


Chapter 15


Digitalizing Water Management for Business Resilience and Sustainable Growth: A Triadic Approach to Digital Transformation and Stakeholder Engagement

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ABSTRACT

This study explores the significant impact of digital transformation, stakeholder engagement, and sustainability in enhancing business resilience and future growth in Egypt's water sector. The study provides a comprehensive framework for water management through digital transformation to fit the Egyptian context in the lights of Spain experience. It shows the integration approaches to sustainability and digital technologies using stakeholder engagement in enhancing efficiency, resilience, and sustainability of water management systems. It also identifies motives and barriers to provide active insight into how these challenges of specialized skills needs, infrastructure limitations, and policy constraints can be overcome. Moreover, this research explains how digitalization in the water sector can open new business opportunities, enhance innovation, and provide new revenue streams for both startups and existing companies.

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1. INTRODUCTION

The water sector in Egypt faces significant challenges, including water scarcity, infrastructure deterioration, and increasing demand on water for different purposes due to population growth and the requirements of economic development (Hegazy & El-Gohary, 2014; Taha et al., 2017).

To address these problems, organizations in the Egyptian water industry are trying to find innovative approaches that use digital technologies, ensure stakeholder engagement, and integrate sustainability practices (Aboelnga et al., 2018; Schiffer & Peake, 2020). Digital transformation has recently emerged as a key strategy for enhancing water management efficiency, improving decision-making, and optimizing water allocation (Zyoud et al., 2016).

The integration of modern digital technologies, such as sensors, data analytics, and cloud computing, can enable simultaneous monitoring, predictive maintenance, and automated control systems, that would consequently lead to improved water distribution systems, reduced water losses, and enhanced customer service and stakeholders' engagement (Abdelkader et al., 2015; Schiffer & Peake, 2020).

Stakeholder engagement is also essential in the water sector, as it involves coordinating the interests and needs of multiple stakeholders, including government agencies, water utilities and organizations, industries, and local communities and civil society (Hegazy & El-Gohary, 2014; Taha et al., 2017). Effective stakeholder engagement can foster collaboration, enhance transparency, and promote the adoption of sustainable water management practices (Aboelnga et al., 2018; Zyoud et al., 2016).

Sustainability is another crucial dimension of water management, as it aims to ensure the long-term availability and equitable distribution of water resources (Schiffer & Peake, 2020). Integrating sustainability principles, such as water conservation, wastewater management, and the use of renewable energy, can contribute to the resilience and sustainability of water systems (Abdelkader et al., 2015; Hegazy & El-Gohary, 2014).

This study explores the interplay of digital transformation, stakeholder engagement, and sustainability in enhancing business resilience and driving sustainable growth in Egypt's water sector. The primary objective of the study is to develop a comprehensive framework for digital transformation in water management that would enhance business resilience, sustainability, and stakeholder engagement in Egypt based on the lessons learnt from Spain's successful initiatives. It examines how digital transformation could improve resource efficiency and resilience in water management. In addition, it determines the role of multiple stakeholders in driving sustainable water management practices. The barriers and motivations for adopting digital water management solutions in Egypt are deeply discussed in the study.

The study contributes to answering the following research questions by investigating practical applications of water digitalization lead by different stakeholders:

- How can the triadic approach of digital transformation, sustainability practices, and stakeholder engagement enhance the efficiency as well as resilience of water management systems in the Egyptian water sector?
- What are the related motives and barriers to adopting digital water management solutions in Egypt, and how can stakeholder engagement and sustainability practices be part of overcoming these barriers?
- What are the barriers and enablers for implementing digital water management systems in Egypt?
- How could the water sector decision makers, benefit from Spain's initiatives on digitalizing water management sector to develop a sustainable and resilient water management framework in Egypt?

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