The Impact of Organizational Innovation on Sustainability in Jordanian Pharmaceutical Companies

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Abstract

Abstract

Background: The pharmaceutical industry has long relied on innovation to bring respectability to medicine and drive revenue. In today's marketplace, organizations are under increasing stress from two forces: fierce global competition and societal pressure for sustainable business practices. This empirical research wants to examine the impact of organizational innovation on the three pillars of sustainability in the Jordanian pharmaceutical context while ensuring a move beyond the traditional models that depict innovation as simply related to economic performance.

Methods: his study uses a descriptive-analytical quantitative approach; a structured questionnaire which was designed according to previous literature and underpinned by the Oslo Manual, was electronically distributed to a selected sample of upper - and middle-level managers in Jordanian pharmaceutical firms. From this population (287 managers), we collected 225 valid responses and analyzed them. The independent variable was organizational innovation (depicted through product and process innovation dimensions). The dependent variable was sustainability (represented in terms of the economic, social, and environmental dimensions). Data analysis was performed using SPSS, and incorporated descriptive statistics and multiple regression analysis to test the null hypotheses of the study.

Discussion: The results affirm a strong positive correlation between organizational innovation and sustainability, meaning we rejected all nulls. An important finding was the particularly strong impact on overall sustainability of process innovation, even when its total effect was only slightly greater than product innovation. This suggests that while new products create economic and social value, a process innovation - for example, in manufacturing, quality control and logistics - can lead to simultaneously direct benefits for the organization and the triple bottom line - economic (cost reduction), social (worker safety), and environmental (waste reduction). Thus, the results suggest managers are leveraging process innovation actions as not only a way to improve efficiencies of a firm, but as a strategic way to improve sustainable performance in a manner whereby it does not compromise operational efficiencies.

Conclusion: In conclusion, organizational innovation acts as a strategic lever for achieving organizational sustainability in the pharmaceutical context. The new innovation paradigms that embrace corporate sustainability realize that a sound approach to innovation given the current landscape is an integrated strategy - that is, the development of new products and faster processes is intentionally aligned with the triple bottom line. This study provides an empirical study bridge between innovation management and corporate sustainability activities, giving managers actionable points to strive for more resilient and responsible organizations and forwarding a research agenda that studies this important intersection.

Keywords: Organizational Innovation, Product Innovation, Process Innovation, Sustainability, Null Hypothesis, Pharmaceutical Companies, Jordan.

1. Introduction

The pharmaceutical industry is in a position of challenges in the current wellbeing of the global economy. It has to deal with increased competition, regulatory pressures, accelerating technology, and pressure from stakeholders to be socially and environmentally responsible (Lam, 2004). In this ever-changing environment, the act of innovating is a necessity for survival and growth - not just a choice. Traditionally, innovation in this sector has simply meant new drugs (product innovation). However, the competition faced today implies a much broader definition of innovation, which includes not only the drugs, but also the ways those drugs are discovered, manufactured, and delivered (process innovation). And these two concepts form the basis for organizational innovation (Damanpour, 2014).

At the same time, the idea of sustainability has moved from being a specialty to a pillar of corporate strategy. Encumbered by investor demands, consumer awareness, and

global challenges such as climate change, companies are no longer evaluated based solely on returns (economic) but also their performance and impact on society (social sustainability) and the planet (environmental sustainability). This tripple-bottom-line strategy is particularly applicable to the pharmaceutical industry, which develops products with a direct and indirect impact on human health and consumes a number of natural resources.

The Jordanian pharmaceutical industry is an important sector as an essential contributor to the national economy, a quality producer, and an important international export market. The fundamental challenge for these companies, and the central issue of this study, is understanding the exact relationship between their innovation projects (processes, product development, technological advancement, etc.) and their sustainability performance. This study aims to answer this challenge by examining innovation for sustainability from the perspective of the top and middle management in Jordan Pharmaceutical companies.

