

The Determinants to Foster Innovation Performance from a Sustainable Development Perspective

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Abstract

The benefits of sustainability-driven innovation and its impacts on performance under the three dimensions of economic, social, and environmental performance have often not been adequately captured. This article acknowledges this gap and presents a conceptual framework that helps identify the determinants to foster innovation performance, and explains the relationship with sustainability practices through the exploitation of existing competencies, and exploration of new opportunities from a sustainable development perspective. This was assessed based on their eventual impact on innovation performance, with the theoretical underpinnings of the dynamic capabilities theory. This approach could be beneficial for both the private and the public sectors towards taking a holistic view to realize the goals of sustainable development.

Keywords: Exploration, exploitation, sustainable innovation, sustainability practices, innovation performance, sustainable development, sustainability gap

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ปัจจัยกำหนดการคงอยู่ของนวัตกรรมองค์กร: จากมุมมองของการพัฒนาอย่างยั่งยืน

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บทคัดย่อ

ภาพของปัจจัยขับเคลื่อนนวัตกรรมอย่างยั่งยืน และผลกระทบของเรื่องนี้ต่อนวัตกรรมองค์กรภายใต้มิติทางเศรษฐกิจ สังคม และสิ่งแวดล้อม ในปัจจุบันยังไม่ชัดเจนเพียงพอ บทความนี้ตระหนักถึงช่องว่างดังกล่าว จึงได้นำเสนอกรอบแนวคิดซึ่งช่วยระบุถึงปัจจัยกำหนดการคงอยู่ของนวัตกรรมในองค์กร และอธิบายความสัมพันธ์ระหว่างปัจจัยต่าง ๆ ผ่านการใช้ประโยชน์จากสมรรถนะที่มีอยู่และการแสวงหาโอกาสใหม่ ๆ จากมุมมองการพัฒนาที่ยั่งยืน การวิเคราะห์อยู่บนพื้นฐานของผลกระทบต่อนวัตกรรมองค์กรโดยอาศัยทฤษฎีเกี่ยวกับสมรรถนะเชิงพลวัต (dynamic capabilities theory) ผลการศึกษาครั้งนี้จะเป็นประโยชน์ต่อทั้งภาครัฐและภาคเอกชนเกี่ยวกับมุมมององค์รวมของการพัฒนาที่ยั่งยืนต่อไป

คำสำคัญ: การวิจัยเชิงสำรวจ การใช้ประโยชน์ นวัตกรรมที่ยั่งยืน การดำเนินงานที่ยั่งยืน นวัตกรรมองค์กร การพัฒนาที่ยั่งยืน ช่องว่างความยั่งยืน

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Introduction

Innovation is the key to enhancing competitiveness and economic prosperity, for building the competitive edge that is crucial in the globalized world of today. This requires a shift from the traditional short-term approach of profit orientation to a more holistic approach, that appropriately balances the social, environmental, and economic challenges for ongoing and future generations. For a society to achieve sustainable development, it has to do so with corporate support, namely from the private sector, which is an important driving force of the economy (Bansal, 2002).

The effective handling of environmental concerns, by promoting innovative green products and supported through regulations, has become an essential prerequisite for their ecological efficiency. Local efforts to drive environmentalism and economic growth are not mutually exclusive; rather, they are complementary to innovation capabilities. This provides businesses with the impetus to reduce development costs by integrating environmental protection and energy conservation measures into their investments. This revolutionary change of approach calls for organizations to be ambidextrous: with “exploitation” to go beyond current knowledge and enable greater reliability and effectiveness; and “exploration” which enables new knowledge to be enhanced and flexible (Atuahene-Gima, 2005; O’Reilly & Tushman, 2004). In other words, ambidexterity could be considered the concurrent approach of exploration and exploitation, which has been hypothesized to improve organizational capability for better performance (Rothaermel & Alexandre, 2009; Lin et al., 2007; He & Wong, 2004). In an environment where organizations face pressure from increasing rates of change, the need to innovate helps them to remain competitive.

Innovation is crucial to the organization’s competitive advantage, which is the driving force behind organizational performance (Dutta et al., 2005; Geroski et al., 1993). Our research takes the sustainable development agenda from a sustainability dimension, considered as the crucial business factor by a firm’s stakeholders, comprising customers, shareholders, policymakers, and the representative communities (Sheth et al., 2011; Epstein & Roy, 2003).

The sustainability agenda also has a bearing on the wider societal good (Crittendon et al., 2011). In recent times, sustainable development has become a focus in business, and the issue of sustainability has hindered the organization’s capability to create value. The need to address sustainability led many researchers to call for a “dynamic and sustainable” view of the firm. Our research looks to bridge the sustainability gap, and, based on the dynamic capabilities perspective, aims to establish an empirical link between sustainability

practices and innovation performance as assessed by their impact on the triple bottom line.

Our research aimed to answer the following questions:

- What are the determinants that foster innovation performance from a sustainable development perspective?
- Are exploration and exploitation positively affected by the stakeholders' sustainability orientation, market orientation, and organizations' internal trust?
- Does the pursuit of sustainability practices through exploration and exploitation positively impact a firm's performance on the triple bottom line?

The Theoretical Basis

The resource-based view of the firm suggests that the basis for competitive advantage inherently lies in the firm's resources and in the way an organization "structures, bundles, and leverages those resources" (Connelly et al., 2011). Organizations recognize the growing prominence of sustainability as a strategic differentiator to make them stand out in today's dynamic and competitive market environment. The authors of the DCT theory (Teece et al., 1997) were influenced by the works of Prahalad and Hamel (1990). The theory takes its roots from the "Resource Based View," which provides competitiveness in the way a firm utilizes its resources and structures to its advantage (Connelly et al., 2011). This view defines sustainability through the practices which provide the much-needed competitive advantage, strengthened with the dynamic capabilities required in a fast-changing environment, and is a perfect fit for this research.

