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# Analyzing the Impact of Green Information System on Environmental Sustainability

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**Abstract:** The study aimed to identify the impact of green information system in environmental sustainability, and the diagnosis of a mediator role of the green supply chain in enhancing this effect, the study population consisted of all Jordanian pharmaceutical industry companies, it has been the development ofa questionnaire as a tool to collect data of the study was distribution of (96) questionnaire on the sampling unit, redeem them (92) have been eliminated (3) question naires are not valid for the analysis process, bringing the number of valid question naires for analysis process (89) by (92.7%). The recommendations of the study: is the need for manager's to understand the nature and the level of importance of environmental sustainability that should distinguish them to deal with the environment a strategic perspective.

**Key words:** Green information system, environmental sustainability, greensupply chain, perspective, Jordan

## INTRODUCTION

Environmental sustainability requires consideration to economic performance and social performance, as the environmental degradation poses many risks, the environmental issues are a major concern for industrial organizations and has led to the emergence of new strategies for the management of supply and attention to environmental sustainability because of the social, political and legislative pressures.

Studies recently have focused on the area of environmental sustainability and the best methods to maintain environmental sustainability. Consistent with this trend it has been done in this study which tested the role of green information system to enhance environmental sustainability through the presence of green supply chain.

According to Meacham *et al.* (2013) and Boudreau *et al.* (2008) the green information system and their role in enhance environmental sustainability did not reach the level of development as it should be. Due to the lack of studies on this aspect, especially in the Arab environment, this study, which was conducted empirically in the Jordanian industrial organizations, aimed to test the impact of green information system to enhance the environmental sustainability of those systems by focusing on environmental concerns.

**Green information system:** Green information system is information system that has been modified and is used to observation environmental practices and outcomes (Esty and Winston, 2009). Green information system are information system that are used to observation operations to protect environmental sustainability (Boudreau *et al.*, 2008).

Represents the backbone of green information system of environmental management efforts through the support of the company internal environmental and to meet the reporting on the impact of the exchange of information needs of different stakeholders (Gayar and Fritz, 2006).

Green information systemsupply the necessary to make decisions on eco-design information, in conditions of materials and energy consuming, reuse, recycling and material retrieval and disposal and the proportion of scrap (Meacham *et al.*, 2013). The exchange of information, through the use of green information system, a key aide to supply chain in conditionsof integration and coordination (Chandra *et al.*, 2007).

Moreover, the availability of green information motivates customers on green options as well as help managers develop the process of decision-making related to environmental sustainability and support for renewable energy generation (Esty and Winston, 2009).

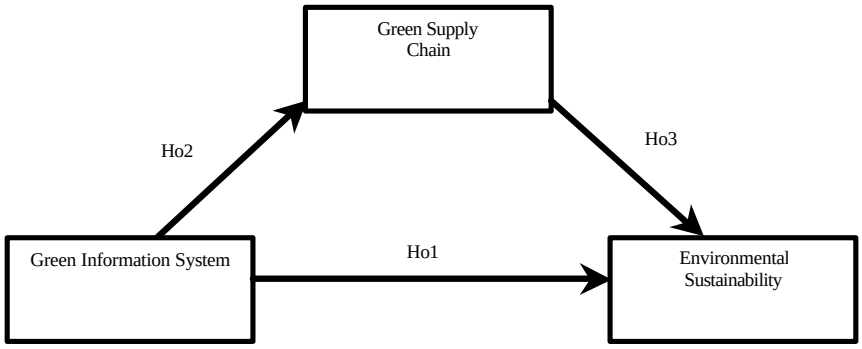


Fig. 1: Researc hmodel with hypothesis

**Environmental sustainability:** Environmental sustainability is defined as a measure to reduce the emissions of substances that reduce the environmental impacts from business organizations. It also helps to enhance the efficiency and synergy between business partners and helps to strengthen the presence of the environment, reduce waste and achieve cost savings. Researchers have shown that the management practices of green supply chain enhance environmental sustainability in organizations. Many manufacturers implementing green practices outside the floor of the shop to meet green commitments it becomes necessary to check the impact of supply chain engines on the practices ofgreensupply chain and the influence of causal environmental sustainability.

The adoption of environmental sustainability as a strategic necessity requires organizations to design and implement green information system. Strategic focus on green supply chain there is a need to observation industrialization, procurement and sales processes to protect environmental sustainability (Preuss, 2002).