2. Literature Review

Organizational Innovation

Organizational innovation involves creating a product, process, marketing method, or organizational method that is new or significantly improved compared to practices utilized in businesses (OECD, 2005). As a concept that encapsulates both changes that are new to the organization, in order to improve the operation of the organization (Lam, 2004), for this research organizational innovation is conceptualized through its two main dimensions:

• Product Innovation: This dimension is concerned with creating a good or service that is new or significantly advanced. In the pharmaceutical industry, this means new active ingredients, innovative delivery systems, new formulations, new diagnostic tools, and is a major source of growth, and competitive advantage (Ahlstrom, 2010).

• Process Innovation: This dimension refers to implementing a new or significantly improved production or delivery method. In pharmaceuticals, this is illustrated through lean manufacturing, "green chemistry," as a method to reduce hazardous byproducts, automated/robotic quality control, and digitalization of the supply chain (Alves et al., 2018).

Sustainability

Sustainability means fulfilling needs of current stakeholders without compromising future generations ability to fulfill their own needs. Sustainability is conceptualized by three interrelated pillars (Rahman et al., 2022):

• Economic Sustainability: Economic sustainability refers to an organization's ability to maintain profit and financial viability in the long run. Economic sustainability encompasses resource management, risk management, and business continuity.

• Social Sustainability: Social sustainability involves the stakeholders of a company, such as employees, customers, and the community. Social sustainability includes fair wages, product accessibility and safety, and ethical treatment.

• Environmental Sustainability: Environmental Sustainability is a company's responsibility to minimize harm to the environment. This includes: reducing consumption, waste, and air/water quality, and materials sourcing (Purvis et al., 2019).

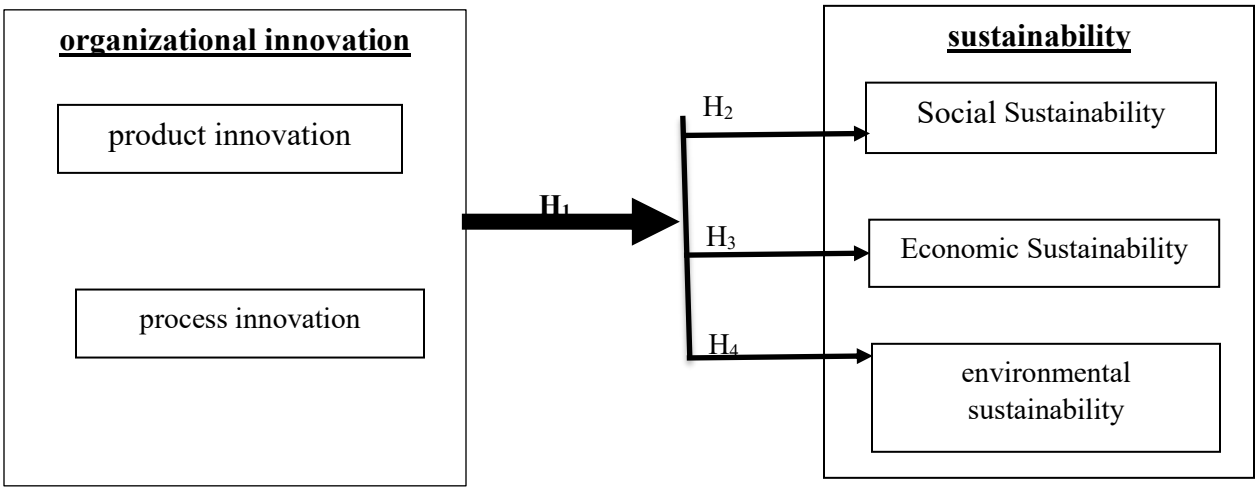
3. Study Hypotheses and Model

Based on the theoretical framework, the following hypotheses were formulated in the **null form**, which will be statistically tested for rejection:

- **H01:** There is **no** statistically significant impact at ($\alpha \leq 0.05$) of organizational innovation by its dimensions (product innovation, process innovation) on overall sustainability in Jordanian pharmaceutical companies.
- **H02:** There is **no** statistically significant impact at ($\alpha \leq 0.05$) of organizational innovation on economic sustainability in Jordanian pharmaceutical companies.
- **H03:** There is **no** statistically significant impact at ($\alpha \leq 0.05$) of organizational innovation on social sustainability in Jordanian pharmaceutical companies.
- **H04:** There is **no** statistically significant impact at ($\alpha \leq 0.05$) of organizational innovation on environmental sustainability in Jordanian pharmaceutical companies.