Our research is guided by concepts of market orientation and organizational learning, through sustainability practice processes of exploitation and exploration. DCT emphasizes the impact of exploitation on internal and external competencies specific to the organization, that help adapt and react to dynamic changes in the environment (Teece et al., 1997). The definition was modified to define the organization's capabilities as strategic routines through which the organization establishes new resource configurations in dynamic environments. Dynamic capabilities are antecedents of organizational and strategic routines (Eisenhardt & Martin, 2000), and are based on how managers re-work their resources, obtain and put away resources, and amalgamate and recombine them to create strategies to generate new value. Teece et al. used the term "dynamic" to refer to changing situations in technology and market forces, and to ensuring "feedback effects" on the firm.

Our research argues for firms to achieve competitive advantage through sustainable development, which has become a necessity and not an option. This requires that organizational capabilities and their efficiencies—which are unique to each organization—be aligned with the organization’s resource base. The resource-based view defined sustainability through practices that provided much-needed competitive advantage, taking the competence perspective. DCT further strengthens the view by considering the dynamic capabilities required in a changing environment and marketplace.

Eisenhardt and Martin (2000) noted that the resource-based view was not effective and that the difference between the dynamic capabilities framework and the resource-based view approach lay in the emphasis of the two core elements: the “dynamic” element that indicates the capacity to regenerate competencies aligned to the changing environment; and “capabilities” which outlines the strategies’ role in the adequate integration, adaptation, and reconfiguration of both elements in the high-velocity markets with their dynamic environments.

Maintaining strategic advantage is the key and often a challenge in unpredictable times. Time, therefore, is a crucial component of strategy and dynamic capabilities, which directs the competitive advantage born of processes that are themselves challenged to be sustained. Sustainability is the crucial goal of organizations (Closs et al., 2011) through their strategies and dynamic capabilities that directs the competitive advantage.

The sustainability context is approached through constructs of sustainability practices, namely Sustainability Exploitation and Sustainability exploration. Under the theory of dynamic capabilities, Teece (2007) classifies organizational sources of innovation and manufacturing, by the provision of sustainable advantage through the requisition of dynamic capabilities. These capabilities could be garnered, enhanced and upgraded through three key capacities: i) Sensing, ii) Seizing and iii) Reconfiguration or transformation (Teece, 2007). “Sensing” typically identifies and provides the basis of the commitment to the path towards capability expansion. This could help provide the origins of competitive advantage and superior performance (Amit & Schoemaker, 1993). “Seizing” is the position the organization takes to shape future capability expansions. It forms the basis for competitive advantage, which inherently lies in an organization’s resources and the way an organization “structures, bundles, and leverages those resources” (Connelly et al., 2011), from the resource-based view. It entails a market orientation for sustainability that focuses on market needs and requirements, as well as the interests of primary and secondary stakeholders, to thrive and adapt to the external environment to pursue the sustainability agenda (Kohli & Jaworski, 1990; Hunt & Morgan, 1995; Rasi et al., 2014). “Reconfiguration” points to the

processes, namely the routines, for organizational adaptability, which are employed by the organization to understand the changes that are in technologies and their markets, thus transforming the organizations in line with changing competitive environments. It requires continued scanning and benchmarking, and an effective evaluation of markets and their competitors, and obtain the transforming capacities of their configuration processes to retain their strategic advantage (Teece et al., 1997).

The need for a “dynamic and sustainable” view of the firm guides this research in that it provides the foundation for organizations to hone their competitive advantage within a dynamic market environment. The sustainability context is approached from the constructs of sustainability practices, namely Sustainability Exploitation and Sustainability Exploration (Maletic et al., 2014a). The research thereby outlines the path, positions and processes, which are detailed under the conceptual framework, to achieve the requisite innovation performance. Our research thereby outlines the dynamic capabilities of sensing with the path, seizing through the positions taken, and the transformation or reconfiguration achieved through the processes (Teece, 2007) which are detailed under the conceptual framework (Figure 1), towards achieving the requisite innovation performance.

Innovation Performance and the Triple Bottom Line

Sustainable innovation, or innovation from a sustainability perspective, is the generation, acceptance, and effective implementation of innovation that is based on concern for social equity and environmental integrity, without sacrificing economic prosperity which is often referred to as the the “triple bottom line.” This requires organizations to have a complete idea about the innovation antecedents for increasing innovation performance (Kamasak, 2015). Rouse and Daellenbach (2002), taking the resource-based perspective, considered that knowledge, technology, routines, strategy, structure and culture were crucial for innovation performance. Terziowski (2010) established the theoretical framework adopting the definitions of innovation that were integrative in nature, as put forward by Freeman (1982) and Bessant and Tidd (2007), whose model comprised of innovation strategy, customer-supplier relationship, formal structure, technological capabilities, and innovation culture as the independent constructs that predicted innovation performance. Butlin and Carnegie (2001) put forth that innovation performance antecedents were: an ambitious business agenda, clear purpose, and closeness to the customer, leadership, organizational culture, systems, infrastructure, skills and human resources. Felin and Hesterly (2007), for their part, regarded innovation performance to be linked with knowledge and goes along the actions taken by the individuals who manage this knowledge.

In today's business scenario, organizations have begun to include and address multiple stakeholder sustainability concerns through an array of innovation efforts. Thus, this research is timely for understanding how sustainability processes impact the broader innovation performance outcomes, as also viewed via the "triple bottom line" of social and environmental concerns, as well as financial performance. Prajogo et al. (2012) reiterates the commitment of organizations to develop their operations with environmental management standards, which benefits the triple bottom line performance.

