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Promoting organizational sustainability and innovation: An exploratory case study from the Egyptian chemical industry

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Abstract

The concept of organizational sustainability is a trending interest in both industry and academia. As with innovation, the business environment is still not well adapted to adopt these concepts. This paper focuses on developing a theoretical business model for organizational sustainability that takes into consideration the environmental, economic, and social issues. An exploratory study was designed for a case study from the Egyptian chemical industry to recognize the relation between innovation and organizational sustainability, and their willingness to adopt these concepts. The findings of the study provide insights and suggestions for the organization to implement innovation and organizational sustainability.

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1. Introduction

In recent years, the Egyptian industrial sector has been confronted with many challenges, such as financial constraints due to inflation, Egyptian Pound deflation, energy shortage, increased competition in the Middle East and North Africa (MENA) region, and introduction of new technologies. With all these challenges, companies are striving to survive and achieve economies of scale. In addition to the traditional business imperatives such as cost reduction, value increase, and quality improvement; an increasing number of organizations are now trying to integrate sustainability in their decision-making processes. Incorporating organizational sustainability in the business environment incurs taking into consideration the so-called Triple Bottom-Line (TBL) that incorporates environmental, economic, and social performance indicators into the management activities and evaluation processes [1].

Innovation is a key driver in the success of deploying organizational sustainability [2]. By equating sustainability with innovation, organizations can put the basis of their leadership and power in front of their competitors [3]. That means that organizations should not rely only on their internal development of new products and services, they need to encourage innovation across their boundaries and along their supply chains and other sources like universities and research centers. To achieve this, organizations need to develop a culture of sustainability by articulating values and policies that consider the TBL as a dominant idea and establish a link with the organizational objectives and vision.

The integration of organizational sustainability and innovation can protect the assets of the organization and stimulate the creation better goods and services that meet customers' needs, which make organizational sustainability a strategic choice in that sense. Organizations now seek national and international recognition by adopting sustainability policies, especially with the increasing number of sustainability indices, such as the Dow Jones sustainability index [4]. A study in 2011 showed that 80% of Global Fortune 250 companies in the United States were reporting externally on their sustainability initiatives [5]. However, there is a lack in the theoretical models and case studies on organizational sustainability and its relation with innovation.

The objective of this paper is to investigate the relation between organizational sustainability and innovation and their practice in a large chemicals manufacturer in Egypt and how can these concepts be embedded in the strategy of the enterprise. The remainder of this paper is organized as follows: Section 2 gives key concepts about organizational sustainability and innovation. Section 3 gives a theoretical model and the research methodology followed in this work. Section 4 describes the case study, and then the findings are elaborated in Section 5. Finally, conclusions and future work are given in Section 6.

2. Key concepts

Organizations are systems operating under conditions of dynamic variables, risks, and uncertainties [6]. The objective of sustainable development is to meet the needs of the present generation in ways that are economically viable, environmentally adequate, and socially equitable without compromising the ability of future generations to do the same [7]. However, technological advances force organizations to change; management policies should be highly responsive to the dynamics of the market, environment, regulations, and technology, to transfer sustainable-based actions and innovations into achievable mindset and practice to promote organizational sustainability. In that sense, organizational sustainability can be defined as the organization's ability to achieve its objectives and increase its long-term values by integrating environmental, economic, and social considerations into its strategies. In [8], after interviewing 50 CEOs and surveying 766 other CEOs of several companies around the world, it was found that 93% of the CEOs believe that sustainability is essential for the future success of their organizations. The awareness about sustainability was high in Latin America, Africa, North America, and Asia, moderate in Europe, and very low in the MENA region. According to the TBL concept, the organization needs to move from a thin (single)-dimension strategy that considers only the economic aspect to a thick (three)-dimension strategy that considers the three aforementioned aspects.

From the understanding of the report by the World Economic Forum [9], it takes four levels to build a sustainable system in an organization:

- Level 1: the change starts from the top; the mindset of the top management should be changed to support the shift towards organizational sustainability and producing general statements and plans.

