

Co-Creation and Co-Innovation in a Collaborative Networked Environment

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Abstract. Leveraged by the advances in communication and information Technologies, producers and consumers are developing a new behavior. Together with the new emerging collaborative manifestations this behavior may directly impact the way products are developed. This powerful combination indicates that consumers will be involved in a very early stage in product development processes supporting even more the creation and innovation of products. This new way of collaboration gives rise to a new collaborative networked environment based on co-creation and co-innovation. This work will present some evolutionary steps that point to the development of this environment where prosumer communities and virtual organizations interact and collaborate.

Keywords: Prosumer, Collaboration, Co-Criation, Co-Innovation.

1 Introduction

In the last recent years the globalized world has experienced its most amazing and rapid technological evolution. The repercussions and consequences of this (re-) evolution are many and can be seen and felt in the behavior of the enterprises and consumers. For enterprises, new organizational structures are taking place contributing even for the emergence of a new scientific discipline called Collaborative Networks. For consumers, a more active - and less reactive - role is gaining evidence and being directly influenced by the advances on information and communications technologies. The new web generation is participating in a silent movement of creation of prosumers¹.

As a consequence of this change in the behavior of the enterprises and consumers, a new space comes up with a high potential to be exploited. This space is called in this work as: products co-creation and co-innovation environment. It is an environment based on an innovation and creating value model, i.e., a model in which mostly collaborative activities take place.

¹ Prosumer is the result of the contraction of the words: producer + consumer, Toffler (1980)

In this sense this paper presents the surrounding and the evolution of the enterprises and the consumers (section 2) as well as analyses the requirements for the emergence of a collaborative production model where consumers are actively involved since the product design (section 3). In the sequence, having the innovation aspects on mind, the paper introduces the new actor of the proposed co-creation and co-innovation environment (section 4) and finalizes with some concluding remarks (section 5).

2 The Evolution of the Producers and the Consumers

Product is an item that ideally satisfies a market's want or need; a **consumer**, also called as client, or purchaser is the buyer or user of the paid products of an individual or organization; and a **generation** can be considered a stage or degree in a succession of natural descent and also stages of successive improvement in the development of a technology (WIKIPEDIA, 2009).

As production and its means evolve, the same happens with the generation of people to whom it serves (Fig. 1). This is mostly reflected by the evolution of the products themselves. But how about the interaction between producers and consumers? Did it also evolve? The next sub-sections present some aspects related to this question.

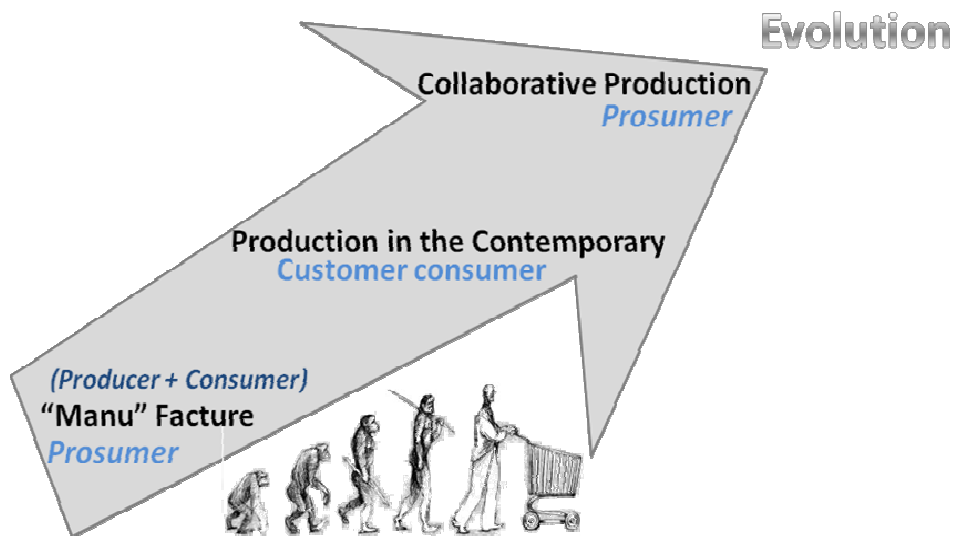


Fig. 1. Producers and consumers' evolution.