The dynamic capabilities framework would regard Innovation performance as an organization's capacity to generate new value offerings by way of new products or services, through the adoption of new processes, technologies, management changes, market-focused approach, or processes associated with the creation of new skills and competencies (Miles et al., 1978). Innovation by itself is embodied by a wide scope of activities, such as producing new tangible value propositions or by creating new processes for conducting business. Innovation therefore is challenged as being far from having a single dimensional approach. The eventual purpose of innovation would be the provision of customer value in line with market needs, through new services or new products. From a sustainability context, this would bring about changes to an organization's processes which should not be looked at only from the financial or economic point of view to take up sustainability-related projects.

Based on the literature, the following hypotheses were considered:

Hypothesis 1: Stakeholder Sustainability orientation has a significant positive correlation to Exploration for sustainability and will be a significant predictor of Exploration.

Hypothesis 2: Stakeholder Sustainability orientation has a significant positive correlation with Exploitation for sustainability and will be will be a significant predictor of Exploitation.

Hypothesis 3: Stakeholder Sustainability orientation has a significant positive correlation with Innovation performance and will be a significant predictor for Innovation performance.

Hypothesis 4: Sustainable Market orientation has a significant positive correlation with Exploration for sustainability and Market orientation will be a significant predictor of Exploration.

Hypothesis 5: Sustainable Market orientation has a significant positive correlation with Exploitation for sustainability and Market orientation will be a significant predictor of Exploitation.

Hypothesis 6: Sustainable Market orientation has a significant positive correlation with Innovation performance and Market orientation will be a significant predictor of innovation performance.

Hypothesis 7: Sustainable Market orientation has a significant positive correlation with Organizations internal trust and Market orientation will be a significant predictor of Organizations internal trust.

Hypothesis 8: Organization's internal trust has a positive correlation with Sustainability Exploration and Organization's internal trust will be a significant predictor of Sustainability Exploration.

Hypothesis 9: Organization's internal trust has a positive correlation with Sustainability Exploitation and Organizations internal trust will be a significant predictor of Sustainability Exploitation.

Hypothesis 10: Exploration for sustainability has a significant positive correlation with Innovation performance and Exploration will be a significant predictor of Innovation performance.

Hypothesis 11: Exploitation for sustainability has a significant positive correlation with Innovation performance and Exploitation will be a significant predictor of Innovation performance.

Scale Usage and Construct Measures

The scales were selected with regard to their relevance to the study, as well as their established success in previous research with regard to reliability and validity. As regards the scale format, a 7-point Likert scale was used for all the constructs mentioned below and for eliciting responses from the executives. This would make it convenient for all the respondents to understand and enhance the response rate and effectively analyze the variances. To ensure continuity and fluidity in the instrument, this format was maintained throughout.

Stakeholder Sustainability Orientation: This is defined as the organization's awareness of the stakeholder's orientation or the customer's desire for products which are indeed environmentally and socially responsible. This helps understand the customer's perspective towards sustainability and their preference, thereby enabling organizations to understand the need and demands of the stakeholder. It is a known fact that customers today do consider environmentally- and socially-friendly products and services in their purchases (Closs et al., 2011). This research looks at its impact based on the perspective

of the targeted customer preferences or their alignment for sustainability. Previously, Diamantopoulos et al. (2003) tested a similar concept of environmental consciousness and customer sustainability awareness. The scale was adapted and expanded towards taking the perspectives of impact on sustainability and innovation capabilities, and utilized a similar format in the entire questionnaire.

Market Orientation: Narver and Slater defined market orientation as the organizational culture which requisitioned the appropriate behaviors for creation of value for their consumers, thereby leading to the business performances being successful (Kohli & Jaworski, 1990; Kotler, 1984). Sustainable market orientation was a strategy to focus on the market needs and requirements, and the interests of customers and stakeholders who were concerned with environmental, social and innovation capabilities towards achieving the same. The original scale of Narver and Slater (1990) was used to test dimensions of market orientation: long-term focus, competitor orientation, inter-functional coordination, profit orientation, as well as customer orientation. Here we looked to measure market orientation from the sustainability perspective based on the definition mentioned earlier.

Organization's Internal Trust: This refers to the organizational climate, which is an important aspect to make an organization productive and effective (Nakata et al., 2008). Its therefore important for the interconnections between an organization's departments and functions to go well beyond the basic actions of cooperation and communication, and needs to be of a social or relational nature, which also plays an equally crucial role. As defined by Nakata et al.:

Trust is the inclination of a party or the trustor towards being vulnerable towards the actions of the trustee or the other party based on the understanding that the trustee would perform the task that was crucial for the trustor, regardless of its capacity to monitor and control that other party. (Nakata et al., 2008)

Our research infers that the organization's internal trust is an essential requirement for effectiveness and efficiency of processes, and that it thereby impacts innovation performance of the organization. Inter-organizational trust is aimed at understanding the positive expectations which workers across organizations have on each other's abilities, and their motives and actions. The scale of Nakata et al. (2008) best suited the context of this research.

Sustainability Practices: The research takes exploitation and exploration issues to analyze the construct of sustainability practices, under the realm of sustainable development. Sustainability exploitation and sustainability exploration are both concepts that are connected mainly across the two value-chain domains of technology, with regard to product development and manufacturing, and marketing with product markets. The need to excel in both would require the organization to be involved with different types of innovation activities (De Visser et al., 2010).

From a sustainability point of view, organizations are required to devote their resources to requisition new sustainable products or services, while also developing and exploiting their competencies, to enable the capacity to make improvements towards the sustainability of existing products that could eventually provide competitive advantage. The relationship between sustainability practices and organizational performance has been considered by researchers to be positive, thereby indicating that organizations could enhance their competitiveness while concurrently supporting sustainable development (Wagner, 2010; Koo et al., 2013). We could infer that an organization has the opportunity to address sustainable development while improving efficiency, increasing its rate of innovation, reducing costs, and enhancing profitability (Schaltegger & Wagner, 2006; Koo et al., 2013). Therefore, we could establish that increases in the extent of sustainability practices would have sustainability exploitation and sustainability exploration to move towards an improved economic performance (Wagner, 2010), innovation, environmental, and social performance (Weber, 2008). Taking the construct scales of Maletic et al. (2014b), this research looks to empirically validate the use of the processes of sustainability practices, and to provide insights on how exploration and exploitation concepts can be applied to organizational sustainability and their impact on an organization's innovation capabilities.

