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Proceedings of International Conference on Strategies in Volatile and Uncertain Environment for Emerging Markets
July 14-15, 2017
Indian Institute of Technology Delhi, New Delhi
pp. 60-67

Disruptive Innovation Manifestation and Disruptive Innovation Capability

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Abstract

We examine the manifestation of disruptive innovation (DI) derived from a firm's capability for DI. We focus on the scarcity of academic research into the phenomenon of disruptive innovation capability (DIC), in emerging economies by setting this study in India. We develop a model using extant literature and multiple case studies, with a cross case qualitative research design. The Indian auto sector is utilized because of its greater readiness for innovation, making it a representative context within emerging economies. Our approach allows us to create a model of disruptive innovation manifestation (DIM) and subsequently derive a set of research insights. These insights highlight the constructs that contribute towards building a theoretical framework of DI in emerging economies. We find and emphasize the importance of strategic leadership and the customer insight process for DIM in an emerging economy setting as additional constructs, not initially theorized.

Keywords: Automotive Sector, Case Studies, Disruptive Innovation, Dynamic Capability, Emerging Economies.

1. Introduction

Govindarajan and Kopalle (2006) suggest that Disruptive Innovation (DI) allows organizations to focus on changing or introducing new features, performance and price attributes through the process of innovation. DI provides a means for developing new markets and providing an organization with new functionality, which may in turn provide opportunities to disrupt existing market links (Yu and Hang, 2008). We examine how DI manifestation relates to disruptive innovation capability (DIC) at firm level. We focus on the dynamic capability-based view (DCV) (Teece *et al*., 1997) because (DCV) adds a fresh perspective in examining perspectives on DI. Specifically, our study is driven by Corsi and Di Minin (2014) who suggest that research in western world cannot be directly transplanted to emerging economies. Thus, we focus on Disruptive Innovation Manifestation (DIM) rather than DI and as such DIM is considered as a subset of DI. This is primarily because in emerging economies the instances of DI have been hardly measurable. Actual introduction of an innovation into the market is denoted by DIM; it should not be confused with the representation of an idea within the organizational boundary.

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2. Theoretical Foundation

According to Schmidt and Druehl (2008), firms can identify the direction of diffusion to assess, and evaluate the implications of DI. The DI success factors may be classified into a) market related; b) technology related; and, c) other favorable factors (Hang *et al*., 2011). We argue that the DI success needs to be linked to the DIC concept as suggested by Assink (2006), his approach explores how the organizational innovation capability can be used for DI. Dynamic capabilities appear to be a multidimensional construct that includes capabilities such as sensing, learning, integrating, and reconfiguring inclusive coordination, (Pavlou and El Sawy, 2011). Assink (2006) argues that while disruptive innovation may be a challenging topic, it can be understood when we focus on the organizational capabilities and particularly based on dynamic capability. Organizational capabilities (at times dynamic capabilities), have been linked to organizational innovation by several researchers (Breznik and Hisrich, 2014; Joshi *et al*., 2015).

The literature does not address the impact of external environment on the firm-level manifestation of DIM. The context and environment for our research is critical because our data is drawn from the auto sector in India, an emerging economy where context matters (Corsi and Di Minin, 2014). We argue that environmental turbulence is critical when studying organizational outcomes such as innovation or firm performance. While conducting a qualitative research, we extrapolate and apply the findings form quantitative studies and argue that in turbulent environments, organizations face a variety of challenges and threats, wherein a firm's ability to leverage its capabilities to improve existing processes or create new processes or a new product or service can play a key role in obtaining better organizational outcomes, including innovation. In essence, hostile environments encourage firms to use its capabilities to improve the level of innovation (Das and Joshi, 2012).

3. Methodology

This study uses multiple cases focusing on sequential case studies and a within- and cross-case analysis to examine the research question(s). Recursive cycling between theorization, case data, emerging theory, and later, extant literature defines the theory-building process. The unit of analysis for this research was at the level of strategic business unit in the Indian auto sector, an attractive industry choice due to its continued product and process innovation and high growth potential. The lead author used several hours of interviews involving over a dozen top-level executives from the three organizations studied. Triangulation was done across primary and secondary data. In addition the lead authors' observations and interactions during the visit to the sites, were also used for making inferences. This complemented the interview data and secondary sources (annual reports, press releases, newspaper articles, information on the Internet, and published case studies). As such, our inferences are based on a wider net of data collections, beyond only the interviews of respondent firms. The researcher visited six cities across India to collect primary data. The recorded interviews were transcribed and amalgamated with the secondary data to prepare case history for each firm (Miles and Huberman, 1994).

