
ABSTRACT

In competition business environment, companies recognize the importance of collaboration throughout the entire product lifecycle. The main focus of the paper is on the collaboration in New Product Development (NPD) processes and how Product Lifecycle Management (PLM) strategy are likely to paradigm support advanced collaboration strategies, such as Mass Customization and Customer Co-Creation. The relation between these strategies and product lifecycle phases related to New Product Development is made. This paper is study of the basis for the further research that communicated being pursued by the first author. Keywords: Collaboration, Customer Co-Creation, Mass Customization, New Product Development, Product Lifecycle Management .

KEYWORDS: Mass customization , Customer co-creation , NPD.

INTRODUCTION

In competitive dynamic business environment, there is a shift in how product value is developed and created. Companies' paradigms have released the importance of collaboration for creating and sustaining competitive advantage. The traditional view that is nothing but company-centric view is being replaced by the latest customer-centric view, creating a market environment in which companies and consumers cocreate experiences. The individualization with its social and financial dimensions is a precondition for the development of advanced collaboration strategies of industry. Mass Customization and Personalization becomes a common theme in collaborating with customers in New Product Development (NPD), where product designers' responsibility and capability shifts from designing a product to designing components which are then customized by the customer, the ultimate designer. Customer CoCreation represents a step further. Competition is based on a new approach to value creation, where consumers or customer want to interact with whole communities of professional service provider in industry providers and other consumers, in order to co-create value . Efficient NPD is facilitated through of adoption Product Lifecycle Management (PLM) strategy and contemporary software solutions . PLM is one of the best effective approaches for better, fast, smart and cheaper product development and management. The purpose of this paper is to identify key benefit and characteristics of collaboration in NPD by analyzing principal contributions to this emerging and upcoming field. After a overview and general discussion about collaboration and NPD, the paper is followed by PLM as the collaborative environment and its role in supporting advanced collaboration strategies, such as Mass Customization and Customer Co-Creation. relies on theoretical assumptions and some practical examples. The paper ends with some conclusions and propositions for further study. The first author's aims should to develop and extend some of ideas presented here into prepare differentiation evaluation of specific PLM statutory work for NPD.

COLLABORATION AND NEW PRODUCT DEVELOPMENT

Collaboration with partners, customers and competitors has become a strategic importance for companies in the networked world of business. Collaboration with customers expands several business processes, with the focus on collaborating to create value through NPD. Companies have always tried to "hear the voice of the customer". However, customers have traditionally played a passive role in NPD processes. In this traditional company-centric view:

- 1) The consumer is outside the domain of the value chain;
- 2) The enterprise controls where, when, and how value is to be added in the value chain;
- 3) Value is created in a series of activities controlled by the enterprise before the point of purchase of material;
- 4) There is a single point of exchange where value is extracted and evaluated from the customer for the enterprise. When customers are viewed as passive recipients of innovation and addition in product, the company has a limited understanding of customer knowledge developed within their specific contexts of experience and change. Collaboration enables the customer-centric view, where:
 1. The consumer is an integral part of the system for value creation in every industry;
 2. The consumer can influence where, when, and how value is generated of product;
 3. The consumer need not respect industry boundaries in the search for value in market ;
 4. The consumer can compete with companies for value extraction of product;
 5. There are multiple points of exchange where the consumer and the company can co-create value in addition

Since new products of every industry very often fail to match customer needs, improving interaction with customers during NPD process is an important challenge in order to reduce failure rates and to increase financial value from high investments. In this regards, customer co-creation in NPD process is an emergent aspect. Company is how much it can involve the customers into the NPD processes. Over the years, the degree of customers' involvement has increase - from the customer left outside of the creation of product value to co-development teams, Mass Customization and, most recently, Customer Co-Creation. Mass Customization alters the old traditional product development and moves towards a two-stage model. The first stage of traditional method is the realm of company/designer establishing the solution space and the second stage is that of customer as co-designer. This second stage fundamentally changes the role of the customer from consumer of a product of a company, to a partner in a process of adding value for NPD. Mass Customization enables companies to offer variety of product to customers and creates their emotional connection with the product. However, companies still decide what can be customized. Customization ultimately what can be built and delivered to suit the efficient operation of a company's value chain of a system. Even in the most delicate Mass Customization , the customer chooses from a menu offer by the company .twenty-first-century economy the focus should be centered on co-creation of unique value with customers. The customers role in the industrial system has been canceled from isolated to connected, from unaware to informed, from passive to active, and their great influence in value creation is supported by information access, global view, networking, experimentation and activism be means of feedback system. Customer Co-Creation is defined as an active, creative and social collaboration process between producers and user or customer, facilitated by a company, in the context of new product or new service development. The Information and Communications Technology ICT, the Internet in particular, is forcing companies to think differently about value creation and to be more responsive to consumer experiences. Customer Co-Creation should not be confused with the transfer or outsourcing of activities to customers, or the marginal customization of goods and services of product. Rather co-creation is a value creation process in which suppliers or company and customers engage in interactions to exchange knowledge and resources in order to co-create value of product. Since new products of every industry very often fail to match customer needs, improving interaction with customers during NPD process is an important challenge in order to reduce failure rates and to increase financial value from high investments. In this regards, customer co-creation in NPD process is an emergent aspect. Company is how much it can involve the customers into the NPD processes. Over the years, the degree of customers' involvement has increase - from the customer left outside of the creation of product value to co-development teams, Mass Customization and, most recently, Customer Co-Creation. Mass Customization alters the old traditional product development and moves towards a two-stage model. The first stage of traditional method is the realm of company/designer establishing the solution space and the second stage is that of customer as co-designer. This second stage fundamentally changes the role of the customer from consumer of a product of a company, to a partner in a process of adding value for NPD. Mass Customization enables companies to offer variety of product to customers and creates their emotional connection with the product. However, companies still decide what can be customized. Customization ultimately what can be built and delivered to suit the efficient operation of a company's value chain of a system. Even in the most delicate Mass Customization , the customer chooses from a menu offer by the company . twenty-first-century economy the focus should be centered on co-creation of unique value with customers. The customers role in the industrial system has been canceled from isolated to connected, from unaware to informed, from passive to active, and their great influence in value creation is supported by information access, global view, networking, experimentation and activism

