

Collective Intelligence Value in the culture context: New Product Development and User Innovative Behavior

Abstract

This study aimed to investigate the impact of collective intelligence on new product development (NPD) and user inventive behavior in organizational settings. The Study decisions were made using the nomothetic approach, survey conducted among 60 product development managers from 10 organizations in the industry revealed that there is a positive relationship between innovative behavior and performance (both outcomes and efficiency). However, this relationship is mediated by the positive effect of collective intelligence within new product development projects. The study has three significant contributions. Firstly, it is the first of its type to examine the connections between creative behavior and performance. Secondly, it empirically and quantitatively investigates the function of bricolage in established organizations. Lastly, it provides information on the individual perspective of new product development processes. This study demonstrates the critical importance of inventive behavior and collective intelligence in enhancing performance within organizations during the creative processes of new product development (NPD). The findings underscore the significance of integrating the behavioral viewpoint with the resource-based viewpoint in the context of new product development (NPD), as well as the relevance of carefully choosing and effectively using the resources available to a firm.

Keywords: New Product Development, Idea Generation, Idea Facilitation, Innovative Behavior, Collective Intelligence

Introduction

According to Leonard-Barton (1992), a company's competitive advantages and profitability are fueled by new goods. Researchers in the field of new product creation have looked at a variety of factors, including human characteristics, levels of perceived creativity and identity, and organizational factors, competencies, culture, and routines (Gupta & Wilemon, 1990; Sivasubramaniam et al., 2012). Nevertheless, there has been little academic investigation into the mechanisms by which NPD-related behavior transfers into operational performance. Our comprehension of this fundamental creative process is clouded due to the lack of research that connects behavioral perspective with actions and performance. Prior studies (Brown & Eisenhardt, 1995) have brought attention to the amount of resources that can be used for product development. However, a lot of the process behind selecting and using resources to generate value is still mostly

unknown. Introducing novel goods and services to consumers is a certain way to grow a company's customer base and bottom line. Present marketing initiatives are predicated on the successful launch of new products (McCole, 2005; Hoffman, 2005). Due to increased competition, shorter product life cycles, and faster obsolescence, the rate of new product development (NPD) is more important than ever. As a result, companies can no longer afford to squander time if they want to continue growing. Companies that compete on the basis of development speed include Xerox, Gillette, and Honeywell. Companies can get an advantage over their competitors by being the first to market with innovative items. The firm's competitive start gives it advantages over rivals, which are projected to lead to a dominant position in the market (Fred and Erik 2009; Hoechst 2000). Companies require a plan for developing new products in today's economy, but they also need to understand what makes new products successful in the market, since technological advancements occur at a rapid pace and product life cycles are short (Roenrich, 2004). This study examines the process of developing new products, the steps involved in doing so, the signs that consumers exhibit innovative behavior, and the link between the two. Numerous studies have shown that innovations significantly impact company success (Albach, 1989; Wheelwright and Clark, 1992; Cooper, 2002). Despite their promising future as a competitive advantage, they have a very high market failure rate, particularly in the area of ground-breaking inventions (Crawford, 1997; Lüthje, 2007). Consequently, businesses are attempting to address the issue of user-acceptance by involving external actors, especially customers, in their innovation processes (Brem, 2008). By including users as issue solvers in different stages of the individual invention process, customer-centric innovations not only utilize the voice of the customer but also go beyond standard market research. This is where the lead-user strategy comes into play, targeting specific types of users (i.e., cutting-edge customers) who stand to gain a lot from cutting-edge ideas. Thus, new product development (NPD) relies on effective procedures and approaches to sustainably identify and incorporate consumers into the corporate innovation process. The term "web 2.0" encapsulates another modern megatrend: an effort to tap into the democratic capacities of Internet users. Nowadays, every form of search query may be answered with a simple web search. When it comes to effectively identifying lead users, however, there is a dearth of literature discussing the possibilities presented by new, highly personalized tools such as weblogs and communities. An endless resource—the knowledge that employees possess—forms the basis of knowledge management. It will take significant work to locate, gather, and direct the knowledge toward the