Case Study Database 1 (CSB1) contained the first level of coding emerging from the transcripts, observations, and secondary data. Subsequently coded data from CSB1 was referenced to create the Case Study Database 2 (CSB2) for all three cases. This step allowed us to achieve the de-contextualization of the codes. Further refinements and abstractions resulted in the construct development towards theory building. According to handbook of qualitative research (Sage, 2010), the process of construct evolution follows the concept of abduction. Locke (2007) highlighted this creative and inventive dimension of theorizing. He did so by making connections from the data, generating ideas, images, and associations that threw up possibilities to work with and take forward in research. A within-case analysis was conducted for all the cases as

stated above. The codes generated in each case are as follows: National Motors (L1 = 113, L2 = 60, L3 = 28); Eco Green (L1 = 139, L2 = 50, L3 = 30); Global Corp (L1 = 143, L2 = 83, L3 = 46). For each case, the Level 3 codes led to the discovery of additional constructs that if found pertinent to our research question were then incorporated into the model. We also conducted a cross-case analysis based on the constructs appearing across the cases (Eisenhardt, 1989) to identify the patterns that were replicated across the cases.

4. Findings

We observed the constructs similar to those that were expected from the theoretical framework section, namely Disruptive Innovation Manifestation (DIM), Disruptive Innovation Capability (DIC) and environmental turbulence. Since the participating firms preferred anonymity, names of the firms, their divisions, and the product have been disguised in this description. While examining the data and codes form the interviews, we focused on the idea of DIC as a multi-dimensional construct (Assink, 2006) and therefore we looked for the four sub-dimensions of DC: sensing; learning; integration; and, reconfiguration capabilities (Pavlou and El Sawy, 2011). Also additional constructs that were not theorized but emerged are: operational capabilities, strategic leadership, new product development and customer insight. These constructs add critical dimensions to our understanding of the relationship between DIM and DIC in the context of the research.

Table 1: Case A: National Motors Limited - The Leo Case

National Motors Limited (NML), formed in 2004, is a subsidiary of a large automotive firm (a family-run enterprise) in the farm equipment (tractor) sector in India. Leo, focused on higher engine rating, mileage, and more cabin space. Leo was targeting the market vacated by Qualis (Toyota), which operated primarily in the segment consisting of taxi or rental vehicles. The DIC seemed well developed at the company in terms of the sensing dimension. The learning dimension of DIC is also exhibited with the evidence of improvement process that took place on Leo from 2008 to 2012. However, on the Integration & Reconfiguration dimension, the evidence was almost not present. Leadership, Organizational Culture, Organization Structure, and Human Resource Management were identified as additional constructs. New Product Development (NPD) process and Operational Capabilities were additional constructs that were well formed. NPD was the connecting link between DIC & DIM (Disruptive Innovation Manifestation). Among operational capabilities both marketing and technology capabilities were discovered. The DIC seem to act on the weaker operational capabilities like R&D/technology. The presence of Environmental turbulence was detected both from a market and technology perspective, with its influence evident in the improvement process that led to a technical overhaul of the vehicle post-launch in 2006, and the inability of the re-launched vehicle to make a dent in the market in 2012 due to market evolution.

To summarize,

1. The capability for DI appeared to be well developed on the dimensions of sensing and learning. However, it seemed relatively weaker on integration and practically non-existent on reconfiguration dimension;
2. In the internal environment organizational culture, leadership and structure were discovered as primary factors influencing the capability for DI;
3. The DIC acted on the weaker functional capabilities (R&D/technology) strengthening them and
4. Environmental turbulence was detected in the case.

Table 2: Case B: Eco Green Private Limited – The Mars Case

Eco Green Private Limited (EGPL) was formed in 1999. The firm operated in the electric vehicle space. It was acquired by Global Vehicle Corporation in 2010. The SBU has a single product – an electric passenger vehicle targeting the passenger car segment. The product underwent three revisions since launched in 2001. The third generation of the product was launched in 2013 under the model name Mars. After the initial launch in 2001 the parent company realized that the domestic market had not evolved to accept a battery-operated vehicle. Having reinforced their capabilities through an acquisition by Global Vehicle Corporation, EGPL launched the third generation of Mars in 2013. A vehicle with battery power and network capabilities represented an alternate fuel option to consumers whose primary concerns were fuel economy and convenience as key determinants in the mainstream segment. Mars targeted the second car market in the major metropolitan areas and appealed to green concerns of the urbanized consumer. The assessment of Eco Green's DIC suggests that the sensing and learning dimensions seems well developed. Sensing was evidenced in its assessment of the market in India after EGPLs initial launch in 2001, and the decision to launch the vehicle in Europe. Both learning and sensing were again manifested with the evolution of technology. The integration dimension seems better developed in the Mars case as compared to the NML (Leo) case. Re-configuration is demonstrated through a partnership between Eco Green and Global Vehicle Corp. R&D capability is seen as a part of the top management team and there is evidence of technology leadership. The NPD process seems more developed relative to the Leo case and the company capitalized on its Operational capabilities for DIC in terms of marketing and manufacturing (instead of technology, as in the earlier case). Environmental turbulence was an influential construct due to unpredictable policy framework. This was, further, accentuated because of deviation from mainstream technology and a dependency on supportive policies.

