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Article

THE EFFECTIVENESS OF THE INNOVATION ACCELERATION METHODOLOGY IN DEVELOPING INNOVATIVE SOLUTIONS AND MEASURING ITS INSTITUTIONAL IMPACT IN GOVERNMENT ENTITIES

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Abstract: This study aimed to measure the effectiveness of the innovation acceleration methodology in developing innovative solutions and its institutional impact in government entities. The study adopted a quasi-experimental approach based on a one-group design with pre- and post-measurements. The study sample consisted of 773 employees working in Saudi government entities. A data collection instrument was developed, consisting of 40 items distributed across five main axes: innovation acceleration methodology, quality of innovative solutions, and institutional impact (represented by five dimensions: time efficiency, performance efficiency, technology adoption, digital transformation, and competitiveness). The validity and reliability of the instrument were verified, with the Cronbach's alpha coefficient for the entire measurement tool reaching 0.94. To test the study hypotheses, a paired-samples t-test was used to compare the means of the pre- and post-measurements.

The results revealed statistically significant differences between the pre- and post-measurements in the development of innovative solutions, in favor of the post-measurement. The findings also indicated significant improvements in time efficiency across all stages of the innovation process. Furthermore, the results confirmed the positive institutional impact of the methodology across four dimensions (time efficiency, performance efficiency, technology adoption, and digital transformation), while no statistically significant differences were found in the competitiveness dimension.

The study recommended adopting the innovation acceleration methodology as an institutional framework within government entities, designing training programs based on iterative practices and time-constrained innovation techniques, linking these programs to the quality of innovative solutions, and conducting longitudinal studies to examine the sustainability of competitiveness outcomes. It also recommended investigating the influence of leadership practices and resource availability on innovation acceleration.

Keywords: innovation acceleration methodology, concurrent thinking, Global AL -Madina Program, innovative solutions, institutional impact, government entities.

1. Introduction

Innovation is no longer considered a luxury; rather, it has become a necessity and a prerequisite for the survival, sustainability, and competitiveness of institutions (World Economic Forum, 2020). Accelerating innovation and transforming ideas into practices that institutions adopt and integrate into their daily operations has become essential due to the rapid pace of technological advancement and its impact on all aspects of modern life. Studies indicate that large institutions, despite their significant technical and financial capabilities, often face difficulties in transforming innovative ideas into applicable solutions in a timely manner. Researchers attribute this challenge to procedural complexity and the accumulation of traditional work processes that hinder rapid responses to change (Tidd & Bessant, 2014; Chesbrough, 2010). A study by Chesbrough (2010) confirmed that institutions applying innovation acceleration mechanisms achieved market access 35% faster than those that did not, suggesting an inverse relationship between organizational complexity and the speed of transforming ideas into innovative solutions.

These observations form the core of the current research problem, which stems from a reality documented by international reports: the growing gap between generating innovative ideas within government entities and

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transforming them into practical and implementable solutions. The World Economic Forum report (2020) revealed that institutions adopting clear innovation methodologies and emerging digital tools are better able to improve performance and achieve a competitive advantage in complex and rapidly changing environments, whereas institutions lacking such methodologies tend to respond more slowly to change. The Organization for Economic Co-operation and Development (OECD, 2018) also emphasized that innovation is not a matter of chance but requires systematic frameworks that enable organizations to build sustainable capacities for exploration, experimentation, and implementation of new ideas.

The reports of the Saudi Ministry of Communications and Information Technology showed that the combination of methodological frameworks and investment in emerging technologies enabled Saudi institutions to develop innovative solutions (MCIT, 2023). However, the same report highlighted challenges related to bureaucracy and procedural complexity. The Saudi Data and Artificial Intelligence Authority (SDAIA, 2025) also emphasized the need to adopt clear innovation management strategies to maximize the benefits of rapidly evolving technologies.

In this context, government institutions are no longer isolated from these transformations; rather, they are at the center of them, as citizens increasingly expect smart, fast, and personalized government services. However, emerging technologies alone are insufficient to achieve innovation objectives. Research has shown that institutions investing in advanced technologies without systematic innovation management frameworks often fail to achieve the expected return on investment (Chatterjee, Rana, & Dwivedi, 2021). In some cases, technological complexity itself becomes an obstacle rather than a catalyst for innovation.

Innovation acceleration methodology emerged as a practical response to these challenges. The Innovation acceleration Methodology was first developed and introduced by Dr. Samar Abdeen, the creator and originator of the methodology. at Universiti Sains Malaysia (USM) in 2015 as part of the Global AL -Madina Program for Innovation Development (Abdeen, 2016). It underwent continuous development, testing, and practical application across Organizations and, Companies, universities, and institutions until reaching its developed form in 2020 (Abdeen, 2020).

