

Innovation as a lever for business resilience in times of crisis: The case of Morocco's energy sector

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Abstract. Today's businesses are increasingly confronted with uncertainty, unpredictability and environmental complexity, as well as severe, recurrent and consecutive crises. In this context, innovation and resilience are the watchwords. Resilience refers to a company's ability to adapt and recover from shocks and disruptions. Innovation, on the other hand, is the process by which new ideas, products, services or methods are developed, implemented and adopted. Despite the abundance of research on organizational resilience and innovation, very few have addressed the relationship between these two concepts, let alone in the Moroccan context. The objective of this article is to analyze the relationship between these two key concepts and to explore how innovation can be a lever for organizational resilience in times of crisis. To do this, we conducted a qualitative study, through semi-structured interviews with Moroccan companies operating in the energy sector. The main results confirm the existence of a positive correlation between the two concepts. However, innovation alone does not guarantee the exit from the crisis and the resilience of companies. In order to validate and generalize the results obtained, we recommend conducting a confirmatory quantitative study.

Index Terms—innovation, organizational resilience, crisis, Moroccan firms, energy sector.

Introduction

The environment in which companies operate is increasingly complex and uncertain. This is evidenced by the recent Covid-19 crisis, the Russian-Ukrainian conflict and the global climate crisis.

In this context of crisis and adversity, the question of organizational resilience becomes decisive. Designating the ability of an organization to anticipate, resist a threat or return to a state of stability (Hollnagel, 2006 in Altintas and Royer, 2009), the concept of resilience has gained new momentum in recent studies on organizations. However, there is currently no single model explaining the factors determining the resilience of organizations in times of crisis (Aleksandar Aleksic, Miladin Stefanovic, Slavko Arsovski, Danijela Tadi_2013).

The objective of this article is to contribute to a better understanding of organizational resilience by studying the link between it and innovation. Indeed, despite the abundance of work on organizational resilience and innovation, very few have addressed the relationship between these two concepts, let alone in the Moroccan context. From there, the problem to which we wish to provide answers is the following: **In times of crisis, how does innovation strengthen the resilience of Moroccan companies operating in the energy sector?**

Through this study, we pursue a twofold objective: to enrich the theoretical framework with the key concepts of innovation and organizational resilience; and explore the existence of a positive relationship between these two concepts in the Moroccan context.

To do this, we will first try to define innovation and organizational resilience separately. We will then analyse the existence of a positive correlation between these two concepts. Through a qualitative study, we will finally explore how innovation strengthens the organizational resilience of companies operating in the Moroccan energy sector.

This article is structured as follows: the first part presents the methodology adopted. The second presents the results through two sections: conceptual and theoretical framework, and contextualization and empirical results. We will discuss in a third step, the results and the limitations inherent in this research, before presenting, in the last place the conclusion and the references.

Methods

Our research aims to explore and understand how innovation affects the resilience of Moroccan companies in the face of adversity. In order to achieve this goal, we have opted for a qualitative approach. The choice of this method is not fortuitous. It is justified first by the paucity of research on the relationship between innovation and business resilience in the Moroccan context, but also by the variable nature of this relationship from one company to another. According to Yin (1994), qualitative study is an appropriate method when the research question is concerned with the why or how of complex phenomena.

Indeed, the qualitative method contributes to understanding the reality as it is experienced by the population studied, namely Moroccan companies in the energy sector. As such, Wacheux (1996) states that "the implementation of a qualitative research process is above all a desire to understand the why and how of events in concrete situations".

Our study was conducted between March and May 2023 with three (3) Moroccan companies operating in the energy sector and located in the Casablanca-Settat axis. Data collection was carried out through semi-structured interviews with eleven (11) production managers and operations managers within the companies subject to the research. Interviews are conducted at the workplace, according to the schedule agreed with the interviewees and lasting approximately one hour.

With the agreement of the interviewees, the interviews were recorded. They were then transcribed into Word and Excel, word for word, to avoid any risk of interpretation. This step is essential to facilitate data analysis and promote an in-depth understanding of the problem being studied.

Results

1. Conceptual and theoretical framework

1.1. The concept of organizational resilience

Of physical origin, resilience is commonly defined as the property of a "system" (material, individual, organization, society, environment ...) to withstand a serious shock and then bounce back to develop again [1].

Transposed into management sciences from the 1980s [2], it "represents the ability of an organizational system to anticipate and effectively manage risks through the adaptation of its

actions on the system and processes so that the "core" functions are performed in a stable and effective relationship with its environment" [2]. According to (Wildavsky, 1991), resilience refers to "the ability to cope with unforeseen dangers after they have become apparent, learning to bounce back" [3]. In other words, organizational resilience reflects an organization's ability to adapt, recover and thrive in the face of disruptions, crises or unexpected changes in its environment.

