

Collective Intelligence Value in the Culture Context: New Product Development and User Innovative Behavior

Tahir Nisar^{1*}, Guru Prabhakar², Dina S. AL-Ghamdi³, Ayman Sherbini⁴

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 [1]. 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) [2]. 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 number of resources that can be used for product development [3]. 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) [4]. 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,

* Author for Correspondence
Tahir Nisar
E-mail: t.m.nisar@soton.ac.uk

¹Professor, of Strategy and Economic Organization and Behavior, Southampton

²Professor Business and law School- University of the west of England -UK.

³Assistant Professor, Applied College - Taibah University- Saudi Arabia.

⁴Faculty of Business administration, Taibah University, Saudi Arabia

Received Date: May 20, 2024

Accepted Date: June 28, 2024

Published Date: July 08, 2024

Citation: Tahir Nisar, Guru Prabhakar, Dina S. AL-Ghamdi, Ayman Sherbini. Collective Intelligence Value in the Culture Context: New Product Development and User Innovative Behavior NOLEGEIN Journal of Consumer Behaviors & Market Research. 2024; 7(2): 1–7p.

companies can no longer afford to squander time if they want to continue growing. Companies that compete because of development speed include Xerox, Gillette, and Honeywell. Companies can get an advantage over their competitors by being the first to market 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) [5]. 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. 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) [6,7]. Despite their promising future as a competitive advantage, they have a very high market failure rate, particularly in the area of ground-breaking inventions [8]. Consequently, businesses are attempting to address the issue of user-acceptance by involving external actors, especially customers, in their innovation processes. 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 can 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 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. 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. 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 [9]. 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.

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

Items that have been around for a while 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.

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. 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 to achieve future growth. Improvements made with the buyer in mind have allowed it to mature over time. (Hoffman, et al., 2010), Cooper (2009) [10,11], the product's nature (Decker and Scholz, 2010) [12]. the venue's nature (Fuller et al., 2009) [13].and the product's origin. There is still a need for change, even when there is evidence of efforts at ongoing development.

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, to keep the pipeline that supports the creation of new products going, they need to inspire their employees' imaginations. To innovate and stay afloat in today's cutthroat business climate, organizations must possess strong creative capabilities. In 2006, Galanakis et al [14].

In a highly competitive market, developing new products is a crucial but risky strategy. (Clark et al., 2006) [15]. 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) [16]. Companies that consistently release innovative goods entice other social system members to follow suit [17]. Furthermore, the rate of product adoption and purchase by a social system's members can be understood through consumer innovative behavior [18].

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 behavior, NPD effectiveness, and NPD outcomes. Understanding these connections is crucial for businesses aiming to optimize NPD processes and effectively utilize user creativity [19].

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 employed a nomothetic approach to examine the research and development (R&D) departments of ten multinational corporations. We polled 60 full-time workers who are managers and

key decision makers in new product development (NPD). These corporations had R&D facilities in India, China, and Saudi Arabia, producing goods for the hardware, networking, gaming, and telecommunications industries. Questionnaires were distributed via company mail, and completed surveys were returned in the same manner. We received a total of 60 completed surveys, which included responses from NPD managers and decision-makers with a proven track record of successful product development.

Variables	No. of Items	Cronbach Alpha Value
Idea Generation	3	0.75
Idea Facilitation	3	0.80
Innovation Behavior	3	0.78
New Product Development	3	0.86
NPD Efficiency	3	0.82
NPD Outcome	3	0.85
Collective Intelligence	3	0.88

Table 1. Reliability Analysis.

Table 1 presents the evaluation from "Collective Intelligence Value in the Cultural Context: New Product Development and User Innovative Behaviour." This study investigates the credibility of different scales used to measure concepts related to idea generation (0.75), idea facilitation (0.80), innovative behaviour (0.78), new product development (NPD) (0.86), NPD efficiency (0.82), NPD outcome (0.85), and collective intelligence (0.88). The Cronbach's alpha values range from 0.75 to 0.88, indicating that all values are acceptable for further research.

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 2. Mean, Standard Deviation and Correlation.

Table 2 reveals that NPD efficiency has a positive correlation with outcomes (0.552**), collective intelligence (0.341**), and cultural context (0.221*). Positive correlations are also observed between NPD outcomes and collective intelligence (0.451**), idea facilitation (0.332**), and cultural context

(0.261*). Collective intelligence shows positive correlations with idea generation (0.451**), idea facilitation (0.381**), gender (0.229**), and cultural context (0.212**). Idea generation is positively correlated with idea facilitation (0.589**), but negatively correlated with education (-0.32**). Idea facilitation is positively correlated with gender (0.312**) and negatively correlated with education (-0.22**). Gender is positively correlated with experience (0.227**) and cultural context (0.02). Education shows a negative correlation with cultural context (-0.19). Experience is positively correlated with cultural context (0.19) and innovative behaviour (0.221*). Innovative behavior has a positive correlation with cultural context (0.221*).