Abdeen (2020) defines innovation acceleration as "Accelerating the transformation of ideas into innovative solutions using completion time as a performance indicator" It is improving and accelerating performance through training, repetition, and time-constrained practice, enabling individuals and institutions to acquire skills more efficiently and achieve higher levels of performance within shorter periods. This definition highlights the methodology's core components: training, repetition, time constraints, and performance improvement.

The proposed methodology possesses several characteristics that make it suitable for application within the government sector, including its emphasis on time as a performance indicator, reliance on repetition and training to develop and reinforce skills, adaptability across different contexts, and its practical nature, which provides clear guidance for implementing innovation practices (Abdeen & Zuri, 2015; Abdeen & Ewies, 2019).

Saudi Vision 2030 recognizes digital innovation as a key enabler of sustainable development and promotes innovative approaches to improving government services (Saudi Vision 2030, 2021). The Saudi Ministry of Communications and Information Technology (MCIT, 2023) also confirmed that the integration of innovation acceleration frameworks with investments in emerging technologies enabled Saudi institutions to develop innovative solutions and respond effectively to crises such as the COVID-19 pandemic.

The SDAIA (2025) report further demonstrated that the adoption of artificial intelligence and the Internet of Things contributed significantly to the Kingdom's advancement in digital government indicators. Nevertheless, these reports also highlight ongoing weaknesses in innovation management mechanisms, limiting the ability of government entities to fully realize the value of emerging technologies.

From an academic perspective, a review of the literature reveals a limited number of field studies examining the application of innovation acceleration methodology within the government sector and measuring its institutional impact. According to the Innovation Land Lab study (2025), most previous studies have focused either on innovation methodologies or on emerging technologies separately, while studies integrating both dimensions within a unified framework remain scarce. The study also indicated a shortage of research conducted within the Arab and Saudi contexts.

Although previous studies suggest that successful technology adoption depends on the presence of clear innovation frameworks (Tidd & Bessant, 2014), these frameworks have not been sufficiently examined within the unique context of government institutions. What succeeds in private-sector environments may not necessarily succeed in public-sector settings.

According to Chatterjee, Rana, and Dwivedi (2021), institutions with clearly defined innovation methodologies are better positioned to leverage artificial intelligence and big data to improve services. However, the findings were derived primarily from non-Saudi contexts, raising questions regarding their applicability to Saudi government institutions.

Within the framework of evaluating the effectiveness of innovation acceleration methodology, a study conducted by Abdeen and Ewies (2019) on gifted students at Taibah University found statistically significant differences in Innovative Thinking abilities in favor of the experimental group exposed to the innovation acceleration strategy. Similarly, Alaswd (2017) reported the effectiveness of the innovation acceleration strategy within the Global AL -Madina Program in developing Innovative Thinking skills among gifted students in Jordan.

In the context of future-thinking development, Hussein (2024) reported statistically significant differences in favor of the experimental group that learned through the innovation acceleration strategy. Likewise, Kazem (2020) demonstrated that training programs based on Global AL -Madina Program strategies, including innovation acceleration, were effective in developing lesson implementation skills and concurrent thinking among Arabic language teachers.

Xu, Chen, and Zhang (2018) found that applying concurrent thinking in digital projects reduced project completion time by 22% and improved the efficiency of multidisciplinary teams. Similarly, Chesbrough (2019) found that organizations utilizing innovation acceleration mechanisms reached markets 35% faster than their counterparts.

Most previous studies, despite their importance, were conducted in educational settings or private-sector organizations. The government sector remains underrepresented in research related to innovation acceleration despite being characterized by procedural complexity, multiple decision-making layers, and greater risk sensitivity. Therefore, an important question remains:

How effective is the innovation acceleration methodology in developing innovative solutions and generating measurable institutional impact within government entities?

2. Research Problem

In the Kingdom of Saudi Arabia, government institutions are experiencing an unprecedented acceleration in digital transformation efforts, supported by ambitious strategic directions such as Saudi Vision 2030, which identifies digital innovation as a key enabler of sustainable development (Saudi Vision 2030, 2021). In this context, government entities have invested extensively in the adoption of emerging technologies, including artificial intelligence, the Internet of Things, big data, and blockchain, to improve the quality of services provided to citizens (MCIT, 2023; SDAIA, 2025). However, official reports indicate that these institutions continue to face challenges in their innovation management mechanisms, limiting their ability to realize the full value of these technologies (MCIT, 2023).