- Level 2: sustainability principles and concepts should be embedded into the core and the attitude of the organization's mission and objectives. In this level, innovative improvements should be made to the products and processes development.
- Level 3: new value chains should be built to promote sustainable collaboration across all the players; stakeholders, suppliers, customers, and talent pools.
- Level 4: gradual systematic changes should take place to shape not only organizations and small societies, but also the global economic, social, and environmental systems.

Since organizational sustainability is an emerging research area, relatively few works were published on it. Nidumolu et al. [3] argued that sustainable development is the only way for organizations to grow, reduce costs, and maximize revenues from innovative products and/or business expansion. Stubbs and Cocklin [10] stated that social and environmental priorities must be added to the current business models to achieve organizational sustainability, not only seeking the economic profit. Carayannis and Campbell [11] developed an inter-disciplinary and trans-disciplinary frameworks of analysis for sustainable development in which three or four players are involved; universities, industry, government, and civil society organizations. Hall and Wagner [12] discussed how embedding sustainability aspects into the business model of an organization can create competitive advantages. They argued that models based on cross-functional problem solving perform better than those using a modular approach. Terouhid and Ries [13] developed a decision making model that uses the European Foundation for Quality Management Excellence model (EFQM EM) and system dynamics for the assessment of sustainability excellence in construction organizations. He found that the main organizational capabilities required in these organizations to shift towards sustainability are leadership, strategy, people, partnership, and process. Moldavanova and Goerdel [14] presented a conceptual framework of the organizational social connection and how particular strategies can increase the organizational sustainability in the long run. Beiler [15] tried to assess organizational sustainability within transportation planning by investigating the existing collaboration between Metropolitan Planning Organizations (MPOs), Rural Planning Organizations (RPOs), and non-designated areas through a case study on Pennsylvania. The results were evaluated by using organizational network analysis. Joyce [16] discussed the impact of organizational sustainability on Small- and Medium- sized Enterprises (SMEs), He used the TBL business model to generate more sustainable concepts. He used a co-creation process and design thinking to develop viable solutions and build foresight visions. Lopes et al. [17] analyzed the interplay between organizational sustainability, knowledge management, and open innovation and the impact on the organizational culture.

3. Theoretical business model and research methodology

In this work, exploratory design will be used since the current research problem is recent with no well-established theoretical models related to it. To perform this exploratory design, the guidelines for case study research by Yin [18] are followed. For this end, the research questions of this work can be stated as follows:

- *How do organizational sustainability and innovation interact with each other?*
- *How much would a large-sized Egyptian enterprise be willing to adopt these new strategies?*

Fig. 1 gives a suggested organizational chart for organizational sustainability and Fig.2 proposes an organizational sustainability assessment framework.