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COLLABORATIVE ENVIRONMENT FOR PRODUCT LIFECYCLE MANAGEMENT

Collaborative environment at the highest level can be viewed as a framework to connect people of different departments and communicate data and processes (Information). This integration cannot happen without the PLM framework since people, process and data is all centered on a product and the product lifecycle management includes interaction between people, process and information. The catchword of PLM is collaborative 344work within product design processes in order to fully integrate all the partners and all associated knowledge effectively. PLM facilitate customers, developers, manufacturers, and suppliers with the most efficient means by collaboratively managing working business activities throughout entire product lifecycle. PLM supports the capacity of collaborative creation, management, dissemination and use of product assets which includes data information and knowledge about product through. In virtual company integrating people, processes, and technology of a product. PLM is a concept based on horizontal business processes to vertical business units in organization or industry. These business units or processes are linked with or based on product life stages processes. Implementing a valuable and successful PLM strategy requires re-alignment. The vision of PLM is to provide outstanding R&D performance during NPD. This is achieved through the three drivers, management efficiency, process excellence and technology effectiveness of PLM. In today's global business environment, product development is highly dependent on knowledge and collaborative systems for building on specialized knowledge across department, organizations, and job to develop customized products for different market needs. A knowledge support system, like PLM, can give a solution to support NPD processes by sharing and repeats knowledge related to these processes. PLM provides work systems that enable real-time collaboration and collaborative New product development, web conferencing, simultaneous modifications and virtual product visualization. Virtual environments increase the speed customer engagement, as it happens in real-time, and with a much higher efficiency. Customers have the very important role in each stage of the product lifecycle, from concept generation to maturity and disposal. However, have vital question to order wise - How early the customers get involves into the product lifecycle? The degree of product customization and personalization depends on the solution of this question. When customer involves earlier into the NPD, increases the degree of customization and personalization. If they get involved in the earliest stages of NPD, the product customization tends towards personalized experience value and knowledge co-creation of a products framework there are two criteria: (1) The degree of the personalization of the value created for a product, and also (2) The point where value creation occurs in industry. According to this framework, Mass Customization can be defined as a concept that provides the customer with a limited set of industry determined choices with which the customers can personalize or set a standard product or service template. On the other side, Personalized Experience Value and Knowledge Co-Creation are defined as a concept where the organization and customers contact within an experience environment to realize unique co-created value of a product.

The main objective of collaboration is to solution better the questions of time to market, cost and quality criterion, which can be accomplished with the support of PLM in industry or company. As a business strategy of industry, PLM enables companies to bring best business practices and valuable intellectual capital for systematic and repeatable creates reposition of. This is supported by PLM information systems by means of product data that generate similar data structures that enable real-time collaboration and data sharing along all departments and users. These properties of PLM systems are crucial in supporting advanced strategies for collaboration, such as Mass Customization and Customer Co-Creation in any organization. PLM facilitates these strategies for collaboration by enabling to rapidly and less cost effectively deliver customized and co-created offerings by product that satisfies the needs of individual customers and targeted market segments of organization.



Fig. 1. The position of Mass Customization and Co-Creation in the framework of eight styles of firm-customer knowledge co-creation

Mass Customization in PLM environment.

Mass Customization strategies include different information systems to support them, and the collection of these information or data of systems the entire supply chain plays an essential involvement in the successful implementation of Mass Customization during NPD.

Required functionalities for such an information system is as follow :

- (1) presence of collaborative product development in company;
- (2) collection of knowledge about clients in data files;
- (3) virtual enterprise environment in industry .
- (4) provide enrichments to clients from company;
- (5) providing open system architecture in departments in system.