Innovation Performance: The scales utilized were adapted from Zhou et al. and Bansal (2005), considering economic, environmental, and social perspectives. This research regards innovation performance as a multidimensional construct which consist of the measures of environmental integrity, social equity, and economic prosperity—otherwise known as the “Triple Bottom Line.” These measures used took into consideration social performance, economic performance, and environmental performance, and were that of Maletic et al. (2014a), which goes in line with the objective of this research.

Methodology

The research for testing the framework used mixed-method surveys via an online administered questionnaire and mail survey that were conducted in two phases. A probability-based sampling method was utilized, with the surveys' responses forming the sampling frame. The mixed-mode approach was considered to enhance the response rate. The targeted organizations were affiliated with chambers of commerce and industry, and, using a probability-based random sampling approach, a respondent sample of 225 was sourced and confirmed. The organizations were predominantly focused on innovation as envisaged by their chambers and as expected by the state government policy, under the national innovation policy. The organizations were approached in two phases: the responses were first sourced from the organizations through questionnaires that were mailed and also administered online; and the second phase wave sourced the information by directly targeting the non-respondents, who were contacted individually in order to enhance the response rate.

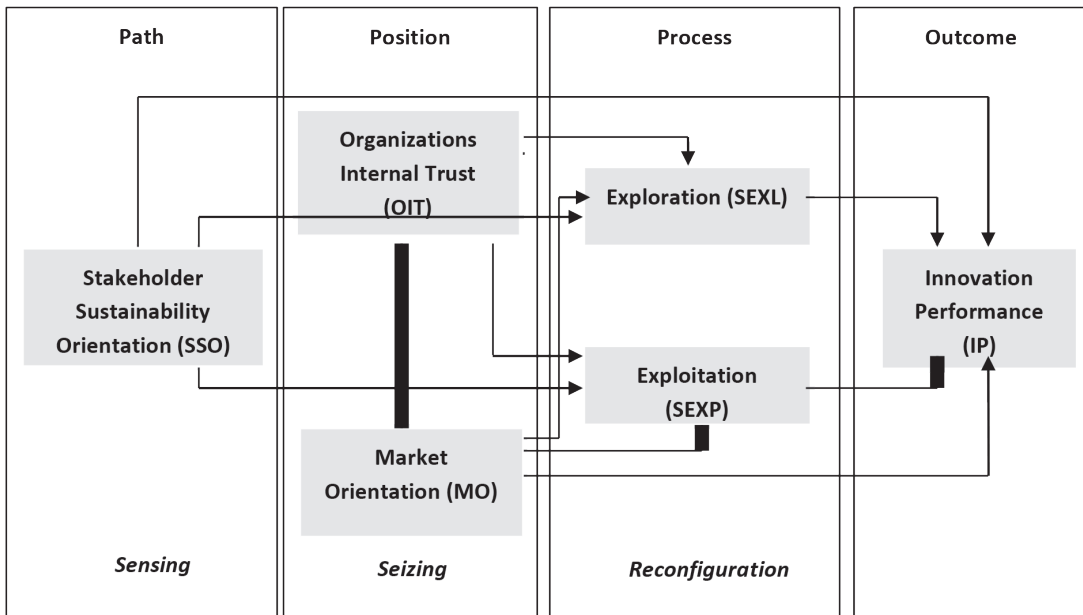


Figure 1. The Research Model

The scales were selected based on their relevance to the study, and also on their established success in previous research with regards to reliability and validity. The sampling approach was aimed at achieving a random sample that effectively represented the major constituents of the population, which would help the researcher to provide estimates of the perceptions and outcomes of the larger population. The respondents targeted in this

study were top management, managers or researchers at R&D within the organization. The organizations were predominantly from Bangalore of the state of Karnataka, whose government is focusing on Innovation strategies and is regarded as a prospective innovation hub of India, it's the presence of many organizations and SME firms across diverse sectors making it a suitable selection for India.

A total number of 163 completed responses were obtained. Therefore, the final sample size stood at 163 duly completed responses, upon removing incoherent responses. The final response rate was a good 74 percent, which implied that the chances of a non-response bias were lower. Having an adequate sample size was important to eventually validate the results and ensure their reliability. The confirmed respondent population of 225 required a sample size of 143 at a 95 percent confidence level and a five-percent margin of error. Additionally, the sample size, though small, would need to have a minimum number of samples for analysis utilizing the structure equation model, as outlined by Bollen (1989). The sample size under consideration had to be in line with the number of parameters. Therefore, the sample size was proportional to the parameter number. Weiss, and Linderman, Merenda and Gold (1980) have suggested that the ratio between the sample number and the parameters considered be 20 to 1. This research, with six parameters, had the expected sample size of 120; hence, the final sample size of 163 suited the considered sampling approach.

Data Analysis Methods

The research data analysis comprised of descriptive statistics, their reliability estimation, factor analysis, correlation analysis, and, finally, path analysis performed using computer statistical packages. Path analysis best suited this research to examine the correlation between the variables as hypothesized. To confirm the measurement model, exploratory factor analysis (EFA) was undertaken using popular computer statistical programs. Additional analysis was done to confirm the mediation analysis, which was performed to “indirectly assess the effect of a proposed cause on some outcome through a proposed mediator” (Preacher & Hayes, 2004). Sobel tests were performed to examine the mediating effects, adhering to Preacher and Leonardelli (2003) guidelines.

Results and Hypothesis Testing

The analysis comprised mainly of three stages. The first stage was conducting an exploratory factor analysis (EFA). This was followed by the second stage, a confirmatory factor analysis (CFA). The third stage tested the structural model or hypotheses using a path analysis approach, and confirming the model fit.