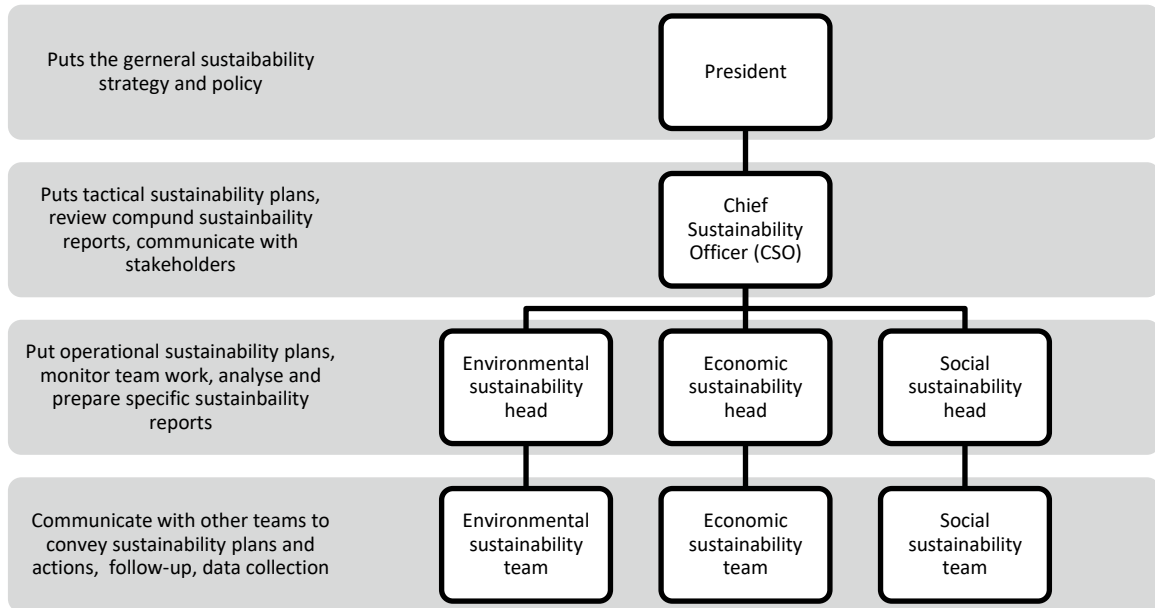


Fig. 1 organizational chart for organizational sustainability

Data collection and analysis follows the four steps of Wacker [19] for theory building by using case studies; development of definitions, domain limitation from the case study, relationship building, and theory predictions. Focus group was selected as our exploratory research method; it helps to get detailed information. The open and natural discussion style of focus groups allows for a wider variety of perspectives and opinions in a shorter period of time compared to individual interviews.

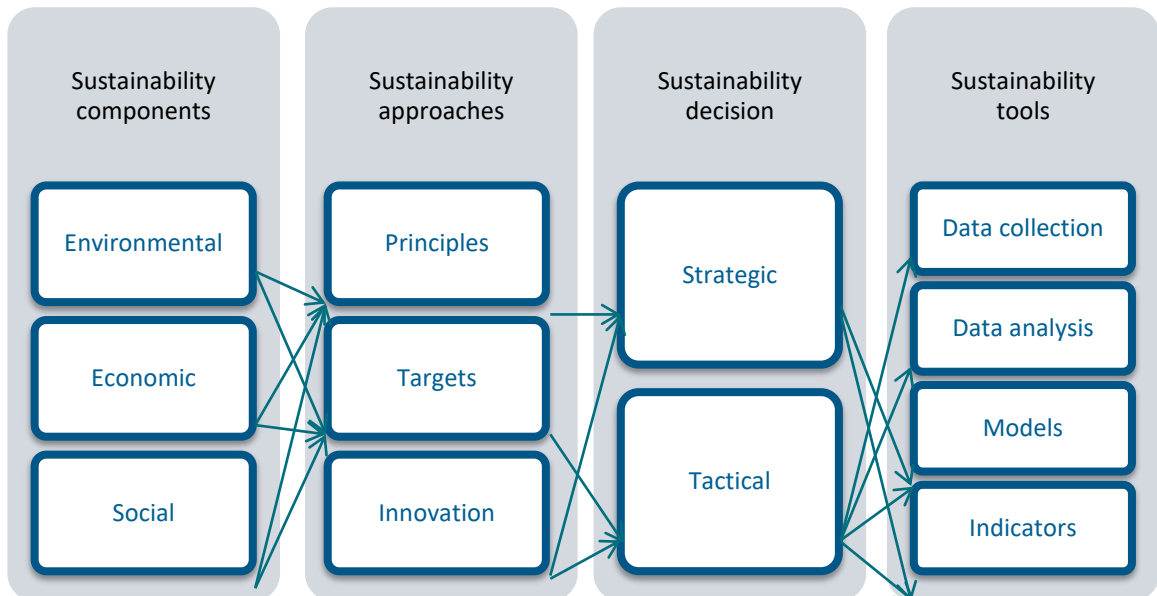


Fig. 2 Organizational sustainability assessment framework

4. Case study

An Egyptian chemical organization with 31 years of experience in the sector of detergents and cosmetics was selected as a case study for this work. The organization was proven to be one of the fastest growing FMCG companies in Egypt and MENA region. Over the years, the organization succeeded to establish a responsible and successful partnership with suppliers and customers along the supply chain. Few years ago, the organization started to change their business vision by adopting environmental sustainability measures. However, it still lacks the other aspects of organizational sustainability and innovation approaches.