end product or service that will be given to the market; this capital must exist in its native form within the organization. Knowledge exploitation is challenging even for smart organizations. The intricacy of the motivational processes and the variety of knowledge govern this challenge. The term "knowledge management" refers to a set of procedures designed to make an organization's internal knowledge more organized and productive. A person needs to be able to draw parallels between new phenomena and things he is already familiar with. This is dependent on his IQ. Organizational strengths include the ability to foster the growth of collective intelligence by focusing team members' diverse networks on a shared goal. In order to coordinate efforts and resolve disagreements among teams, an intelligent organization's manager needs to learn to value the combined competency of his employees. Every individual has a unique set of skills. The reunification of individual competence and the acquisition of a set of competencies—a collective competency that surpasses the individual one—are prerequisites for integrating these persons into a team. The better quality of the collective acts that mobilize the competence of many individuals is due to the larger reflection framework. A group's collective intelligence is its combined ability to achieve its goals when its members work together as a team.

Review of literature

One definition of a new product concept is "a statement about anticipated product features (form or technology) that will yield selected benefits relative to other products or problem solutions already available" (Crawford and Benedetto, 2003). To paraphrase Belliveau et al. (2002), "a product (either a good or service) new to the firm marketing it" is what constitutes a new product. This does not apply to products that undergo changes just for campaigns. Products are considered new if they have been available for sale for five years or fewer and have undergone significant revisions and enhancements, as explained by Cooper (2001).

New product developments "Products that are recently introduced to the market either completely alter preexisting product categories or establish entirely new ones" (Crawford et al., 2003). Instructions are necessary for using these novel products, which may contain cutting-edge technology. These novel items constitute a whole novel market, according to Cooper (2001).

Items that have been around for a while but propel a company into a different market niche. Brands can break into new markets with the help of the "me-too" category, which is essentially a carbon copy of an existing product. It is possible for a product to be deemed novel even though it is

otherwise available in the market if a company delivers a nearly identical version to consumers. Cooper (2000) estimates that around 20% of all new goods fall into this group.

According to Kotler and Armstrong (2010), new product development refers to the process by which companies create their own products, enhance existing ones, change them, or launch new brands via their own research and development initiatives. According to Nikolaoes et al. (2004), a company can gain a strategic advantage by developing and releasing new goods that are responsive to customer feedback, have superior technical features, stay under budget, and beat the competition to market. In addition, many companies rely on new product development as their main source of revenue and as a means to achieve future growth. Improvements made with the buyer in mind have allowed it to mature over time. (Hoffman, et al., 2010; Fuchs, et al., 2010), Cooper (2009), the product's nature (Decker and Scholz, 2010), the channel (Lan, et al., 2007), the venue's nature (Fuller et al., 2009, Arakji and Lang, 2007), and the product's origin (Whyld, 2010). There is still a need for change, even when there is evidence of efforts at ongoing development. In a 2010 study, Szymigim et al.

Whether done alone or in a group, coming up with new ideas is a crucial part of being creative and, by extension, of being innovative. In order to generate ideas for new goods, the most inventive companies often use a variety of sources and methods to process those ideas. Also, in order to keep the pipeline that supports the creation of new products going, they need to inspire their employees' imaginations. In order to innovate and stay afloat in today's cutthroat business climate, organizations must possess strong creative capabilities. In 2006, Galanakis et al.

In a highly competitive market, developing new products is a crucial but risky strategy. (Clark et al., 2006; Cooper, 2001). Through developing new products, several corporations have become more competitive and made enormous profits. New product development (NPD) is complete without its effect on customer uptake and inventive behavior. One of the most effective ways for a company to grow and increase its earnings is to introduce new products and services to the market (Alves, et al. 2004a). Companies that consistently release innovative goods entice other social system members to follow suit (Roger 2003). Furthermore, the rate of product adoption and purchase by a social system's members can be understood through consumer innovative behavior.