At the outset, the characteristics of the sample were ascertained, followed by the data analysis stages and the subsequent results of the analysis. The demographic variables were analyzed to understand the characteristic of the sample. Three variables considered for the analysis were: the age of organization, size of the organization, and type of industry. Organizations of different sizes could always exhibit different characteristics as well as resource allocations. Larger organizations often have sufficient resources towards managing development activities for a new product, compared to smaller ones. The research also looked at the percentage of time spent in the pursuit of sustainable innovation by the other organizations. Measurement of the age of organization considered the years since establishment. Profiles of the respondents were identified by asking their primary function and position within their organization, and the organization's primary industry. The responding organizations came from across the industry classifications of Manufacturing, Accounting/Auditing/Financial/Leasing/Consultancy, Information technology (IT) and IT services, Educational/Research Institutions, Hotels/Travel/Tourism, Satellite/Telecom/Electronics, Agribusiness/Biotechnology, and Others.

Table 1 shows the mean, standard deviation, and correlation amongst the variables. As shown, the standard deviations ranged from .95 to 1.12, thereby showing a fair degree of variance with regards to the responses. Multi-collinearity was considered a problem when the independent variables are correlated highly with each other. The correlation of well above the 0.8 range would indicate a multi-collinearity affecting the determination of contribution. All the correlation coefficients of the variables ranged from 0.46 to 0.78, at the 0.01 level of statistical significance. Additionally, to confirm if multi-collinearity was a concern for the sample, the respective VIF values were computed. All the values were below the cut-off value of 10, confirming that multi-collinearity was not a problem and we could proceed for further analysis.

The descriptive statistics for the respondents who took the survey included the scores, the mean and standard deviations for all items. The two leading functions from which the respondents were essentially constituted, were: general management at 50 percent, and research and development and development at 22 percent. The organizations were predominately from the two main industrial sectors of manufacturing (51 percent), and information technology and enabled services (IT/ITES) (24 percent). The majority of the respondents were from senior management (50 percent) and owners/CEO (26 percent). This confirmed that the sample was able to provide quality data that would be required towards achieving the research objectives. The other interesting aspect was that 44 percent of the respondents across the two year period spent 21-40 percent of time on sustainable innovation, followed by over 30 percent that responded as spending less than 20 percent.

Table 1. Mean, Standard Deviation, and Correlations

	Mean	SD	1	2	3	4	5
1. SSO	5.47	0.96	1				
2. MO	5.90	1.06	.78**	1			
3. OIT	5.91	0.98	.47**	.66**	1		
4. SEXP	5.30	1.05	.81**	.72**	.62**	1	
5. SEXL	5.87	0.95	.41**	.54**	.36**	.46**	1

**Correlation is significant at the 0.01 level (2-tailed).

The organizations, from an economic perspective, confirmed that their consumers regarded their new products and services as being innovative. New technology adoption in the organization was faster than at their competitors, affirming their competitive advantage. And from the social perspective, the organizations during the past three years found their employee relationships to have strengthened social links and the employees' motivation had increased; and importantly, from the environmental perspective, reaffirmed that the efficiency of the consumption of raw materials has improved during the past three years. This could lead to the inference that the impact on innovation performance positively affected the triple bottom line.

The confirmatory factor analysis was conducted in line with the conceptual model, after the poorly-loading items that were cross-loading to other constructs as mentioned earlier were removed, ensuring a reliable model fit. The eventual CFA results on imputation that comprised thus the six variables show the model was a very good fit with: chi-square = 2.766, d.f. =2, $p < .001$; CFI = .999; NFI = .997; GFI = .994, and the RMSEA = .049.

On confirming the model fit, a path analysis approach was utilized to outline the correlation matrices and better understand the hypothesized relationships of the research and test the causal paths amongst the variables. The subsequent regression analysis showed that Stakeholder Sustainability Orientation was found to be a significant predictor of Exploitation, at the $p < .001$ level of significance, and had a positive correlation to exploitation, and hence Hypothesis 2 was supported. Exploration was strongly predicted by Market Orientation and had a positive correlation to it, and hence Hypothesis 4 was supported. Further, Market Orientation was again found to be a significant predictor of Exploitation at the $p < .001$ level of significance, and also had a positive correlation to exploitation, and therefore

Hypothesis 5 was also supported. Market orientation was again found to be a significant predictor of organizations internal trust at the $p < .001$ level of significance and also had a positive correlation to market orientation, and hence hypothesis 7 was supported. The impact of Market Orientation significantly predicted Innovation Performance and had a positive correlation to innovation performance at the $p < .01$ level of significance, and hence Hypothesis 6 was supported. Exploitation was again a significant predictor of Innovation performance at the $p < .01$ level of significance and Exploitation had a positive correlation to exploitation, and hence Hypothesis 11 was supported.

The Stakeholder Sustainability Orientation was not found to be a significant predictor of Exploration and had a negative correlation to exploration, and hence Hypothesis 1 was not supported. Stakeholder Sustainability Orientation did not significantly predict Innovation performance and had an r value of .102, and hence Hypothesis 3 was not supported. The Organizations Internal Trust was not found to be a significant predictor of Exploration and had a negative correlation to exploration, and hence Hypothesis 8 was not supported. Organizations Internal Trust was again not found to be a significant predictor of Exploitation and had a positive correlation to exploitation, and hence Hypothesis 9 was not supported. The correlation between Exploration and Innovation performance was found not to be significant and had a negative correlation to exploration, and hence Hypothesis 10 was not supported.