In the absence of a single, formalized theoretical framework to explain the phenomenon of resilience (Duchek, 2019; Vogus and Sutcliffe, 2007; Boin and Van Eeten, 2013, Asadzadeh, Kotter, Salehi, and Birkmann, 2017; Rahi, 2019), several authors have focused on the underlying dimensions or capabilities of organizational resilience. These are the ability to **anticipate** unforeseen events and crises, **the ability to react** and finally the **ability to learn** and **adapt**. In this sense, the work of D. Chabaud and L. Bégin (2010) has highlighted three dimensions of organizational resilience [4]:

- a. **The ability to absorb** tensions and preserve operations despite the presence of adversity.
- b. **The ability to bounce back** from an unfortunate event with a system that progresses in absorbing surprises and grows rather than collapses.
- c. **The ability to learn** and **grow** from previous episodes of resilience.

For his part, Rahi (2019) analyzed organizational resilience under two main dimensions: "**awareness**" and "**adaptability**" [5]. Duchek (2020) and Vakilzadeh & Haase (2020) argue that resilience can be differentiated into three stages: **anticipation, reaction and adaptation** [6, 7].

1.2. The innovation concept

The concept of innovation was initially exclusively associated with technology. "It consists of introducing an innovative product or an innovative production process. This technological innovation is made in R&D laboratories and can be measured by the number of patents filed by a company" [8]

Subsequently, it expanded to include other forms of innovation that are not technology-based. It now refers to " the **process** by which **new ideas, concepts, products, services or methods are developed**, implemented and adopted, resulting in a significant improvement or break from the existing one. This includes both technological and non-technological innovations, and may involve organizational, economic, social or cultural changes" [9]. The following have been introduced:

- "Administrative innovation" (Evan, 1966 ; Teece, 1980 ; Damanpour, 1987),
- "Organizational innovation" (Daft, 1978; Damanpour and Evans, 1984; Ménard, 1995; Ayerbe-Machat, 2003)
- "Managerial innovation" (Birkinshaw and Mol, 2006; Hamel, 2006; Birkinshaw et al., 2008; Damanpour and Aravind, 2012; Jaouen and Le Roy 2013). [8]

Therefore, depending on the perspective taken by each author, a large number of definitions of innovation have been proposed. In this article, we are particularly interested in the managerial dimension of innovation. Table 1 below presents some definitions.

Table 1. : Definitions of managerial innovation (Source: developed by the author)

Definition	Author
A creative destruction that incessantly revolutionizes the economic structure from within, continually destroying its aged elements and continually creating new elements [10]	J. A. Schumpeter (1942)
The introduction of processes, practices, or managerial techniques that are new to those already known in order to achieve the objectives [11]	Hamel, et al. (2008)
The invention and implementation of a managerial practice, managerial process, structure or technique, which are new to the state of knowledge with the intention of achieving organizational objectives [12]	Birkinshaw, Hamel and Mol (2008)
The introduction of new management practices for the organization with the aim of increasing its performance [13]	Birkinshaw and Mol (2009)
The adoption of new management practices or approaches by organizations to improve their overall performance [8]	Le Roy et al., (2013)

In summary, managerial innovation can be defined as the introduction of new methods, practices or approaches into the management of an organization. It consists of rethinking and reinventing traditional management approaches in order to promote the adaptability, performance and growth of the organization in a constantly changing environment.

2. The relationship between innovation and organizational resilience

2.1. Contributions of literature

Theoretically, several authors have confirmed the existence of a positive relationship between innovation on the one hand and organizational resilience on the other. As such, Richtnér & Löfsten, (2014) argue that although resilience and innovation are distinct concepts, they can complement each other [14]. In a context of challenges, companies tend to strengthen their capacity for innovation in order to maximize the returns on their investments. This approach leads them to develop their resilience to thrive in today's turbulent environments (Richtnér & Löfsten, 2014). Table 2, below, presents some work highlighting the relationship between innovation and organizational resilience.

Table 2. : Relationship between innovation and organizational resilience (OR)
 (Source: developed by the author)

Innovation Relationship – R.O.	Author	Methodology
One of the main ways to help companies cope with risks and turbulence is to be innovative [14]	Bustinza, Vendrell-Herrero, Perez-Arostegui and Parry (2019)	Quantitative method (205 manufacturing enterprises) – Structural equation model
Organizational resilience is the ability to rebuild continuously. This requires innovation in organizational values, processes, and behaviours that systematically foster perpetuation over innovation [15]	Hamel and Valicangas (2003)	Single Case Method – More than 15 interviews
Three factors determine organizational resilience: risk management, organizational innovation processes, and staff training and development processes [16]	David Rehak (2019)	Multi-criteria analysis – weighted ranking method
The building blocks that underpin the concept of resilience are: •Anticipation: leadership, resources, organizations, business models and innovation, resilience plans and environmental analysis. •Response: leadership, resources, organizations and business models and innovation. •Adaptation: Learning and Change management. [17]	- Kijan Vakilzadeh et Alexander Haase (2021)	Documentary study – 69 studies