The key findings from this case were:

1. Sensing, learning and the integration aspect seemed to be developed as a part of DIC;
2. R&D capability is seen as a part of senior leadership;
3. Operational capabilities are marketing & manufacturing;
4. Emphasis on Policy as a major environmental variable and
5. Reconfiguration dimension evidence with tie up with Global Vehicle Corporation.

Table 3: Case C: Global Vehicle Corporation – The Panther SUV Case

Global Vehicle Corporation (GVC) is a large global multi-business conglomerate operating for over sixty years and holds considerable influence over the utility vehicle market in India. The product investigated was a sports utility vehicle launched in a new market segment and an emergent niche was evidenced in the case. The SUV (Sports Utility Vehicle) offered new functionality by way of sophisticated power, while the key performance in the mainstream acceptable to the consumer was rugged, crude power. Because our research is focused at the Strategic Business Unit (SBU) level, the Panther case is an independent case compared to the Mars case (Case B- Table 2). The vehicle targeted the upscale segment of the market where utility vehicles so far had not ventured and high-end sedans held sway. The DIC is fully developed in all aspects, and the sensing dimension seems to have evolved to a new level with a unique Customer Insight Process. The learning and integration dimensions are fully exhibited with acquisitions and patents, as well as a product to platform transformation with global benchmarks. There is evidence of a reconfiguration with a string of NPD launches and a matrix organization structure. There was also evidence that the firm introduced other disruptive products. This demonstrates the recursive nature of the relationship between DIM and DIC, with its impact on the NPD Process creating a virtuous cycle. The impact of strategic leadership is shown through the firm's stated policy of continuous growth through new product launches and acquisitions.

The key findings from this case were:

1. Customer insight was discovered as a key component of sensing dimension;
2. Strong learning, integration and reconfiguration dimensions with impact on Operational capabilities, NPD process and Matrix structure;
3. A well-developed NPD process with a string of launches and the recursive nature of the relationship between DIM & DIC and;

d. The pervasive impact of strategic leadership with the strategic intent.

5. Discussion and Contributions

We discovered several additional constructs, as described in the foregoing section. Out of these constructs, four additional ones were deemed necessary to enhance our understanding of the relationship between DIC and DIM and were incorporated into the theoretical model. These are New Product Development (NPD); Strategic Leadership; Customer Insight; Operational Capabilities.

Research Implications: DIM

DIM shows a weak, intermediate, and strong influence for National Motors, Eco Green, and Global Vehicle Corp Case, respectively. The lack of adequate technical capability at the firm level explains the weak DIM at National Motors. Eco Green demonstrated an intermediate level as it had inadequate Operational capability in marketing and manufacturing, whereas DIM was strong at Global Vehicle Corp. However, the evidence presented showed a change in intensity of DIM at GVC within eighteen to twenty four months of launch due to environmental turbulence. Environmental turbulence is clearly influential. The capability gaps as well as the extent of DIC development at the firm level played a role on the intensity of DIM, *implying that the disruption may be temporary or short-term instead of long-term or permanent, and therefore the intensity of DIC on DIM is influenced by firm capabilities and environmental turbulence*. Additionally, the observation that Leo's launch was inspired by Qualis vacating the market and the subsequent successes of the Renault Duster and Ford Eco Sport in India implies that *innovations adapted to emerging economies from more developed economies may be acceptable as DI in the emerging economies* (Corsi and Di Minin, 2014). This is independent of the fact whether they were considered DI in the original market (developed economy) or not. These inferences, lead to the following:

a. Innovations in technologically advanced countries can manifest as DI in emerging economies.
b. When an existing business is transformed, the intensity of the disruption's manifestation would be diminished.
c. DI in emerging economies disrupts mainstream market linkages by redefining customer value (features, performance, price attributes, or combination thereof).

Research Implications: DIC

Sensing and learning abilities existed in all the cases as seen from DIC comparison although the intensity of both sensing and learning varied. The *identification of a disruptive project needed a well-developed customer insight capability; this was present in GVC case (project– Panther).* This case showed the most well developed customer insight process; the three cases revealed

that GVC had highest level of DIM. Based on the findings, it is proposed that customer insight should be included in sensing dimension of DC for DI manifestation**.** Our research revealed that integration dimension existed only at Eco Green (Mars) and Global Corp (Panther) while the reconfiguration dimension was adequately represented in GVC only. Further, the reconfiguration dimension was observed to be critical for DIM among the four sub constructs of DIC. All these three cases showed attempts at reconfiguration with varied results, the ability to reconfigure functional capabilities was consistently present only in GVC. *Thus, we derive that DI capability without an adequate reconfiguration dimension may not be able to effectively manifest DI*. This implies that there is a hierarchy in the four dimensions of DIC: sensing (with customer insight), learning, integrating, and reconfiguring.