The main author made several visits to the company, these visits involved interviews, observation, conversations, and viewing of some presentations and documents, to have a broad view of the organization's history, products, structure, and activities. Six focus groups were formed and conducted; each group contained 10 people ranging from top management to human resources employees to ensure a comprehensive debate with opposite opinions. 30% of the participants are top and senior-level managers, 57% are mid-level managers and section heads, and 13% are junior-level staff, this comes in line with the research focus on the strategic and tactical decision-making for organizational sustainability. 42% of the participants have more than fifteen years of experience, 34% have more than seven years of experience, and 15% have more than three years of experience.

The funnel approach to questioning was followed to design for the focus groups, starting with open-ended questions then narrowing towards closed-ended questions [20]. Table 1 gives the guidelines that were used to steer the discussion and formulate the questions and their relationship with the assessment framework given in Fig. 2. After collecting data from the focus group, the data is validated through further one-to-one interviews. Qualitative content analysis is used to analyze the collected data [21]. Qualitative content analysis is a research method that uses systematic and objective methods to describe and quantify some phenomenon. It also allows the researcher to test his research hypothesis for better understanding of the data. Four steps are followed; fitting the data into a model of communication, putting rules for data analysis, establishing feedback loops, and stating criteria of reliability and validity.

Table 1: Organizational sustainability topics for focus groups discussion

Guideline for topics for focus groups	Sustainability component	Sustainability approach	Sustainability decision
The company is innovation-oriented for product development and processes improvement	Economic	Innovation	Strategic
Employees can express their opinions	Social	Principles	Strategic
There is effective communication within the company	Social	Target	Tactical
Employees are aware of the policies and objectives of the company	Social	Principles	Strategic
Employees are aware of the challenges facing the chemical industry	Social	Principles	Tactical
Employees understand the importance and methodology of innovation	Social	Innovation	Strategic
Employees are aware of environmental sustainability	Environmental	Principles	Strategic
The company has main drivers for addressing environmental sustainability	Environmental	Target	Tactical
The company has main drivers for addressing economic sustainability	Economic	Target	Tactical
The company has main drivers for addressing social sustainability	Social	Target	Tactical
There are practices to reduce the negative impacts on environmental sustainability	Environmental	Target	Tactical
There exists knowledge sharing between the partners along the supply chain	Economic	Principles	Tactical
The degree of innovation contribution to knowledge generation	Social	Innovation	Strategic
Organizational culture is clear and well-defined	Social	Principles	Strategic
Organizational sustainability indicators are clear and well-defined	Social	Principles	Strategic
External society and government is propitious for adopting organizational sustainability	Social	Principles	Strategic
Innovation is linked to the sustainability issues in chemical industry	Economic	Innovation	Tactical
Innovation is linked to the strategic plan of the company	Economic	Innovation	Strategic

5. Findings

After finalizing the data collection and analysis stages, the findings of this study were used to derive sample indicators that can be used for adopting organizational sustainability in the company. Table 2 shows these indicators for organizational sustainability:

