

Creativity, Invention, and Innovation



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INTRODUCTION

Creativity is part of the process of innovation. The main difference between both lies in the fact that innovation can be the result of the adaptation of something existing outside the organization - Open innovation (Chesbrough, 2003) -, not implying a creative behavior by the organization. In any case, most innovations result from creative processes, individual and collective, spontaneous or intentional (Baxter, 2000). Creativity¹ is based on reasoning that produces imaginative new ideas and new ways of looking at reality.

Innovation is defined as the application of new knowledge, resulting in new products, processes or services or significant improvements in some of its attributes (Leonard-Barton, 1995; Leonard & Swap, 1999; Kelley & Littman, 2001, 2007). It became an instrument of competition between businesses that search the market for the acquisition of increasingly sophisticated and developed products (Burgelman, Christensen & Wheelwright, 2009; Christensen, Anthony & Roth, 2004).

This development has led to new innovations in shorter and shorter time periods (Jolly, 2003, 2009). The companies were forced to find new solutions and became aware that new technology was the only solution (Sarkar, 2009).

Old inventions can generate new ideas (Adair, 2011; Jolly, 2003; Michalko, 1991), inventions never marketed can become real products and satisfy needs and desires, inventions for one application can be introduced in a new domain (Koch, 1991) and technologies can be applied in ecological sustainable solutions to develop 'green' products.

After describing these concepts, a short description of some of the most important creativity and idea generation techniques will be presented.

BACKGROUND

Creativity, traditionally, was related with the Arts and wasn't credited for its value in business (Majaro, 1990; O'Dell, 2004). The creatives were painters, designers, musicians, and sculptors, never allowed to be part of the board of a company, unless that company had something to do with the Arts itself. People use to think that creativity was a characteristic that someone had at birth. Or you have it - being born with it -, or you don't. Recently, creativity is seen as very important in the business world (Van Wulfen, 2013), showing that creativity is useful and can be of great use in other areas than just the artistic world. Advertising started to use some of the tools that designers and musicians use to embed in their activity and the results were positive (Roman, Maas & Nisenholtz, 2009). Marketing used it also in communication and new product development² strategies with excellent results (Duailibi & Simonsen Jr., 2005). But, only when Apple obtained its big success with iconic products like the iPod, the iMac, the iPhone, and now the iPad the role of creativity in design and new product development became crystal clear (Andrew & Sirkin, 2008; Isaacson, 2011; Skarzynski & Gibson, 2010). Apple was, in fact, the first big company with its Head of Design - Sir Jonathan Ive - sitting at the Board right next to the Heads of Operations, Finance, Marketing in an equal position (Cruikshank, 2008; Isaacson, 2011; Lashinsky, 2012).

Now, we believe that everybody can be creative (Adair, 2011). Learning to use the right tools makes us more creative than we thought we were (Lafley & Charam, 2009). Creativity is being used in all aspects of life, like: education, business, entrepreneurship, social media, non-for-profit organizations, fund raising and sponsorships (Andrew & Sirkin, 2008; Skarzynski & Gibson, 2010).

Information is the food for thought of the creative activity (O'Dell, 2004; Van Wulfen, 2013). Relevant, actual, and quality information can nurture new ideas,

new combinations, and new insights, producing new solutions for complex problems, allowing new inventions that can be transformed in innovations to ease people's life or making them more enjoyable (Lafley & Charam, 2009; Van Wulfen, 2013).

Information technology in all its amplitude and reach is an important tool in disseminating information³, ideas and cross pollination that can originate new technologies that will ease information to reach wider audiences (Burgelman, Christensen & Wheelwright, 2009; Earl, 1998; Hinton, 2006; Schilling, 2013), that will use them to create new technologies, in a perpetual cycle that will increase its value time after time as we can see with companies like Google, Apple, Facebook, Twitter, LinkedIn and all the others that have surged thanks to other technology, the Internet (Ryan & Jones, 2013; Sheehan, 2010).

Technology can also be used to stimulate creativity using mind-maps (Leonard & Ambrose, 2013).

INVENTION AND INNOVATION

We should make a distinction between the concepts of innovation and invention⁴. By invention we mean the creation or discovery of a new idea, including the concept, design, model creation or improvement of a particular piece, product or system. Even though an invention may allow a patent application, in most cases it will not give rise to an innovation. The innovation refers to something new, for example a new invention, which is placed on the market to the consumers benefit (Trott, 2008).

Innovation is defined as the application of new knowledge, resulting in new products, processes or services or significant improvements in some of its attributes (Leonard-Barton, 1995; Leonard & Swap, 1999; Kelley & Littman, 2001, 2007). It became an instrument of competition between businesses that search the market for the acquisition of increasingly sophisticated and developed products (Burgelman, Christensen & Wheelwright, 2009; Christensen, Anthony, & Roth, 2004).

This development has led to new innovations in shorter and shorter time periods. The companies were forced to find new solutions and became aware that new technology was the only solution (Sarkar, 2009).

Innovations can be of three types: 1) incremental - which are technological improvements that occur continuously, resulting from activities of R&D, the work of corporations' design and engineering departments and suggestions from users; 2) radical - resulting from discontinuous events and the product of R&D work; 3) systemic - whose amplitude affects the economy as a whole.

From the point of view of its nature, innovation can be seen as being on: a) process - adding new operations necessary for the company to produce a product, aimed at increasing productivity, reducing costs and improve quality; b) product - introducing new products or alterations by aggregating knowledge into existing products, especially in industries that compete for product differentiation; c) organizational - changing the way we organize and distribute the work in a particular department or service (Castro, 1999, p. 22).

We can therefore say that an invention that does not give way to something that is made available to people to satisfy a particular need, be it a product or service, will never translate into an innovation (Rogers, 1995; Mohr, Sengupta & Slater, 2010).

To make it simple, as someone once said, "Invention brings something new into BEING; Innovation brings something new into USE."

CREATIVITY

Speaking of innovation necessarily requires talking about creativity⁵. Although not synonymous, both concepts are inseparable (Duailibi & Simonsen Jr., 2005).

Creativity is part of the wider process of innovation. The main difference between both lies in the fact that innovation can be the result of the adaptation of something existing outside the organization, like Open innovation (Chesbrough, 2003), not implying a creative behavior. In any case, most innovations result from creative processes, individual and collective, spontaneous or intentional (Baxter, 2000; Ulrich & Eppinger, 2012). Creativity is based on reasoning that produces imaginative new ideas and new ways of looking at reality.

Innovation implies change, requires a combination of creativity, reasoning and ability to act (Tidd, Bessant & Pavitt, 2003).

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