Path Analysis Results: The overall structural model is the final model and tests the relationships between the Stakeholder Sustainability Orientation (SSO), Organizations internal trust (OIT), Market Orientation (MO), Sustainability Exploration (SEXP), Sustainability Exploitation (SEXL) and Innovation Performance (IP). The hypothesized model shows the variables Stakeholder Sustainability Orientation, Market Orientation and Organization internal trust as having a correlation with Exploration, Exploitation and Innovation Performance. Correlations were also expected for: The relationships of Exploration with Innovation Performance and also that of Exploitation with Innovation Performance; as well as for the earlier-tested direct relationships of Stakeholder Sustainability Orientation and Market orientation with innovation performance.

The direct and indirect or mediated effects were examined for the model. The reduced model (Figure 2) shows the outcome of the results and indicates the negative relationship between the Stakeholder Sustainability Orientation and Sustainability Exploration, which was significant with a standardized regression coefficient of $-.071$ at $p < .001$. The relationship between Market Orientation and Sustainability Exploitation was positive and significant with a standardized regression coefficient of $.698$ at $p < .001$, and the

relationship was also positive and significant between market orientation and Sustainability Exploration, with a standardized regression coefficient of .607 at $p < .001$. The R2 value of Exploration (30.3 percent) and that of exploitation was good (87.0 percent). The relationship between Market Orientation and organization's internal trust was positive and significant, with a standardized regression coefficient of .659 at $p < .001$ and R2 value of 43.5 percent.

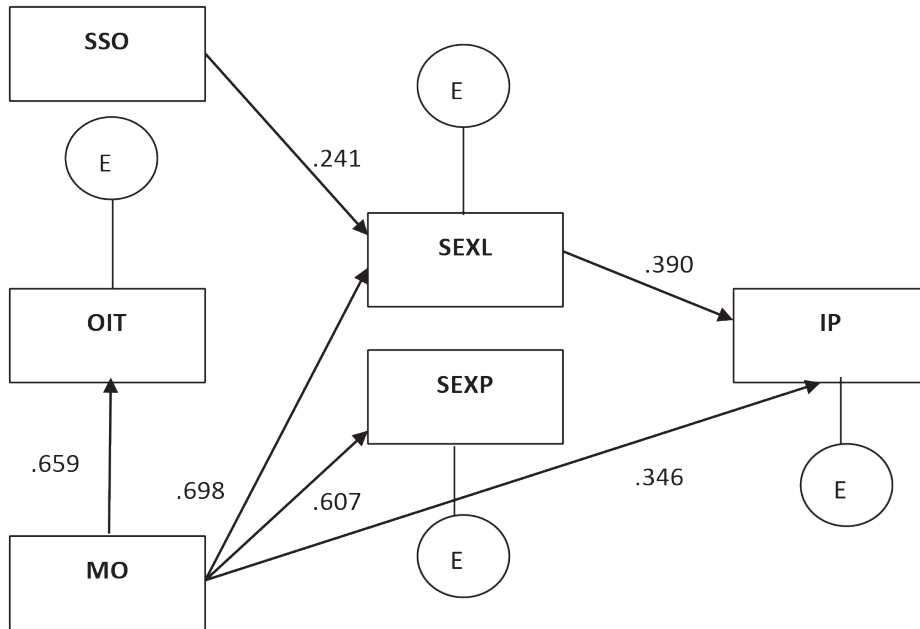


Figure 2. Regression Analysis Results

There was no direct significant relationship between Exploration and Innovation performance. But a positive relationship was observed between the Exploitation and Innovation performance which was significant with the standardized regression coefficient of .390 at $p < .05$. A positive direct relationship was also observed for Market orientation and Innovation performance which was significant with the standardized regression coefficient of .346 at $p < .001$. A R2 value of 69.4 percent was observed for Innovation performance. The CMIN statistics for model fit were looked at with the values for Goodness of Fit Index (GFI), the Normed Fit Index (NFI), and the Comparative Fit Index (CFI). The model had a GFI value of .990. The criterion as suggested by Ingram et al. (2000), is a GFI value of .90 and above that is required for the model to be considered a good fit. The NFI value was .994 and the criterion as suggested by Tabachnick and Fidell (2001) is an NFI value of greater than .90 to be indicative of a good-fitting model. The CFI value of the model was .997. Hu and Bentler, suggested a CFI value greater than .95 is indicative of a good-fitting model (Tabachnick & Fidell, 2001). Overall all the three indices suggested that the tested structural model is a very good fit.

Discussion

The central research question was related to identifying the determinants that foster innovation performance from a sustainable development perspective. The research has essentially tried to understand innovation performance not just from the “economic” impact but also from the “social” and “environmental” dimensions, or the organization’s triple bottom line. The novelty of the research lies in the fact that it brings the combination of a developmental approach to sustainability with the business strategic approach through the dynamic capabilities, to provide a practical basis for an organization’s uptake of sustainable innovation. It further provides the basis to elicit the capabilities required to nurture sustainability practices of sustainability exploration and sustainability exploitation, for a broader understanding of their requisite impacts on innovation performance from the economic, social and environmental perspectives. The approach to this research looked at the determinants of sustainable Innovation capabilities from three dimensions under the approach of the dynamic capabilities. They are outlined utilizing the dynamic capabilities framework, under the requisite capacities of “Sensing,” “Seizing,” and “Reconfiguration” of processes, leading to their subsequent outcomes.

The Capabilities Affecting the Innovation Performance

The theoretical framework suggests that organizations pursue the processes of sustainability practices, of sustainability exploration and exploitation, to meet the perceived needs of consumers and stakeholders. There is a need to better understand the systems and factors which address sustainable practices (Flannery & May, 2000), and this research has been able to do just that, providing a practical basis to understand the implementation of the sustainability agenda.