One of the most visible manifestations of this challenge is the extended time required to transform innovative ideas into practical and implementable solutions, a process that often takes significantly longer than in the private sector (Chesbrough, 2010). This delay is attributed to complex government procedures, multi-layered decision-making structures, and the accumulation of traditional work processes, all of which reduce organizational responsiveness to change (Tidd & Bessant, 2014). The implications of this issue extend beyond administrative inefficiency, as delays in delivering innovative public services may negatively affect beneficiary satisfaction and reduce the competitiveness of the national economy (World Economic Forum, 2020).

This challenge is further supported by the findings of Chatterjee, Rana, and Dwivedi (2021), who found that institutions with clearly defined innovation methodologies are better positioned to leverage artificial intelligence and big data to improve service delivery. Similarly, Tidd and Bessant (2014) argued that the presence of a clear innovation framework is a prerequisite for the successful adoption of emerging technologies within institutions. Nevertheless, these studies were conducted primarily in Western contexts, raising questions about the applicability of their findings to the Saudi environment, which possesses distinct organizational, administrative, and cultural characteristics.

Based on the foregoing, the problem of the current study lies in the need to empirically examine the effectiveness of the innovation acceleration methodology in developing innovative solutions within Saudi government entities and to assess the institutional impact resulting from its application.

Accordingly, the main research question of the study is:

"What is the effectiveness of the innovation acceleration methodology in developing innovative solutions, and what institutional impact does its application generate within government entities?"

Research Objectives

General Objective

To assess the institutional impact of the innovation acceleration methodology on government entities and evaluate its effectiveness in developing innovative solutions.

Objectives of the sub-aims:

1. To examine the effectiveness of the innovation acceleration methodology in developing innovative solutions within government entities.
2. To assess the overall institutional impact of the innovation acceleration methodology on government entities.
3. To identify the differences between pre- and post-measurements of institutional performance dimensions (time efficiency, performance efficiency, technology adoption, digital transformation, and competitiveness) following the application of the innovation acceleration methodology.

Research Questions

Main Research Question:

What is the effectiveness of the innovation acceleration methodology in developing innovative solutions, and what institutional impact does its application generate within government entities?

1. To what extent does the innovation acceleration methodology contribute to the development of innovative solutions within government entities?
2. What is the institutional impact of applying the innovation acceleration methodology within government entities?
3. Are there statistically significant differences between the pre- and post-measurements in institutional performance (time efficiency, performance efficiency, technology adoption, digital transformation, and competitiveness) after applying the innovation acceleration methodology?

Significance of the Study

The significance of the study is determined by the following aspects:

Theoretical Significance

1. This study contributes to addressing a research gap represented by the limited availability of Arab field studies that have examined the application of the innovation acceleration methodology within the government sector and assessed its institutional impact.
2. The study presents an integrated conceptual framework that links innovation methodologies, particularly innovation acceleration, with emerging technologies within the government context, an area that remains underexplored in Arab literature.
3. The study provides a standardized measurement model that may be utilized in future research to assess the institutional impact of innovation methodologies in government entities.
4. The study contributes to validating the applicability of the innovation acceleration methodology within a new context, the government sector—which differs substantially from the educational and private-sector contexts in which the methodology has previously been examined, thereby enriching the literature on innovation management and public-sector innovation.

Practical significance

1. The findings of the study provide practical guidance for government entities regarding the adoption of the innovation acceleration methodology to accelerate the development of innovative solutions, thereby enhancing the quality, efficiency, and responsiveness of government services.

2. The study supports decision-makers in designing more effective strategies to achieve digital transformation objectives and align institutional performance with the goals of Saudi Vision 2030.
3. The results of the study can be utilized in the design and development of specialized training programs aimed at strengthening employees' capabilities in digital innovation and innovation acceleration.
4. The study offers a practical model that can be adapted and implemented by government entities across Arab countries to strengthen innovation capabilities and improve institutional performance.

Terms Used in the Study

To avoid any ambiguity in the fundamental concepts of the study, the following definitions have been established:

Innovation Acceleration Methodology

It is defined as a set of organized practical procedures and trainings aimed at accelerating the transformation of ideas into innovative solutions by using completion time as a key performance indicator and relying on repetition and training within specific time constraints (Abdeen, 2020).

Operational Definition: It is defined in this study as the set of organized practical procedures and trainings applied by government entities, aimed at accelerating the transformation of ideas into innovative solutions. It is measured through the degree of the entity's application of the methodology's core elements: task identification, time measurement, training and repetition, and continuous evaluation, using a measurement instrument prepared for this purpose.

Innovative Solutions

They are defined as the practical outputs of applying innovation methodologies, represented in new or significantly improved products, services, or processes that create added value for the institution and beneficiaries (OECD, 2018).