And related environmental sustainability ability of plants to reduce air pollution, effluents, solid waste, in addition, it focuses on the plant's ability to reduce the consuming of dangerous and toxic materials and low recurrence environment-related incidents (Zhu *et al*., 2008).

Success depends on the implementation of the improvement of the environment on the ability of information systems in the organization to capture data on environmental sustainability efforts and results of the manufacturing of the organization and the purchase, sale and logistics programs (Bryce, 2002).

**Green supply chain:** Green supply chain can be defined as the management of raw materials and spare parts/ components and processes from supplier's manufacturer's customers and products back with improvements to the environmental impacts through the stages of the life cycle (Hu and Hsu, 2010).

Sarkis (2003) also known as green supply chain by adding an element of green supply chain and therefore it involves the processing of influence and relationships to manage the supply chain of the natural environment. Considers that the environmental impacts of all the supply chain from raw material extraction operations to the final disposal of the goods. With this integration and management practices to green the supply chain is seeking to achieve a miniature waste, a micro-environmental impact while ensuring consumer satisfaction to the fullest extent, good profit.

**Study problem:** The study several aspects of the problemabout Green information system, in Jordanian pharmaceutical companies listed on the Amman Stock Exchange. It would be worth examining the normal impact of Green information system on Environmental sustainability. Other questions include:

- To what extent is the level of Environmental sustainability in Jordanian pharmaceutical companies
- Is there any relationship between Green information system and Environmental sustainability
- Is there any relationship between Green information system and green supply chain
- Is there any relationship between green supply chain and Environmental sustainability

**Study objectives:** The general objective of this study is determining the impact of Green information system of the Jordanian pharmaceutical companies. The specific objectives are two-folds, namely to investigation the direct impact of Green information system on Environmental sustainability and to investigation the indirect impact of Green information system on Environmental sustainability.

**Research model:** Represents Fig. 1, the research assumptions and model study to test the effect of mediator of green supply chain. It is necessary to link the

green information system with environmental sustainability ($Ho_1$) and then insert the green supply chain and mediator variable through the establishment of link between the green of information system and green supply chain ($Ho_2$) and the existence of linking green supply chain and environmental sustainability ($Ho_3$).

**Hypotheses:**

- $H_{o\ 1}$: There is a negative relationship between green information systemand environmental sustainability
- $H_{o2}$: There is a negative relationship between green information systemandgreen supply chain
- $H_{o3}$: There is a negative relationship between green supply chain andenvironmental sustainability
- $H_{o4}$: Green supply chain mediator variable between green information system and environmental sustainability

## MATERIALS AND METHODS

**Population and sample:** The study population consisted of all Jordanian pharmaceutical industry companies listed on the Amman Stock Exchange for 2016 of (6) companies which represented the study population. As the study sample was of managers working in the Jordanian pharmaceutical industry companies listed on the Amman Stock Exchange.

The distribution of (96) to identify the study sample, recovered, including a total of (92) and after examining questionnaires recovered show that there are (3) questionnaires are not valid for the analysis process, thus bringing the number of valid questionnaires for analysis (89) questionnaire at a rate (92.7% ) of the total number of distributed questionnaires.

**Data collection:** The data and information was gathered from two resources:

**Secondary resources:** The processing theoretical frameworks for the study through secondary data sources, which is in the books and references relevant, periodicals, articles and reports and research and previous studies and research on Internet sites.

**Primary resources:** To address the analytical framework, has been relying on the development of a questionnaire major tool for the study, which included a number of statements reflect the objectives of the study and questions, to be answered by the study sample.

**Instrument validity and reliability**

**Instrument validity:** For the purposes of validated measurement tool has been the use of experts in the field of administrative sciences.

Table 1: Reliability analysis

| Variables | Value (α) |
|---|---|
| Green information systems | 0.83 |
| Green supply chain | 0.86 |
| Environmental sustainability | 0.88 |

**Instrument reliability:** To verify the stability of the questionnaire was conducted to test the internal consistency of the paragraphs of measure, by using Cronbach Alpha. And although the measurement bases in the duty value obtained is specific, however, get a (Alpha = 0.70) is one of the Applied human Sciences is acceptable in general (Sekaran and Bougie, 2010). The Table 1 shows the results of stability tool for this study.