The researchers designed the study model based on the above hypotheses, as shown in Figure 1.

Figure 1 :Study Model



4. Methodology

Study Population and Sample The study population is all 287 top and middle managers in Jordanian pharmaceutical companies. The sample of 236 managers was obtained by using a simple random sampling technique. A total of 236 questionnaires were distributed, of which 225 were returned and deemed valid for analysis (Response Rate = 95.3%).

Study Instrument A questionnaire was developed to collect information. Questions were divided into three parts: demographic data, organizational innovation (product and process), and sustainability (economic, social, environmental). All questions utilized a 5-point Likert-type scale. The questionnaire was assessed by academic experts for validity, and reliability was assessed using Cronbach's Alpha, all of which were above the recommended threshold (+.70).

5. **Descriptive Analysis and Reliability** The overall Cronbach's Alpha for the instrument was 0.965, indicating excellent reliability.

Table 1 shows that the overall level of organizational innovation was high (Mean = 4.28), and the overall level of sustainability was also high (Mean = 4.22).

Table 1: Descriptive Analysis and Reliability Results

Variable / Dimension	Items	Cronbach's Alpha	Mean	Std. Deviation
Organizational Innovation (Overall)	12	0.941	4.28	0.58
Product Innovation	6	0.895	4.21	0.64
Process Innovation	6	0.912	4.35	0.61
Sustainability (Overall)	15	0.953	4.22	0.55
Economic Sustainability	5	0.887	4.38	0.60
Social Sustainability	5	0.901	4.20	0.66
Environmental Sustainability	5	0.924	4.08	0.71

The study instrument, as stated above, was first analyzed for reliability to assess the internal consistency of the measures. The overall Cronbach's Alpha for the instrument was 0.965, and all dimensions had alphas ranging from 0.887 to 0.953, indicating the measures were reliable and consistent. The descriptive analysis, as indicated in Table 1, shows a very high perceived level of Organizational Innovation, with an overall average (mean) level of 4.28. The further analysis of its dimensions indicates that Process Innovation (Mean = 4.35) is being perceived slightly higher than Product Innovation (Mean = 4.21), suggesting a strong strategic focus on operational excellence, quality control, and efficiency, which are vital elements in the highly regulated pharmaceutical industry. Similarly, Sustainability is being perceived at a high level, with an overall average (mean) level of 4.22. The analysis of its dimensions suggests a clear insight into corporate priorities, with Economic Sustainability ranked the highest at Mean = 4.38, followed by Social Sustainability (Mean = 4.20), and lastly Environmental Sustainability (Mean = 4.08). This logical hierarchy makes clear that financial viability is the most important, then the social mission of the industry, and then environmental performance, although still strong, is seen as an area to more strategically emphasize. Moreover, the low standard deviation scores in all dimensions (from 0.55 to 0.71) indicate strong agreement amongst the respondents to add credibility to the mean scores and suggest similar experiences around these practices amongst the management cohort. In summary.