Table 2: Organizational sustainability indicators

Category	Indicator
General	Key Performance Indicators (KPIs)
	Individual indicators
	Level of TBL involvement in strategic plans
	Level of policy communication internally and externally
	Value network contribution
Environmental	Intensity of emissions (CO ₂ , greenhouse gas)
	Waste generation intensities (solid, hazardous, etc.)
	Material Flow Analysis (MFA)
	Waste water treatment rates
	Energy consumption rates (water, electricity, etc.)
	Eco-efficiency ratio
	Impact on biodiversity
	Life Cycle Assessment (LCA)
	Environmental agreements through the supply chain
	Sustainability reporting
	Renewable energy usage rate
	Recycling rate
	Number of environmental training activities
	Usage of eco-friendly infrastructure
	Rate of fines/environmental violations
Number of green jobs	
Economic	Economic performance indicators
	Rate of uniformity in financial obligations (salaries, benefits, payouts, etc.)
	Number of innovative products or services
	Number of jobs in value-added activities
	Rate of fines/financial violations (taxes, customs, etc.)
	Number and value of loans
	Sales volume
	Existence and efficiency of market monitoring plans
	Existence and efficiency of risk management plans
	Level of customer loyalty and satisfaction
	Percentage of non-value adding activities
Financial feasibility through the supply chain	
Social	Socially Responsible Investing (SRI) index
	Amount of collaboration with universities and research activities
	Number of participations in social/community/charity events
	Ethnic and gender variety in the organization
	Ethnic and gender salary equity in the organization
	Adequacy of salaries compared to other organizations
	Level of employee participation in sustainability activities
	Safety indicators (rates of accidents, deaths, etc.)
	Number of sustainability training activities
	Level of employees loyalty and satisfaction
	Hiring rate
	Number of hired people with special needs, minorities, immigrants, etc.
Rate of fines/labor law violations	

	Usage of information technology for easier communication with customers and suppliers
	Number of complaints/fines related to ethics in marketing or competition
	Number of complaints/fines related to product/service quality

The above indicators provide a basis for the initial assessment of organizational sustainability in the company. After this exploratory research, the research questions presented in Section 3 can be answered as follows:

- ***How do organizational sustainability and innovation interact with each other?***

Results from the focus groups discussions and interviews showed the concentration on eco-innovation for products and processes development with little focus on the economic and social sustainability. They agreed that innovation can accelerate the organizational sustainability by boosting the performance of environmental and economic indicators.

- ***How much would a large-sized Egyptian enterprise be willing to adopt these new strategies?***

From a macro perspective, large companies are central to sustainable development. These companies need to consider regulations in many areas. Although there are increasing efforts by the Egyptian governmental and non-governmental organizations towards more environmental-friendly and sustainability regulations, there are many complaints that the business and social culture in Egypt still puts many hindrances in front of the attempts of applying organizational sustainability. Hence, implementing policies and regulations that force all the companies to consider social and environmental sustainability issues is of great importance, although it may run the risk of being met with strong resistance from some employees and stakeholders or partners.

6. Conclusions and future work

This paper has four contributions; first, to the best of our knowledge this research is the first of its kind to target the promotion of organizational sustainability in the Egyptian industry. Second, it gave a recent literature review on organizational sustainability and innovation. Third, it proposes an organizational chart and an assessment framework for applying organizational sustainability in an organization. Finally, exploratory design was conducted in a large Egyptian chemical company and the findings of this study were used to derive sample indicators that can be used for adopting organizational sustainability in the organization.

However, this case study has some limitations. As it is a single case study, the findings cannot be generalized to other organizations or industries without further studies. Another limitation is related to the current political and economic situation in Egypt after the revolution in 2011. The instability in the business sector, the inflation, and the floating of the Egyptian pound in 2017 are all unusual circumstances that may have affected the opinions and ideas of the participants of this study. Future studies should take into consideration these limitations and try to overcome them.