2.1 “Manu” “Facturing” and the Prosumer

Prior to the eighteenth century “manu” “facturing” (in the real sense of the word, i.e., hand-made) was the only kind of production that was known. The artisans of technology of the Modern Age (1453 – 1789) were simultaneously responsible for product development and design, planning and manufacturing (PEREIRA-KLEN et al. 1993) as well as sales and after-sales activities. The available technology was very rudimentary. The producers at that time were often themselves their own consumers, that is, they produced for themselves.

During the Modern Age, and the times that preceded it, the majority of people ate what they produced. It was a "production for use". That is, people were neither producers nor consumers. They were what Toffler (1980) called *prosumers* (contraction of producer + consumer). There was, as Toffler said, a small quantity of production for exchange, i.e., for the market. But the production for use was predominant. And even when production was to exchange (or sale), the consumer had a great influence on the producer.

The events of the second half of the eighteenth century, as the Industrial Revolution, the independence of the United States and the French Revolution, helped to inaugurate the Contemporary Age. The increasing importance of trade and of capitalism at that time was one of the main reasons that contributed to separate the activities of the prosumers giving rise to what we now know as producers and consumers (TOFFLER, 1980).

2.2 Production in the Contemporary Age and the Consumers

Thanks to the invention of the steam engine there was an empowerment of the development of science and a considerable increase in the production through the manufacturing of clothing, shoes and other items. The ability to efficiently produce large quantities of products has improved as time passed by and with the studies that were being carried out. The studies of the Frenchman Perronet in 1760 and of the English mathematician Charles Babbage in 1820 on time and motion (CHANDLER and DALMS, 1980; BABBAGE, 1963) together with the classics "The wealth of Nations" (SMITH, 1776) and "Principles of Scientific Management" (TAYLOR, 1911) served as catalysts for the mass production.

At the beginning of the twentieth century Henry Ford, considered the creator of mass production, made use of assembly lines to allow the production of low unit-cost manufactured goods (ROCHA, 2003). This was an important trigger to the modern consumer culture we know nowadays. This means that with the born of the mass production, the consumer has also born.

Around 1950, Taiichi Ohno, went to the United States to study assembly lines of Ford. He soon realized that mass production in Japan would face major problems. Thus, in his return to Japan, along with his colleagues at Toyota, Ohno developed the Toyota Production System (GHINATO, 1996) that revolutionized, once again, the manufacturing models. This was the emergence of the world-wide known “Lean Manufacturing”.

With the flexibility given to the idea of Ford, the “Lean Manufacturing” concept has gained notoriety in the west mainly at the end of the 1980s and at the beginning of the 1990s with the publication of the modern classic "The machine that changed the world" (WOMACK et al., 1990).

Still in the early 1990s, manufacturing gained new contours. It became “agile”. The researchers who developed the term "agile manufacturing" (GOLDMAN, et al., 1991) were asked by the north-American Congress to conduct a study to define the bases of the industries of the next century (or the 21st century, in which we are currently today). The study should define how the US companies could become again internationally competitive, facing the new industrial potencies - mainly Japan.

In the report entitled "21st Century Manufacturing Strategy", the researchers foresaw an environment characterised by uncertainty and constant change. That is, they predicted challenges which needed to be faced in a different way. Thus the agile manufacturing emerged with the objective of developing agile properties (KIDD, 1994a and 1994b). This agility is then used to achieve competitive advantage and, therefore, to respond quickly to changes that occur in a turbulent market environment making use of the ability of people to use and exploit the fundamental resources of knowledge. Kidd defines agile manufacturing as the integration of organization, highly qualified people and advanced technologies to obtain cooperation and innovation in response to the need to supply customized and high quality products to consumers.

The decades of the 80s and 90s were very fruitful in terms of production models. This was also the time where mass customization was born. Despite being considered a relatively recent business strategy (VIGNA, 2007) the mass customization was envisaged in the middle of the eighties and emerged in the business environment in the middle of the nineties. The mass customization appeared to break some paradigms of the manufacturing reality: to offer customized products and/or services at a cost similar to that would be achieved by mass production.