Table 2: Hypothesis Testing Results

Hypothesis	Model Summary (R / R^2)	ANOVA (F / Sig.)	Coefficient (β / T / Sig.)	Result

H01: Impact of OI dimensions on Sustainability	**R = 0 .868, R^2 =0. 753**	**F=341.2, Sig=.000**		**Rejected**
			Product Innovation: β=.385, T=6.98, Sig=.000	
			Process Innovation: β=.512, T=9.25, Sig=.000	
H02: Impact of OI on Economic Sustainability	R=.789, R^2=.622	F = 367.1, Sig = .000	β=.789, T=19.16, Sig=.000	**Rejected**
H03: Impact of OI on Social Sustainability	R=.755, R^2=.570	F = 295.4, Sig = 0 .000	β=.755, T=17.18, Sig=.000	**Rejected**
H04: Impact of OI on Environmental Sustainability	R=.810, R^2=.656	F = 426.3, Sig= 0.000	β=.810, T=20.64, Sig=.000	**Rejected**

For H01: The multiple regression results indicate a significance level (Sig. = .000) less than the .05 benchmark. The null hypothesis H01 is therefore rejected. This shows that the dimensions of organizational innovation are statistically significantly related to overall sustainability. The R^2 value of .753 indicates that product and process innovation accounts for 75.3% of the variance in sustainability.

For H02, H03, and H04: The simple regression results indicate a significance level .000 for all three models. The significance is less than .05. We reject the null hypotheses H02, H03 and H04. This confirms there is a significant positive contribution of organizational innovation on economic sustainability, social sustainability, and environmental sustainability respectively.

6. Discussion

The results offer strong support that organizational innovation is a strong generator of sustainability in the Jordanian pharmaceutical industry.

First, the descriptive statistics suggest that managers regard their businesses as very innovative and sustainable. The only marginally greater mean rating for process innovation indicates strong emphasis on internal excellence and efficiency. It is not surprising that economic sustainability ranks as most important as financial sustainability is fundamental. The high score on social sustainability is appropriate given the business of public health. Second, the rejection of the major null hypothesis (H01)

provides substantial statistical evidence for the main argument of this research- that there is an association between organizational innovation and corporate sustainability.

The finding that the two drivers of innovation, product, and process are significant is noteworthy. It suggests that product innovation leads directly to both social and economic sustainability. Process innovation is slightly more significant probably because the overall improvement to organizational efficiency, waste reduction, and safety has separate benefits to all three aspects of sustainability. Third, the rejection of null hypotheses pertaining to the sub-hypotheses (H02, H03, H04) more fully dissects the relationship.

The rejection of H02 confirms the logical link between innovation and economic sustainability. When organisations create new products, they create revenue; when they create new processes they create efficiencies and lower their costs.

• The rejection of H03 confirms the link to social sustainability, in which new drugs improve public health, and the new processes create quality products for consumers while improving the organisation's workforce wellbeing.

• The rejection of H04 confirming the strong link to environmental sustainability, is interesting. It suggests an organisational shift from where managers see environmental compliance only as a cost, to seeing innovation as a way of achieving, efficiency and competitive advantage in both green and sustainable development.

7. Recommendations

The study provided the following recommendations:

• Make an Integrated Innovation and Sustainability Strategy: Management should plan for sustainability at the beginning of the innovation process

• Utilize Process Innovations for Sustainability Opportunities: Firms need to strategically put their investment energy toward process innovations, specifically, green chemistry, water recycling, and digital technology that decreased environmental impacts

• Assess the Sustainability Factors in Product R&D: R&D should be attuned to lifecycle impacts of new products as this is fertile ground for developing "sustainable pharmaceuticals"

• Build an Organizational Culture of Support: Top management should ensure an aligned culture where employees are encouraged, and rewarded for being innovative in support of both commercial and sustainability goals

• Develop Reporting and Metrics: Firms should outline metrics that will assist in keeping track of sustainability outcomes from innovation efforts

• Future Research: Subsequent research may wish to look at larger organizations, or other moderating factors affecting this relationship such as a greater regulatory environment.

8. Contribution

The study makes an important contribution by providing empirical evidence to support the connection between organizational innovation and the triple bottom line of sustainability in the context of the Jordanian pharmaceutical industry. Additionally, it is a more well-rounded study, providing a more complete understanding of innovation by differentiating between product and process. Furthermore, the study provided practical knowledge that is built upon evidence-based learning. Managers should learn how to employ innovation for more than just making a profit, but also for creating resilient, responsible, and sustainable companies.

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