2.2. Contextualization and empirical results

2.2.1 Contextualization

Organizations in all industries now face pressures for their own survival (Butterick & Charlwood, 2021, Ketchen & Craighead, 2020) [18]. The COVID-19 pandemic and its dramatic impact on the global economy is a case in point. Faced with this environment, companies have no choice but to become more flexible, adaptable, resilient and innovative in order to survive and thrive (Liu et al., 2019) [19].

In Morocco, as everywhere in the world, the consequences of crises weigh heavily on companies, impact their performance and can jeopardize their business continuity [20]. In the energy sector, the challenges facing Moroccan operators are major and concern, among other things, water scarcity and drought, renewable energies and decarbonisation [21].

2.2.2 Empirical results

Analysis of interview data shows that the 11 interviewees confirmed the existence of a positive relationship between innovation and firm resilience in times of crisis. In addition, 10 out of 11 respondents identified innovation as a key success factor for their business resilience. In addition, 9 out of 11 of the production and operations managers surveyed said that their companies have used innovation during periods of crisis, such as the Covid-19 pandemic.

To the question: how does innovation influence the organizational resilience of your company? Respondents explained that there are indeed several forms of innovation, such as innovation in working methods and processes (9 out of 11 respondents), the introduction of

a new product or service on the market (8 out of 11 respondents) or the design of a new business model that breaks with the competition (3 out of 11 respondents).

In relation to the particularities of the Moroccan energy sector, 7 out of 11 respondents explained that by investing in innovation, companies in the Moroccan energy sector can strengthen their resilience, through:

- **Diversification of energy sources:** By having access to different energy sources, companies can better cope with price fluctuations, potential shortages or disruptions in a specific sector.
- **Adoption of advanced technologies:** such as renewable energy, energy storage, smart grids and energy efficiency. These technologies enable more efficient use of energy resources, reduce dependence on fossil fuels and contribute to the transition to a more sustainable and resilient energy system.
- **Risk and crisis management:** Companies can develop advanced monitoring systems, risk forecasting models, business continuity plans, and early warning mechanisms to manage crises.

However, 9/11 respondents said that despite the contributions of innovation, innovation alone cannot guarantee a company's resilience in the face of a crisis. Depending on the intensity of the event, the interviewees emphasized the importance of financial resources, leadership of the leader, change management, staff training and the support of all stakeholders for innovative projects.

Discussion

Through this article, we come out with three significant results. First, the existence of a positive correlation between organizational resilience and innovation. The latter is indeed recognized as one of the determining factors of resilience.

Secondly, qualitative research, carried out through semi-structured interviews, highlights the existence of several forms of innovation. This result is particularly interesting, given its consistency with the literature. Indeed, the work of (Hamel & Breen, 2007) distinguishes four forms of innovation: process innovation, product or service innovation, strategic innovation and managerial innovation (see Fig N°1 below) [22]:

Figure N°1 : La pyramide de l'innovation



Source : (Hamel & Breen, 2007)

Third, innovation alone does not guarantee a company's exit from the crisis and its resilience. There are other factors at play. This result confirms the contributions of the literature presented in subsection 2.1 of this article. Moreover, it is consistent with the recent work of Z. He et al. (2023). The latter argues that strategic technology investment helps organizations develop systematic control of crisis support operations, but may not directly contribute to employees' abilities to accurately understand external disorders, actively seek available resources, and rapidly develop adaptive solutions [23].

Based on the qualitative research method, this work is not exempt from limitations. These include the difficulty of extrapolating qualitative results to large scales or other contexts. To overcome this weakness, we recommend supplementing this study with a quantitative approach; since the integration of the two provides a better analysis of research questions (Huberman and Miles, 2003, Strauss 1990, Yin 2006).

Conclusion

In this article, we sought to understand the link between innovation and organizational resilience in the Moroccan energy sector. In a first section, we presented the conceptual and theoretical framework of our research. Next, we discussed the relationship between innovation and organizational resilience on two levels. First, through the contributions of the literature in relation to this question; second, by presenting the results of our qualitative research.

Organizational resilience is a complex concept that has gained new momentum in recent studies of organizations [24]. It is the result of a set of interacting factors. Innovation, on the other hand, has become vital for business development. Although both concepts are widely studied, few studies illustrate the relationship between the two in the Moroccan energy sector.

We think the results of our research are interesting. They support the theoretical contributions of the literature. However, they should be supplemented by carrying out a quantitative study.

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