The commitment of the promoters and the decision making executives to such innovative projects was a crucial for DIC. Hence, we propose the inclusion of strategic leadership as an additional dimension of DIC. Based on these inferences, we propose the following:

a. Customer insight capability is a necessary condition for firms to attempt DIM.

b. There is hierarchical relation among the DIC sub-constructs; the reconfiguration dimension being at the highest level and is a must to manifest DI.

c. Strategic Leadership is a necessary catalyst for DIM.

Research Implications: Environmental Turbulence (ET)

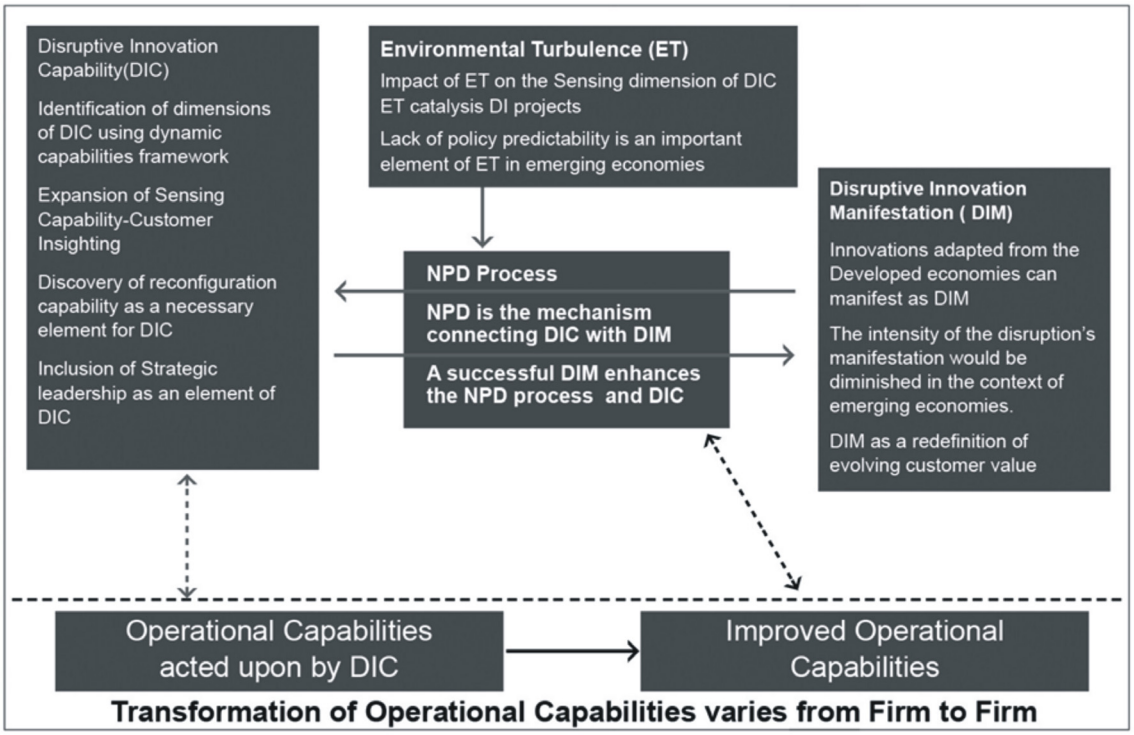
External factors clearly influence the sensing aspect in all three cases. Leo was created because Toyota (Qualis) exited the taxi (and rental car) segment. It was clear that the opportunity for these projects arose because of uncertainty in the environment that might have been induced either from a market, technological, or policy perspective. Hence, *ET provides more opportunities for such projects, enhancing the DIC to DIM links* as suggested by Das and Joshi (2012). Eco Green case clearly revealed the technology dimension as electric vehicles, which has zero emissions, emphasized the customer insight. These lead to the following research insights:

a. ET helps in identifying disruptive opportunities, enhancing DIC-DIM linkages.

b. Lack of policy predictability is an important element of ET in the context of emerging economies.

6. Conclusion, Limitations and Further Research

Our conclusions by way of propositions have been captured as research insights. Our approach, case analysis and insights become significant contribution to DI literature considering that the bulk of the studies on DI are carried out in developed nations. Due to the lack of DI studies in the emerging economies, at times policy planners from emerging economies consider input from conclusions obtained from studies focused on developed economies (Radas and Bozic, 2009), though these findings may not apply to emerging economies (Najib and Kiminami, 2011). Our study would allow such gaps to be overcome (albeit with some caveats). The research process from the case method to conclusion is summarized in the Figure 1 below:



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