PLM systems give these essential functionalities along with all users. They have the ability to support Mass Customization, by catching Voice of the Customer (VoCs), transforms from integrated product requirements and efficiently managing those requirements in industry, by combining the advantages of configuration management. Supported by PLM solutions, product configurators are useful to translate customer needs to product designs in order to give a final solution based on product realization knowledge and they represent the design tools that are provide a guidance to the user through the configuration process of industry.

Customer Co-Creation in PLM environment .

Co-Creation involves giving customers the authorization to participate in the design of their own experience, not only by giving input about their preference as in old market research, but also by giving them tools that allow them to become actual designers. Siemens PLM Software has a partnership with Local Motors, an America’s car company employing a distinctive, collaborative view to vehicle design, that leverages a global, open, design department that contributes to the definition and design of an automobile along with all departments. The five “Co-s” model includes five phases of Co-Creation: co-ideation, co-valuation, co-design, co-test and co-launch. The “Co-s” for innovation can be seen as different phases of the innovation processes Local Motors has proven that whole vehicles and components can be designed, engineered and construct with successful results through

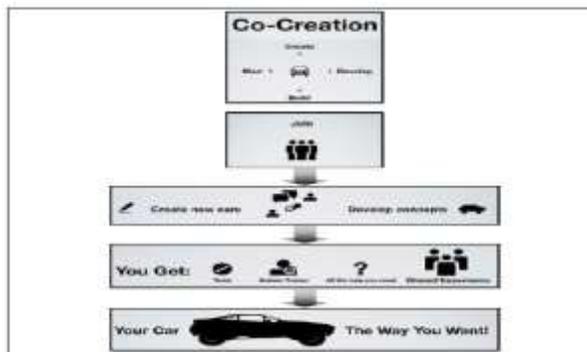
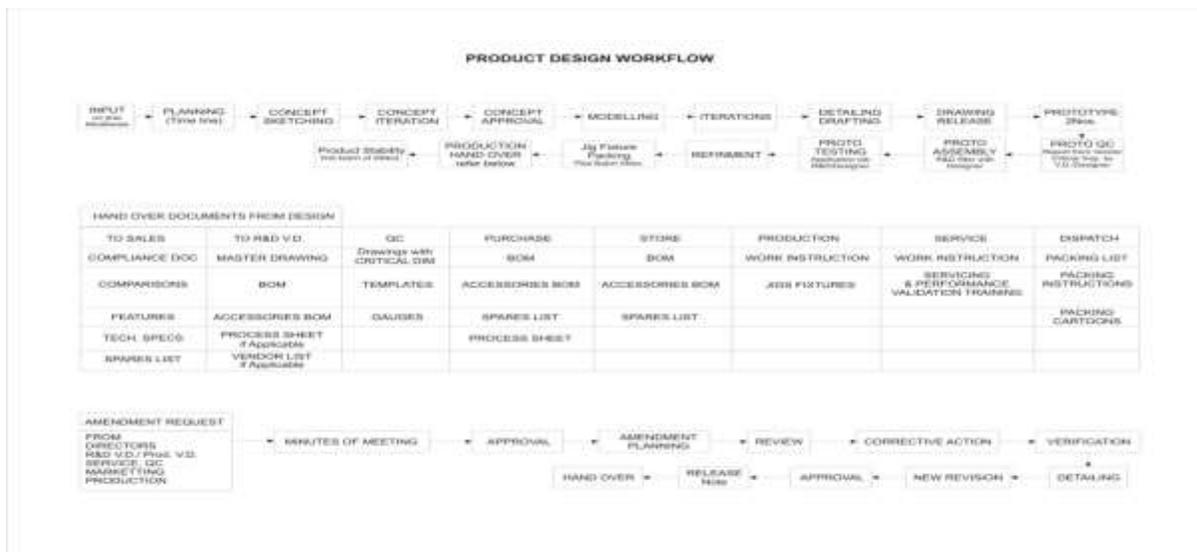


Fig. 2. Local Motors Co-Creation Model

Requirement: Implementation of Integrated System Schedule Manager for Project Management, Work flow for Mapping the Process for NPD along with Change Management Process Electrolab established in 1984, manufactures testing equipment of pharmaceutical and peristaltic pumps has demands in several industries. Export capacity of Electrolab is 50% of its product Company expect from TeamCentre that product data for NPD process should flow as following process.



CONCLUSION

1. Apart from competitive products, flexibility, quick innovation and knowledge application, companies also need IT support that incorporate principles systems more sensitive to the customers' perception of value. Collaborative virtual environments enable capturing and managing.
2. customer knowledge. Mass Customization, experience and Customer CoCreation are the most important and influencing collaborative strategies nowadays in industry required to implement PLM, considering that Co-Creation gives customer's involvement earlier in the product lifecycle steps related to product development, confirms higher product value for development of organization .
3. There are some research on Service Lifecycle Management(SLCM) which could involve the service community, on-going service solution for co-creation of revised service offerings. SLCM and PLM can be taken as the basis for further process of research, that will encompass the parallel development of models of both product and service
4. co-creation, emphasizing the similarities and differences between them. and SLCM need to be taken.

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