Asif et al. (2013) suggest that it is important to identify stakeholder demands, which then need to be incorporated into business processes. This requires an approach that is systematic, and is made effective through planning, resource management, and process design, thus ensuring continuous improvement. The role of stakeholder sustainability orientation on both sustainability practices of exploitation and exploration was confirmed. In the Indian context, this was identified under the research model, whereby it was crucial for the organizations to understand the sustainability orientation of its consumers to implement the sustainability agenda, and to align their paths so they may develop the capability to sense their sustainability needs. The direction of the impact of the uptake of sustainability practices was dependent on this. Stakeholder sustainability orientation was found to have a positively significant relationship with exploitation, and the converse with exploration. Organizations in India have predominantly aligned themselves to the sustainability practices

of exploitation, as this was cost effective, being less risk oriented. On the other hand, the predictive capacity for exploration, where larger levels of innovation focus are required, was lacking under the Indian context, indicating that the pursuit of sustainability exploration practices is a necessity for the eventual success of sustainable innovation.

The other factor was the capability to seize opportunities through market orientation, which was found to predominantly affect innovation through a direct relationship. It also positively impacted both exploration and exploitation, as observed under the model. From an Indian perspective, the predictive capacity of an effective market orientation on innovation performance had enhanced organizations' capacity to confirm the uptake of sustainable innovation. The results confirm that a general overall consensus exists within organizations, but the capacity for implementation could eventually be a stumbling block against its effectiveness.

The levels of trust that exist internally among key stakeholders of the organization—namely, their human capital—with regards to work competency from a sustainability perspective was duly confirmed in our research. This confirms the significance of the social aspect to innovation performance, and this aspect is further reinforced through the organization's internal trust, which effectively provides the capability to enable an effective uptake of sustainability practices across organizations in India. This signifies that an enhanced knowledge-base and champions to win the buy-in for the sustainability agenda are necessary.

The significant positive relationship of an organization's internal trust to market orientation confirmed that organizations should pursue the capabilities in tandem with effective uptake of Sustainability practices, as identified under the reduced model. The relationship of market orientation with an organization's internal trust was an important learning for organizations pursuing innovation, as this helped them fill the implementation gaps for the effective uptake of sustainability practices. Under the Indian context, a cultural change was required for firms to focus not merely on the short-term economic perspective, but to effectively pursue and incentivize exploration practices for the long term. This reiterates the importance for organizations to take a capacity-aligned path, to “sense” the stakeholder's orientation, “seizing” the opportunities with a clear, focused market orientation, coupled with an enhanced organizational internal trust environment to effectively implement the sustainability agenda—hence confirming these variables as the drivers for sustainable innovation.

Impact of Innovation from the Sustainable Development Perspective

This research looked to identify the role played by the intervention of sustainable practices under the constructs of “Sustainability exploration” and “sustainability exploitation.” The novelty of this research was to analyze and provide the empirical grounds for achieving sustainable development through the combined pursuit of Sustainability practices, by examining their effects on innovation performance across the triple bottom line.

The sustainability practices of exploration and exploitation take the model of Gomes et al. further by providing the process management aspect for technological, environmental, social and economic resource efficiency. From the researcher’s perspective, this provides the basis for understanding the interplay among the organization’s different stakeholders towards creating ecological, social, and economic value. It provides the model to establish a link between the organization, and sustainable production and consumption. The Innovation activity and their processes have become a crucial growth driver, and those countries which do not adopt new technologies will not grow as fast as those that do. This requires organizations to have a complete idea about the innovation antecedents for increasing innovation performance (Kamasak, 2015), and implies the need to reconfigure the processes towards achieving sustainable consumption and production.

The findings show that, under the Indian context, the sustainability practices have clearly had a significant positive relationship with sustainability exploitation, in which organizations focus more on incremental and frugal innovations. This organizational approach has contributed to the decline of India’s innovation performance, and requires the environment to provide incentives towards taking greater risk, instead of making the organizations risk averse. The research findings on its positive impact on the economic, environmental, and social parameters of innovation performance have confirmed the benefits of sustainable development.

In addition, the direct relationship of market orientation to innovation performance confirms the existence of a sustainability awareness across Indian organizations, therefore making the uptake of sustainable innovation a feasible reality. That said, it calls for the organizations in India to have both exploration and exploitation processes in tandem, towards enhancing the dynamic capabilities and competitiveness. The eventual benefits of innovation on the triple bottom line would require the Indian organization to have a focused approach to sustainable development, not merely for the short term but over the long term. This infers that organizations do have the capability and the opportunity to address sustainable development while improving efficiency, increasing the rate of innovation, reduction of costs, and enhancing profitability (Schaltegger & Wagner, 2006; Koo et al., 2013).

In the reduced model that included all six variables, the Sobel test static reconfirmed the mediating effects of exploitation on market orientation and innovation performance, with a score of 3.15 which was significant ($p < .001$). According to the results of this research, it was observed that all models had instances where the intervening variables mediated the relationship between the independent variable and the dependent variable. The findings of the mediation effects of exploration on the Organization's internal trust and innovation performance, exploitation's mediation effect on market orientation and innovation, as well as the mediation effect of exploitation on stakeholder sustainability orientation and innovation performance reaffirm the role of both sustainability practices in the pursuit of sustainable development in India. The results reaffirm that the pursuit of a sustainable development agenda is indeed a worthwhile initiative for organizations, and that it is indeed an effective and feasible proposition for enhancing the innovation performance of a developing country as India.

Recommendations and Implications

This research is among the few empirical studies that have looked at sustainable innovation and its impact on the triple bottom line. This, from a theoretical perspective, helps bridge the sustainability gap towards fostering innovation performance. The framework clearly identifies the antecedents to innovation performance and helps expand the domain of sustainability from an organizational or corporate perspective. Our research puts forward the significance of having an organization-wide approach to undertake innovation from the sustainable development perspective. The empirical analysis reaffirms that having a market-oriented strategy is crucial for the success of undertaking sustainable innovation.