References

- [1] Milne, M.J., Gray, R. W(h)ither Ecology? The triple bottom line, the global reporting initiative, and corporate sustainability reporting. *J. Bus. Ethics* 2013; 118: 13-29.
- [2] Garcia-Alvarez, M.T. Analysis of the effects of ICTs in knowledge management and innovation: The case of Zara group. *Comput. Hum. Behav.* 2015; 51 (Part B): 994-1002.
- [3] Nidumolu, R., Prahalad, C.K., Ranganwami, M.R. Why sustainability is now the key driver of innovation. *Harvard Bus. Rev.* 2009; 87(9): 56-64.
- [4] Colbert, B., Kurucz, E. Three conceptions of triple bottom line business sustainability and the role for HRM. *Hum. Res. Bus.* 2007; 30: 21-29.
- [5] Wales, T. Organizational sustainability: What is it, and why does it matter? *Rev. Enterp. and Manag. Stud.* 2013; 1(1): 38-49.
- [6] Carayannis, E.G., Sindakis, S. and Walter, C. Business model innovation as lever of organizational sustainability. *J. Technol. Trans.* 2015; 40: 85-104.
- [7] Brundtland, G.H. and World Commission on Environment and Development. *Our common future: Report of the world commission on environment and development.* Oxford University; 1987.

- [8] United Nations Global Compact and Accenture. *A new era of sustainability*; 2010. Available from: <https://archive.epa.gov/wastes/conservation/tools/stewardship/web/pdf/accnture.pdf>
- [9] World Economic Forum and Deloitte Touche Tohmatsu. *Redesigning business value: A roadmap for sustainable consumption*; 2010. Available from: http://www3.weforum.org/docs/WEF_RedisiginingBusinessValue_SustainableConsumption_Report_2010.pdf
- [10] Stubbs, W., Cocklin, C. Conceptualizing a “sustainability business model”. *Org. and Env.* 2008; 21(2): 103-127.
- [11] Carayannis, E.G., Campbell, D.F. Triple helix, quadruple helix and quintuple helix and how do knowledge, innovation and the environment relate to each other? A proposed framework for a trans-disciplinary analysis of sustainable development and social ecology. *Int. J. Soc. Eco. and Sus. Dev.* 2010; 1(1): 41-69.
- [12] Hall, J., Wagner, M. Integrating sustainability into firms’ processes: Performance effects and the moderating role of business models and innovation. *Bus. Strat. and Env.* 2012; 21(3): 183-196.
- [13] Terouhid, S.A., Ries, R. Organizational sustainability excellence of construction firms – a framework. *J. Model. in Manage.* 2016; 11(4): 911-931.
- [14] Moldavanova, A., Goerdel, H.T. Understanding the puzzle of organizational sustainability: toward a conceptual framework of organizational social connectedness and sustainability. *Pub. Manage. Rev.* Published online: March 2017.
- [15] Beiler, M.O. Organizational sustainability in transportation planning: Evaluation of multi-jurisdictional agency collaboration. *J. Transp. Geo.* 2016; 52: 29-37.
- [16] Joyce, A. Co-creation and design thinking to envision more sustainable business models: A foresight design approach for organizational sustainability of SME manufacturers. In: Bellemare J., Carrier S., Nielsen K., Piller F. (eds) *Managing Complexity*. Springer Proceedings in Business and Economics. Springer, Cham; 2017, 173-193.
- [17] Lopes, C.M., Scavarda, A., Hofmeister, L.F., Thome, A.M.T., Vaccaro G.L.R. An analysis of the interplay between organizational sustainability, knowledge management, and open innovation. *J. Clean. Prod.* 2017; 142(1): 476-488.
- [18] Yin, R. *Case study research*. Beverly Hills, CA: Sage Publications; 2009.
- [19] Wacker, J.G. A definition of theory: research guidelines for different theory building research methods in operations management. *J. Op. Manag.* 1998; 16(4): 361-385.
- [20] Rose, D.E. The information seeking funnel. In: Marchionini, G., White, R. (eds.) *National Science Foundation workshop on Information-Seeking Support Systems (ISSS)*, Chapel Hill, NC; 2008.
- [21] White, M.D., Marsh, E.E. Content Analysis: A Flexible Methodology. *Research Methods*, Lynda M.B. (ed.). 2006; 55(1): 22-45.