## RESULTS AND DISCUSSION

**Structural equation model results:** Represents Table 2 statistics intermediate results summary. All variables with normal distribution with a Skewness and kurtosis coefficients which is in the range-2.00 and 2.00 and are presented positive correlations coefficients which is statistically significant at the 0.01 level for all variables.

Hypotheses $H_{01}$-$H_{03}$ supports positively green information system linked with a positive environmental sustainability with a coefficient of 0.19 and the value of t (2.51) and green informationsystem are linked positively with green supply chain by a factor of 0.59 and the value of t (7.73). And achieve the green supply chain positive correlation with the environmental sustainability with a coefficient of 0.58 and the value of t (7.01).

Determine the impact of the mediator variable green supply chain ($H_{04}$) requires calculating the indirect effect of green information system on environmental sustainability through the green supply chain.

When it explains a large part of the link between the independent variable and the dependent variable. Indirect impact (0.32) is the results of standardized coefficients linking green information system and green supply chain (0.59) and green supply chain and environmental sustainability (0.58).

When the two paths is a significant a significant at the level of (0.05) will be mostly indirect effect is significant at the level of significant (0.05) (Fig. 2).

Combine green information system and green supply chain to positively impact on environmental sustainability. Indirect effect of green information system on environmental sustainability is a partial but significant mediator by the green supply chain. Before the preface of the green supply chain in the models and the standard transactions for green information system to link environmental sustainability (0.59).

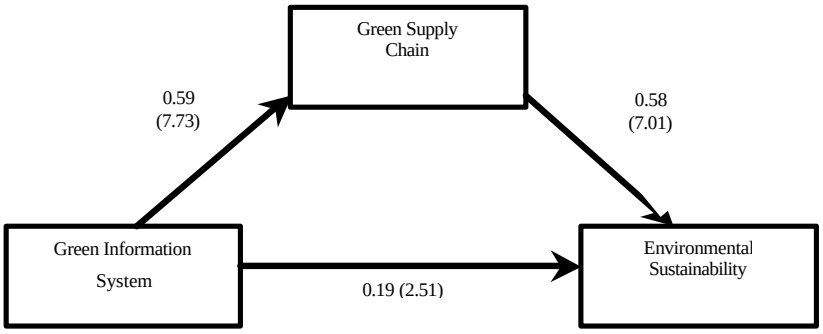


Fig. 2: Presents the results of the analysis of structural equation model with standardized coefficients and (t-value); RMSEA = 0.98; NNFI = 0.959; CEI = 0.955; SRMR = 0.039

Table 2: Correlations analysis

| Variable | Mean | SD | Skeeness | Kurtosis | GIS | GSC |
|---|---|---|---|---|---|---|
| GIS | 3.880 | 0.579 | -0.730 | 0.432 | | |
| GSC | 4.130 | 0.410 | -0.370 | 0.987 | 0.341** | |
| EP | 3.825 | 0.688 | -0.556 | 0.255 | 0.906** | 0.306** |

Green Information System (GIS), Green Supply Chine (GSC); Environmental sustainability (EP), ** Correlations significant at 0.01 Level; (2-tailed)

The introduction of green supply chain as a variable mediator reduces the coefficient of 0.59-0.19 because the coefficient (0.19) is still a significantly. Green supply chain serving the construction and partial mediator (0.19) and it is recalled that the indirect impact (0.32) is stronger than the direct impact. It believes that this result is the first pilot, which focuses on the important role of green information system in achieving environmental sustainability.

## CONCLUSION

The study reached several conclusions, including: concluded the results of the study to the a positive correlation between green information system and environmental sustainability and results showed the presence of the impact of a statistically significant green supply chain mediator variable in enhancing the link between green information system and environmental sustainability.

## RECOMMENDATIONS

The need for manager's working in Jordanian pharmaceutical industry companies to understand the nature and the level of importance of environmental sustainability that should distinguish them to deal with the environment a strategic perspective Adopt foreseeing future scenarios approach from Jordanian pharmaceutical industry companies to achieve environmental sustainability

## SUGGESTIONS

This study was directed towards Jordanian pharmaceutical industry companies. Further empirical work is needed to test the degree to which the findings can be generalized to other industries. This study was conducted on Jordanian Companies. Generalizing Jordanian results to other countries is questionable. Therefore, we recommend carrying out such study in different countries especially Arab countries.

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