Statement of Problem

In the rapid and competitive world of modern business, incorporating collective knowledge into cultural environments presents an exciting opportunity to enhance the effectiveness of new product development (NPD) and encourage user creativity. Although there is a growing recognition of the importance of shared knowledge as a valuable resource, there is still a lack of understanding about how cultural elements shape its use and impact on NPD procedures and outcomes. This research aims to explore the relationship between shared knowledge, cultural background, and their influence on idea generation, idea facilitation, innovative behaviour, NPD effectiveness, and NPD outcomes. Understanding these connections is crucial for businesses aiming to optimise NPD processes and effectively utilize user creativity.

Research Question

How does a blend of different cultural perspectives contribute to the generation of innovative concepts in the context of new product development (NPD)?

Research Objective

To explore the impact of collective intelligence on idea generation in various cultural contexts.

Research Methodology

This Study used the nomothetic approach to deployed the research and development departments of ten multinational corporations, polled 60 full-time workers who are managers and important decision-makers in new product development (NPD). They had research and development facilities in India, China and Saudi Arabia that produced goods for the hardware, networking, gaming, and telecommunications industries. Company mail was used to distribute questionnaires, and we received returned surveys in the same manner. A total of 60 surveys were received, have included NPD managers and decision-makers with a track record of successful product development in our final sample of 60.

Table 1 Reliability Analysis

Variables	No.of Items	Cronbach Alpha Value
Idea Generation	3	0.75
Idea Facilitation	3	0.80
Innovation Behaviour	3	0.78
New Product Development	3	0.86
NPD Efficiency	3	0.82

NPD Outcome	3	0.85
Collective Intelligence	3	0.88

From the above table 1 shows the evaluation in "Collective Intelligence Value in the Cultural Context: New Product Development and User Innovative Behavior" investigates into the credibility of different scales employed in gauging concepts linked to idea generation (0.75), idea facilitation(0.80), innovative behavior(0.78), new product development (NPD) (0.86), NPD efficiency (0.82), NPD outcome (0.85) and collective intelligence (0.88). The results shows that the cronbach's alpha values 0.75 to 0.88 indicating all the values have acceptable to continue the further research. Table 2 shows efficiency shows positive correlation with outcomes (0.552**), collective intelligence (0.341**) and culture context (0.221*). Efficiency outcomes are positive correlation between collective intelligence (0.451**), idea facilitation (0.332**), and culture context (0.261*). Collective intelligence positively correlated with the idea generation (0.451**), idea facilitation (0.381**), gender (0.229**), and culture context (0.212**). Idea generation is positively correlated with idea facilitation with (0.589**). Idea generation has a negative correlation with education (-0.32**). Idea facilitation is positively correlated with gender (0.312**). Idea facilitation has a negative correlation with education (-0.22**). Gender has a positive correlation with experience (0.227**) and culture context (0.02). Education has a negative correlation with (-0.46*) and culture context (-0.19). Experience positively correlated with culture context (0.19) and innovative behavior (0.221*). Innovative behavior has positive correlation with culture context (0.221*) and innovative behavior positive correlation with culture context (0.221*). Table 3 shows that collective intelligence is a mediator between ideation and facilitation processes and the efficiency and effectiveness of new product development. In a cultural setting, where there may be substantial differences in collective intelligence, these results take on further significance. Organizations can enhance the effectiveness of idea management in developing new products by fostering a culture that encourages and supports collaborative intelligence.