Finally, it is worth to mention that consumers’ society of the Contemporary Age was influenced by several factors. This consumers’ generation has evolved to a similar extent as also did the marketing techniques, production technologies, financing methods as well as to the extent that the design has become even more important. Nevertheless the behavior of the Contemporary Age consumer in relation to companies of the same Age is predominantly passive. This means that the involvement of the *pre-internet* generation in the product life cycle is minimal or practically nonexistent. With the emergence of the internet and soon after with its popularization (something around 10 to 15 years ago), the behavior of consumers has changed. The consumer is now adopting a more collaborative behavior. And together with the advent of Web 2.0 they form the basis for the comeback of the prosumer, which is described in the next sub-section.

2.3 The Collaborative Production and the comeback of the Prosumer

The evolution of the mass production paradigm to new ones is close related to technological development of productive systems and the advances of information

technologies. The facilities offered by these technological improvements have a fundamental role in all this transition and evolution process.

Recently with the emergence of collaborative networks one more paradigm was broken and a new one arose. As a direct consequence of globalisation and the advances in the information and communication technologies companies had to adapt themselves and to change their way of doing business. The production became collaborative. Companies join into networks to share skills and resources in order to achieve common goals. And all that with the essential support of the new technologies (CAMARINHA-MATOS and AFSARMANESH, 2006).

The collaborative networking, also called *peering* by Tapscott and Williams (2006), is defined as a new way of producing goods and services through the use of the mass collaboration strength. In this sense, in the current society - triggered by technological advances - billions of people may cooperate and collaborate to carry out almost everything that requires human creativity, a PC and internet connection. Differently from the past, when the costs of production were high, people today can collaborative produce and share their creations at a very small cost. We are, now, in the era of co-creation and co-innovation. An era that is driven and leveraged by the power of the internet.

The companies need to understand this new web generation in order to remain competitive. They need to analyse and assess how co-creation, co-innovation and self-organized production may be introduced in their businesses. This new business and collaborative production model should be conceived within and outside the companies. The relationship among companies and the web generation needs to be more intense, interactive and dynamic in order to facilitate collaboration.

3 Prosumers and the CN Environment

Functional organization designs, which have served us so well for so long, together with matrix and partnership variants, are being rapidly marginalized. This is happening as increasing competitive intensity in many industry-market combinations drives consumers towards more aggressive and demanding buying behaviours (GATTORNA, 2006). Additionally the consumers are playing a more active role in recent times. This change in their behavior is directly influenced by the easy access and use of new tools based on information technologies and communication.

The new technologies also influence the companies and their way to produce. Paradigms are broken and new ones arise. The borders of the companies become tenuous and – in some moments – tend to disappear. The smart companies (TAPSCOTT and WILLIAMS, 2006) try to bring their consumers to their business networks and giving them leadership roles in the development of their next generation of products and services.

Consumers start behaving as prosumers and this silent movement gives rise to an environment based on an innovation and value creation model where collaborative activities predominate (Fig. 2). In this environment the exchange of ideas and views between the people via their social networks stimulate the creation of communities of prosumers. The interaction between these people generates valuable information for

the productive sector and, with the support of the current available technologies, allows the involvement of the prosumers in the process of co-creation and co-innovation of products.

The prosumer community can be understood as a specific manifestation of Professional Virtual Community (PVC) (CAMARINHA-MATOS and AFSARMANESH, 2005). This community interacts in an integrated and active way with the virtual organization (VO) (CAMARINHA-MATOS and AFSARMANESH, 2004) which, in turn, is created from a VBE (CAMARINHA-MATOS and AFSARMANESH, 2004; SÁNCHEZ et al., 2005) in order to attend not only to the expectations of the consumers, but also – and most important – to the specifications of the prosumers. It is important to highlight that trust building (LOSS et al., 2007) is an important and essential component to leverage the co-creation and co-innovation.

