource-profiles of enterprises can directly be compared with a requirement-profile of the innovation-task. Individual chances and risks of partnerships can so be detected in the apron of the cooperation.
In the concept generation phase to come up of with an innovative washing machine ,the concept for use ultrasonic technology could be picked up due to the virtual enterprise assessment thus showcasing the depth to which each stage of the product development process could go and aid innovation

Conclusion

The impact of technology and Internet is a force that no industry or commercial venture can stay away from. Organizations have to gear up to the fact that businesses indeed need to move at internet speed, and thus have product development strategies that address such needs. CPC is a powerful enabling technology that can actually make such strategies work and aid in the complete

product development process .The CPC tool will have to be implemented by following the right methodologies so that the tool is used to the advantage of the product development process.

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