This research study clearly proves the sustainability practices' impact on the triple bottom line. The sustainability practices are dependent on the organization's wide orientation, which is crucial for bridging the sustainability gaps. This is required for the efficient and effective pursuit of sustainable innovation, which builds competitive advantages while bringing about desired returns in the appropriate frame of time. A conducive environment is needed for the sustainability agenda to bring in positive returns for the organization, which impacts not just its economic but social and environmental parameters as well. This over a period of time from the capabilities perspective would certainly be a strategic advantage, which becomes a necessity for the organization, rather than a mere option.

Policy Implications: From the Indian experience, organizations have focused on taking incremental steps to imbibe sustainable innovation, as was confirmed by the significance of exploitation over exploration. Interestingly, from the contextual basis, this also subdues the significance of champions, who would predominantly promote innovation through exploration. This calls for policy interventions to promote the push for sustainability exploration practices that would match the nation's excellence in "frugal innovation," and ensure the move up the value chain with more "breakthrough innovations."

The following are therefore recommended:

- The government should enhance the resource allocation for research and development, which has more or less stagnated over the years.
- The performance of India in innovation clearly indicates the need for government to have a renewed focus on sustainable exploration practices in its national innovation policy, to help organizations develop the capability to move up the value chain.
- The government should provide a fresh impetus by creating a conducive environment for promoting greater private-sector investment in sustainable innovation. This could be through special tax incentives and subsidy schemes that enable an effective technology transfer across key stakeholders.
- The government should have policies that facilitate collaboration through public- private partnerships. This could be done with increased allocations for research and development that are realized via cross-sector partnerships. It would also positively influence the market environment and stakeholder orientation towards effectively promoting the sustainability agenda.
- The government should implement policy that takes a holistic approach across sectors to promote innovation. This would require institutions and their supporting organizations to have the requisite feedback, to regularly evaluate the implementation of sustainable innovation to be effective in dynamic environments.

Practical Implications: The research stresses the importance of a holistic perspective for the effective pursuit of sustainable innovation. We clearly outlines the importance of having a market-oriented approach that aims to address stakeholders' concerns and needs for implementing sustainability initiatives.

The following are recommended:

- Organizations should focus on building their trust environment within the organization to foster innovation, where the organization promotes the sharing of ideas, and pursuit of projects with risk are rewarded.

- Organizations should be aware of the target market with a clear market orientation, taking into consideration the concerns of the organizations' stakeholders regarding sustainability initiatives to positively impact innovation performance.

- The organization should foster the pursuit of sustainability practices by assessing the impact on the triple bottom line, supported by regular evaluation innovation processes. This study's empirical findings have clearly shown that a focus on economic, social, and environmental factors does positively impact innovation performance.

- Organizations should identify the dynamic capacities and their impact on innovation performance from a long-term perspective. They should recognize their market-orientation capabilities towards maximizing their congruence with the requirements of its key stakeholders, in line with the community's needs.

- Top management should make use of this research's findings as the basis for improving sustainability practices and adopt a policy that pursues both exploitation and exploration to strengthen innovation performance and help them move up the value chain.

- Organizations should use a combination of developmental approaches to sustainability along with the business strategic approach through the dynamic capabilities, to provide a practical basis for an organization's uptake of sustainable innovation. Towards this, a community development initiative could be started to ensure greater buy-in of the sustainability agenda. Propagating the benefits of sustainability across its key stakeholders is crucial for the eventual success of the sustainability agenda.

Research Implications: This study is amongst the few empirical studies which examine innovation performance and its impact on the triple bottom line. Our research identified the antecedents of Stakeholder sustainability orientation, market orientation, and organizations' internal trust. We also identified the significance of the processes of sustainability exploitation and exploration, under the context of sustainable development, which has not been hitherto adequately assessed in literature. The holistic framework that assesses sustainability from the dynamic capabilities perspective reaffirms the positive impact on social, environmental, and economic performance. This makes it pertinent to look at other antecedents that could better fit under the research model. The novelty of this research lies in its important theoretical contribution to the body of knowledge of sustainable innovation, by providing a holistic approach that combines a developmental approach to sustainability with the business strategic approach through the dynamic capabilities, to provide a practical basis for an organization's uptake of sustainable innovation.

The research was cross-sectional in nature and future research could look in to specific sectors for industry-specific implications. Future research could also look at analyzing sustainable innovation projects from a specific industry perspective across their different stages, to get a detailed understanding of sustainable innovation impacts. Furthermore, the sample size of this study was relatively small and future studies could target a larger sample size to further enhance statistical precision. There is indeed scope for streamlining the methodology with a targeted approach devoid of the constraints of acquisition time, as e-mail yielded negligible response rates.

Conclusions

This research aimed to ascertain the determinants that nurture sustainable innovation from a capabilities paradigm. We looked at this through the lens of the dynamic capabilities theory, to define the determinants and conditions that achieve innovation capability from a sustainability dimension. The study examined the relationship between stakeholder sustainability orientation, market orientation, organizations internal trust, the process variables of exploration and exploitation, and their eventual impact on innovation performance.

The detailed analysis concluded that market orientation did directly impact innovation performance. Market orientation also has a strategic significant relationship with organization's internal trust. Interestingly, stakeholder sustainability orientation had a positive relationship with exploitation, although the converse was true with exploration. The prominence of the pursuit of exploitation under the Indian context was identified; hence we could conclude that the focus towards exploitation of existing capabilities did eventually impact the success of sustainable innovation. This study research importantly confirmed the impact of innovation, and the identified antecedents, on the triple bottom line through innovation performance. The research also helped reaffirm the fact that the sustainability practices of exploitation and exploration from the sustainability perspective were indeed interdependent. The main proposition, to balance of the practices of exploration and exploitation in line with the orientation of their stakeholders and environments, is always a challenge specific to their environmental context, as observed in the research findings. The research importantly confirmed the basis for the pursuit of sustainable innovation by organizations, and for future research to attribute this outlook as a competitive and strategic advantage for organizations, both in the short and long term.

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