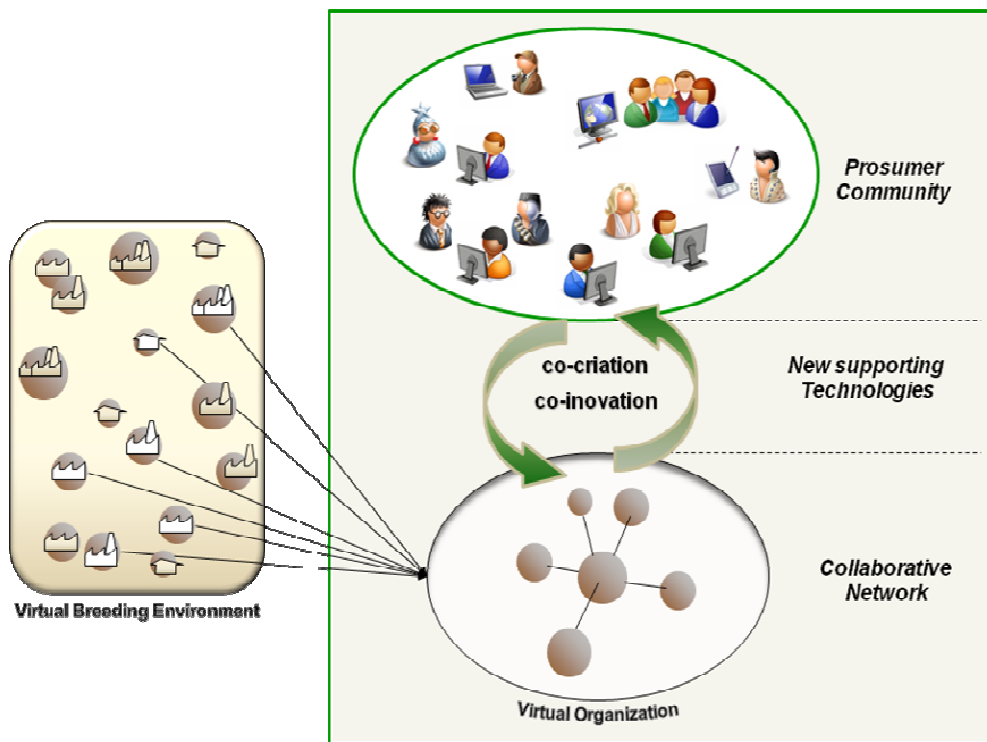


Fig. 2. Products co-creation and co-innovation environment.

4 A New Actor

The new mass collaboration is changing the way in which companies and society make use of the knowledge and of the ability to innovate in order to create value. This closer and faster contact to the wishes and expectations of the new web generation will also require changes in way companies are managed. A more collaborative management model will be required. Governance principles and intellectual property rights will have to be re-analysed and re-assessed.

Prosumers have a stronger voice and a direct contact with the companies (Fig. 3). The companies have to prepare themselves to hear, to analyse and, when adequate, to implement the proposed suggestions and modifications in the products.

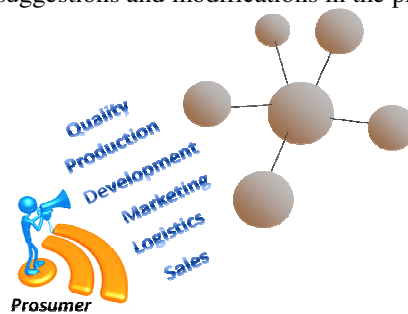


Fig. 3. Products co-creation and co-innovation environment.

After all, according to Gattorna (2006): “If we are sensitive to customer needs and buying preferences, it will be obvious what we have to do, we won’t have to worry so much about our competitors – they’ll be worrying about us”.

5 Conclusions

The work presented in this position paper analysed the evolution and the transformation of the production systems and the behavior of the consumers in the last 5 centuries. Starting with hand-made production and ending up in the recent years with a collaborative production model enabled by the advances of information and communication technologies. Starting with prosumers and ending up with prosumers again, but in a complete different environment. The new environment is not composed of artisans anymore. It is made up of companies and consumers. One working alongside the other and both co-creating a new generation of products.

This collaborative networked environment is challenging and new. Many aspects still have to be deeply and further studied. But if one considers what has already been done in the areas of ambient intelligence and cloud computing we realize that this co-creation and co-innovation environment is not so far away from us.

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