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# The role of organizational orientation and product attributes in performance for sustainability.

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## Abstract

As regulation pushes for sustainability, organizations may choose to strategically orient themselves sooner rather than later for the inevitable move for more promising returns. Design and development of products for sustainability reaches the core of organizational operations and those that can orchestrate a meaningful shift to sustainability may gain in the long-run. The product itself and how it is perceived by the end-user may also significantly affect this move to sustainability for the organization. This research empirically tests the relationship between organizational orientation toward sustainability, attributes of sustainable products and the effect these have on performance in two separate geographical locations with differing economies. The value of this paper lies not only in empirically validating concepts from traditional new product development literature perspective in the context of sustainability but also in providing an insight into the current ‘mindset’ toward sustainability.

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## 1. Introduction

Increasing regulation in a post-crises global economy finds business and product sustainability to be an inevitable reality [1-5]. For survival in the long term, organizations should consider orienting themselves toward sustainability at the strategic level. Yet, more than this, the focus should now be on introducing processes that support the design and development of sustainable products that improve the performance of the organization without negatively impacting society and the environment at large [6-8]. With respect to

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meaningful performance for an organization, a sustainable product must be able to compete with – or rather be more attractive than - “regular” varieties of the same currently on market [4], [9-13].

Though work has been done on unitary levels of organization or industry, the question on whether the product itself can attract the consumer’s attention via its characteristic has also not yet been tested empirically in the sustainability context. Moreover, literature on sustainability can be described as formative at best and somewhat nebulous at present, a precise and standardized definition of a ‘sustainable product’ has not, at the time of this research, been widely agreed upon in research published in peer-reviewed journals

As a starting point, the ability of a sustainable product to competitively perform in the market is an important point of study. This study empirically tests whether the connections between strategic organizational as well as product sustainability and the triple bottom line of performance hold true in the real world. More specifically, this research explores whether organizational orientations leading to sustainable product attributes have meaningfully begun to affect organizational performance, both for the triple bottom line as well as strategically.

## 2. Literature Review

Research on sustainable development has evolved and found enthusiastic researchers within the field of management, questions have been raised as to what exactly differentiates the sustainable system, the sustainable organization, the sustainable supply chain and so on from the regular varieties of the same [1], [4], [6], [10-13].

Previous studies have researched the meaning and consequences of product life-cycles and arrived at the conclusion that social and environmental responsibility mandates closing life-cycle loops either by strengthening reverse logistics or by redesigning products that are more amenable to disassembly and reuse at multiple fronts, using strategies such as life-cycle assessment (LCA) [13-17]. With the addition of sustainability concerns, the concept of the closed life-cycle loop has advanced in research to reflect social, environmental and financial needs of the system each product exists within. This includes the organization handling its product conceptualisation, modification, development, production and marketing in a more sustainable way.

Sustainability as related to society is very much different than the sustainability of a business. Both of these are fundamentally different when the level of their operations; their impact as well as their scope is considered [25-26]. Over time, as perception and ability evolve, the attributes of a product that make it sustainable also change. However, it is first incumbent to perform a primary assessment of whether a sustainable product can successfully ‘make its mark’ in the market as a stand-alone option for the buyer.

### 2.1. Product Attributes

In this research the attributes of sustainable products are hypothesized to play an augmenting role to the concept of re-engineering products for rebirth, a better life-cycle and eventually better organizational performance. This may be studied by virtue of how attractive the adoption of such products may appear to the consumer, in the following manner [27-29]. In understating the mechanisms of adoption, studied well in the extant literature, and examining the potential for a link between these and how sustainable products might be received (adopted) by customers, a relationship may be established between such products and the relevant dimensions of performance of a firm. The assessment of how attractive a sustainable product may be, and for what reasons, is found to be based on the three-part model of social contagion [31] adapted from evolutionary biology [32-34] and tested by Langley, Bijmolt, Ortt and Pals [28] in the context of what stimulates new product adoption and usage; as a part of extant new product development (NPD) literature.

The process consists of three main components, which deal with the following behaviours. First, the behaviour related to being attracted to use or adopt the new product; second, the behaviour related to the correct use of the new product and third, the behaviour related to the continued use of the new product over a long period of time. These three attributes (Product Fecundity, Product Fidelity and Product Longevity) relating to the adoption and the correct as well as long-lived use of a product are seen to affect the performance of a firm [28]. The authors however, have only tested the effect of consumer behaviour in the context of new products, this research moves to test the attributes of the products themselves, and in a context of sustainable products and the effect on performance.

## 2.2. Performance

The triple bottom line (3BL) concept of performance, coined by John Elkington [34] has been widely discussed in sustainability literature, to the extent that most definitions of sustainability aspects include this performance type (see Table 1.1) [1], [8], [18], [36-39]. The triple bottom line may ideally be seen as a tool to determine the progress toward sustainability based on how the three performances are measured [40-41].

In addition to the triple bottom line, strategic performance is of paramount importance at an organizational level. As stated by Kandemir and Acur [42], strategic performance is seen to encompass the following aspects: (1) the creation of opportunities in the marketplace for products, (2) the fit of these products with the market conditions and moreover demands as well as, (3) the ability of the organization to achieve specific product attributes based on their information. Studies show that potentially hidden opportunities may be largely rewarding, in terms of increased strategic performance, for an organization aiming to successfully integrate sustainability issues into its products [42-44]. Consequently, those organizations that not only identify such opportunities but also acquire the related knowledge to develop products more responsive to market conditions are likely to perform better strategically as well as better meet unarticulated customer needs [43], [48-49].