Table 3 demonstrates that collective intelligence mediates the relationship between ideation and facilitation processes, and the efficiency and effectiveness of new product development. In cultural settings where there may be significant differences in collective intelligence, these results become particularly important. Organizations can enhance the effectiveness of idea management in developing new products by fostering a culture that encourages and supports collaborative 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 3. Products of Coefficient test on Indirect effects through collective intelligence.

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. ANOVA Test New Product Development and Collective Intelligence Culture.

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

CONCLUSION

This study represents an initial effort to investigate the impact of creative behaviors in firms on actions and performance. Our research reveals that engaging in bricolage 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—the behavioral and improvisation perspectives—to investigate the process of NPD and the factors that influence NPD performance. The facts and

conclusions of this research challenge the underlying assumptions of the efficiency perspective in the literature, which posits that structuring, routines, and standardized processes are the most effective methods of functioning in firms. Our study demonstrates that in situations involving new product development, 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 to examine innovative behaviors and collective intelligence acts within the product development processes of well-established companies. Additionally, there is a scarcity of quantitative studies in this sector. This study delves into and presents arguments regarding the various aspects of inventive behavior. Our findings show the varying degrees of influence that idea generation behavior and concept facilitation have 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 to achieve a comprehensive understanding of the field. Future scholarships should incorporate more quantitative evidence and comprehensive qualitative research to emphasize the elements that contribute to both success and failure in new product development. Understanding the link between these factors and NPD has a direct impact on our comprehension of innovation within organizations.

REFERENCES

1. Leonard-Barton, D. 1992. Core Capabilities and Core Rigidities: A Paradox in Managing New Product Development. *Strategic Management Journal*, 13: 111-125.
2. Gupta, A. K., Wilemon, D. L. 1990. Accelerating the development of technology-based new products. *California Management Review*, 32(2): 24-44.
3. Brown, S. L., Eisenhardt, K. M. 1995. Past Research, Present Findings, and Future Directions, *Academy of Management Review*, 20(2): 343-378.
4. McCole, P., and Ramsey, E. (2005) "A Profile of Adopters and Non- Adopters of Ecommerce in SME Professional Service Firms": *Australian Marketing Journal*, vol. 13, Pp 36-45.
5. Fred, Langerak and Erik J. Hultink (2009) "The Impact of Product Innovativeness on the link between Development Speed and New Product Profitability" *Journal of Organizational Science* vol. 3, No. 3 Pp 321-41
6. Albach, H (1989). Innovationsstrategien zur Verbesserung der Wettbewerbsfähigkeit. *Zeitschrift für Betriebswirtschaft*, 59(12), 1338-1352
7. Cooper R.G. (2001). *Winning at New Products* (3rd edition). New York: Addison Wesley P. 8, P. 14-15, Pp 130-141.
8. Di Benedetto CA, DeSarbo WS, Song M. Strategic capabilities and radical innovation: an empirical study in three countries. *IEEE Transactions on Engineering Management*. 2008 May 28;55(3):420-33.
9. Belliveau, P. Griffin, A and Somermeyer, S. (2002). *The PDMA Tool Book for New Product Development*. New York: Product Development and Management Association Pp. 450.
10. Hoffman DL, Kopalle PK, Novak TP. The "right" consumers for better concepts: Identifying consumers high in emergent nature to develop new product concepts. *Journal of Marketing Research*. 2010 Oct;47(5):854-65.
11. Cooper, R.G. (2009), "Effective Gating: make Product Innovation more Productive by using Gates with Teeth", *Marketing Management Magazine*, March/April, Pp. 12-17
12. Decker, R. and Scholz, S.W. (2010), "Determining the Attractiveness of Product Attributes in Consumer Goods Market using POS Scanner Data", *Marketing Review*, Vol. 10 No. 3, Pp. 225-37
13. Fuller, J. (2010), "Refining virtual co-creation from a consumer perspective", *California Management Review*, Vol. 52 No.5 Pp. 98-122.
14. Galanakis K, Passey S, Yazdani B. A management tool for innovation using systems thinking approach. In *Proceedings of the 2000 IEEE International Conference on Management of Innovation and Technology. ICMIT 2000. Management in the 21st Century*(Cat. No. 00EX457) 2000 Nov 12 (Vol. 1, pp. 378-383). IEEE.

15. Clark RA, Goldsmith RE. Interpersonal influence and consumer innovativeness. *International Journal of Consumer Studies*. 2006 Jan;30(1):34-43.
16. Alves, J. Marques, M. J. Saur, (2004a): "Role of Networking in Innovation promotion and cluster
17. Rogers EM, Singhal A, Quinlan MM. Diffusion of innovations. In *An integrated approach to communication theory and research* 2014 Apr 8 (pp. 432-448). Routledge.
18. Szymigim, I.T.D and Bourine, H. (2010) "Electronic cash. A qualitative Assessment of its Adoption", *International Journal of Bank Marketing*, Vol. 17 No. 4 pp 192-203.
19. Wyld DC. Speaking up for customers: can sales professionals spark product innovation?. *Academy of Management Perspectives*. 2010 May;24(2):80-2.