Table 2 Mean, Standard Deviation and Correlation												
Variable	Mean	SD	1	2	3	4	5	6	7	8	9	10
Efficiency	12.74	2.53	(0.51)									
Outcomes	33.58	4.57	0.552**	(0.81)								
Collective Intelligence	4.60	0.96	.341*	.451**	-0.71							
Idea Generation	5.54	0.54	0.12	0.221	.451**	-0.84						
Idea Facilitation	5.42	0.54	0.17	.332**	.381**	0.589**	-0.82					
Age	32.23	3.04	0.07	0.18	0.221	0.14	0.19					
Gender	0.44	0.37	0.11	0.11	.229**	.201*	0.11	.312*				
Education	0.89	0.89	0.00	-0.21**	-0.34**	-0.32*	-0.22*	-0.46*	-0.17*			
Experience	148.18	58.70	-0.02	0.01	0.1	0.12	0.11	0.887**	.227**	.421**		
Culture Context	53.83	39.57	0.221*	.261*	.212**	0.04	-0.02	0.03	0.02	0.19	0.02	
Innovative Behavior	22.92	17.99	0.03	0.06	-0.01	-0.15	-0.15	-0.15	0.12	0.201*	0.10	.221*

Table 3 Products of Coefficient test on Indirect effects through collective intelligence				
Mediator	Independent Variable	Dependent Variable	Mediated Effect	P
Collective Intelligence	IG	NPD Outcomes	0.15*	0.03
		NPD Efficiency	0.12*	0.04
	IF	NPD Outcomes	0.07*	0.05
		NPD Efficiency	0.06*	0.02

Table 4 ANOVA Test New Product Development and Collective Intelligence Culture

Scale	Control Group			Experimental Group			P Value
	N	Mean	SD	N	Mean	SD	
Color	60	4.21	1.762	60	4.08	1.324	.014
Shape		5.42	2.781		4.23	2.112	.039
Size		4.23	2.578		3.81	1.723	.002

Table 4 indicates that Color, shape, and size perceptions seem to be impacted by the experimental manipulations pertaining to collective intelligence. These results provide more evidence that cultural circumstances involving collective intelligence can influence sensory and perceptual experiences that are important for product development and user behavior. Companies can improve their new product development (NPD) strategies by learning how collective intelligence impacts perception in various cultural settings. This will help them create goods that cater to the complex tastes and expectations of different markets.

Conclusion

This study is the initial endeavor to investigate the impact of creative behaviors in firms on actions and performance. Our study revealed that engaging in bricolage acts facilitates inventive behavior, which in turn enhances performance in new product development (NPD) within businesses. These findings hold true even after accounting for factors such as age, gender, educational background, work experience, organizational tenure, and NPD tenure within the respondent's current firm. Specifically, we integrated two prominent theoretical viewpoints (behavioral and improvisation perspective) to investigate the process of new product development (NPD) and the factors that influence NPD performance.

The facts and conclusions in this research unequivocally question the underlying assumptions of the efficiency perspective in literature, which posits that structuring, routines, and standardized processes are the most effective methods of functioning in firms. Our study unequivocally

demonstrates that in situations involving Narcissistic Personality Disorder (NPD), innovative cognitive and operational approaches enhance both efficiency and results. Nevertheless, there has been no prior research that expands into the realm of NPD and innovation. This study is the first endeavor to examine innovative behaviors and collective intelligence acts within the product development processes of well-established companies. In addition, there is a scarcity of quantitative studies in this particular sector. This study additionally delves into and presents arguments regarding the many aspects of inventive behavior. Our findings demonstrated the varying degrees of influence that idea generation behavior and concept facilitation had on NPD performance, considering its multi-dimensional nature. It is evident that the influence of idea generating activity is slightly more pronounced than that of idea facilitation behavior. There is a need for additional empirical research to investigate the processes and performance of new product development in order to have a comprehensive grasp of the field. The scholarship should incorporate additional quantitative evidence and comprehensive qualitative research to emphasize the elements that contribute to both success and failure in new product development (NPD). The NPD area's link has a direct impact on our comprehension of innovations within organizations.

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