With the 3BL performance measures in place, social, environmental as well as the requisite financial/economic dimensions are taken into consideration, assisting in the achievement of sustainable product development. The three aspects of the triple bottom line are economic performance, social performance and environmental performance. It is worth noting however, that with respect to the 3BL the different performances, including strategic performance, may not necessarily be independent of each other.

## 3. Model and Method

On analysing the review of the literature available in the area, a theoretical framework is proposed as follows (Fig. 1).

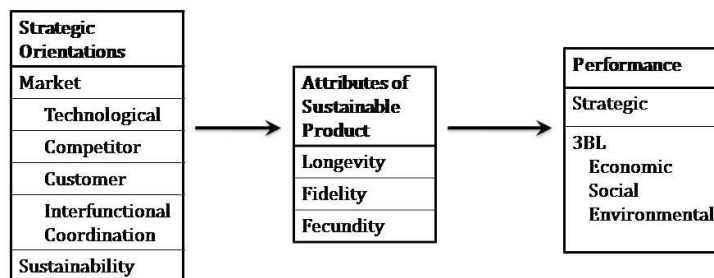


Fig. 1. Theoretical Framework

The above framework posits that an organization's strategic orientation in the market affect the kind of product it would produce, which would be responsible for the attributes (or characteristics) of the products in question.

*H1 (i - xv): Strategic orientation positively affects the attributes of sustainable products.*

*H2 (i - xii): Attributes of sustainable products positively affect aspects of performance of an organization.*

In the situation where an organization wishes to produce sustainable products, the organization's strategic orientation would include sustainability orientation, which in turn, is expected to affect the product development processes. These product attributes themselves, by way of attracting (or failing to attract) the end-users would affect the performance of the organization overall, in terms of strategy as well as the effect on the triple bottom line.

### 3.1. Research Design and Data Collection

This research empirically investigates a cross-section of large to medium-large high-technology firms in North America (USA, Canada) and India (with 300 employees or more, as defined by Stastics Canada, 2011). The data for analysis was collected from designations similar to Directors, Presidents, Senior Scientists, R&D Team Leads, Project Managers and Chief Operating Managers in charge of Product Development via a self-administered online survey. The study provides insight into what constitutes sustainable product attributes for this industrial cross-section and what factors may lead to creating sustainable products which affect various overarching aspects of organizational performance. It is expected to be generalizable to any firm that develops and manufactures/produces/processes (incrementally or radically new) sustainable products.

### 3.2. Data Analysis

The data collected from the questionnaire was first entered into the software most appropriate for preliminary analysis - SPSS, and later in LISREL. CFA of each of the constructs was conducted to determine construct validity in LISREL. SEM was then conducted in LISREL on the *a-priori* model and fit statistics were verified to confirm whether the data fits the hypothesized model.

## 4. Results and Discussion

An acceptably balanced division of responses were received from both geographical regions, with the highest percentage of respondents being company directors, general managers or presidents/vice-presidents. The largest industries represented were of general small manufacturing, electric and appliance manufacturing as well as computer and electronic product manufacturing. An overwhelming number of firms operated on a multi-national level, whereas a number of these conducted global operations. The goodness of fit statistics of the model showed a very good fit (according to guidelines by Tabachnick and Fidell [56]), as seen in Table 1.

Table 1. Goodness of fit indices

GOF Indices	Output
Chi-square/df	2.34 (< 3)
CFI	0.92 (> 0.8)
NNFI	0.92 (> 0.8)
RMSEA	0.083 (< 0.1)

The paths from the organization's strategic orientation to the attributes of the products and from the product attributes to the performance of the organization are found to be positive and significant in magnitude. From the loadings analysed, it can be seen that the orientation loading highest on the second order construct was sustainability orientation. The attribute considered most important, or attractive, in sustainable products was their lifecycle longevity and the dimension of performance that was affected the most was social performance.

This kind of result may indeed be said to be expected, from the review of the literature previously conducted. In the case where a product is transitioning to being sustainable, the organizational focus is bound to be most on sustainability. It may be concluded that the strategic orientation of an organization with respect to sustainable products should specifically define the approach to the product attribute mix, as well as the attributes themselves increase performance to a certain degree. Consequently, since the attractiveness of the product is dependent on the product as well as the consumer, social performance would logically be the most prominent concern. This is not to say that the dimensions of performance are less important, the loadings encountered were significant and positive for all the orientations, the attributes as well as the aspects of performance. In fact, each dimension of performance loaded quite strongly on the total construct, indicating an overall strong link. Thus, the hypotheses H1 (i - xv) and H2 (i - xii) were concluded to be supported.

## 5. Conclusion

There are a number of interesting conclusions that can be drawn from the discussion of results above, which are enumerated briefly below. With respect to strategic orientation, it is seen that most organizations have begun to proactively create a sustainability orientation, not only due to customer demand but because they find that an orientation towards sustainability actually provides an advantage in their particular case. Also, it may be safely concluded that organizations have begun to move past the previously held view that sustainability is an added burden and focus on the elements that render sustainability a win-win situation with significantly better returns. This is verified by the strength of the indirect relationship between the organizational orientation and its performance. Further, it may be well noted that the triple bottom line has been very strongly represented by good loadings in the empirical study, which bears out its importance as a holistic measure, rather than just a focus on economic (financial) performance, which was the sole traditional yardstick of success. This study makes a significant academic contribution by empirically testing conceptual relationships from new product development literature in the context of sustainability. Moreover, this study is instrumental in proving the importance of sustainability as a viable alternative to traditional products, which may indeed yield vastly superior returns in the long run. The study is subject to the limitations of its sort, such as potential introduction of bias from the point of view of social desirability. Results should also be interpreted with care when applying to contexts other than the geographical locations within which the study has been conducted.

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