Operational Definition: They are defined in this study as the practical outputs of applying the innovation acceleration methodology in government entities. They are measured through the number of innovative solutions developed, the speed of transforming an idea into an application, and the rate of improvement in services provided, using the measurement instrument prepared for this purpose.

Institutional Impact

It is defined as the positive changes that occur in an institution's performance as a result of applying a specific methodology or program, including improvements in efficiency, effectiveness, quality, and competitiveness (Innovation Land Lab, 2025).

Operational Definition: It is defined in this study as the positive changes that occur in a government entity's performance as a result of applying the innovation acceleration methodology. It is measured through five main dimensions: **time efficiency** (reducing the time taken to transform ideas into applications), innovative performance efficiency (improving output quality and reducing errors), emerging technology adoption (the ability to keep pace with technological developments), digital transformation (improved processes and beneficiary satisfaction), and competitiveness (improvement in the entity's position compared to its peers). These dimensions are measured using the measurement instrument prepared for this purpose.

Government Entities

They are defined as institutions, authorities, and ministries affiliated with the government, which provide public services to citizens and residents and operate within a specific regulatory and legal framework (Saudi Vision 2030, 2021).

Operational Definition: They are defined in this study as the institutions, authorities, and ministries affiliated with the Saudi government, which provide public services to citizens and residents. These entities include ministries, public authorities, government institutions, and national centers. Government-owned companies operating under a private sector model are excluded from this definition.

Innovative Solutions Development

It is defined as the chronological stages that an innovative idea goes through from the moment of its generation until its transformation into an applicable product, service, or process (Tidd & Bessant, 2014).

Operational Definition: It is defined in this study as the time period taken to transform an innovative idea into an applicable solution within a government entity. It is measured through the time taken in each stage of development (idea generation, evaluation, development, testing, launch), using the measurement instrument prepared for this purpose.

Theoretical Framework and Previous Research

This section offers a theoretical basis for the basic concepts of the research and describes the methodology of innovation acceleration and innovative solutions. It also provides the most relevant previous studies that have investigated variables related to innovation acceleration methodology, innovative solutions, and institutional impact. This section aims to place the current study within the context of existing research and to draw upon previous findings in establishing relationships among the study variables and interpreting the results.

First: Innovation Acceleration Methodology

Theoretical Framework

Concept of Innovation Acceleration Methodology

The innovation acceleration methodology proposes a modern approach that enables institutions and individuals to manage creativity and innovation in accordance with contemporary scientific theories. The methodology is based on providing a practical and structured framework for bridging the time gap between an idea conceived as a theoretical concept and its transformation into a tangible service or an implementable innovative solution, rather than assuming that innovation occurs spontaneously and without structure. The methodology utilizes time as a key performance indicator by preparing and training individuals to complete tasks with higher quality in shorter periods through repetition and practice within clearly defined time constraints (Abdeen, 2020; Abdeen, 2016).

Abdeen defined innovation acceleration as "improving performance through training and repetition within specific time constraints, whereby repeated practice enables skills to be acquired in shorter periods and leads to enhanced performance" (Abdeen, 2020). Similarly, Abu Jado emphasized the importance of bridging the gap between theoretical propositions and practical application in order to establish a clear connection between theory and practice (Abu Jado, 2006). This is precisely what the innovation acceleration methodology seeks to achieve: accelerating the transformation of creative ideas into tangible innovative solutions.

Therefore, in this research, the innovation acceleration methodology can be operationally defined as a set of organized practical procedures and training activities applied by institutions or individuals to develop creative capabilities and accelerate the innovation lifecycle from idea generation to implementation, while measuring performance based on the time required for completion without compromising quality standards.

The innovation acceleration methodology emerged from a series of research studies conducted by Dr. Samar Abdeen at Universiti Sains Malaysia (USM), one of the world's leading research universities. The methodology is considered one of the foundational components of the Global AL -Madina Program for Innovation Development, which was launched in 2016 (Abdeen, 2016).

The innovation acceleration methodology draws upon several scientific theories. One of its primary foundations is the Concurrent Thinking Theory developed by Abdeen (2014), which is based on the brain's ability to perform multiple mental processes simultaneously with high efficiency. The methodology was also influenced by brain-based learning theories and Sternberg's Successful Intelligence Theory.

The methodology underwent extensive experimentation and development over several years across schools, universities, and institutions until its developed version was formally introduced in 2020, becoming a recognized methodology in the fields of institutional innovation and human development (Abdeen, 2020; Abdeen, 2021). In this respect, the innovation acceleration methodology shares similarities with other innovation methodologies that seek to shorten the time required to transform ideas into products or services (World Economic Forum, 2020).

Furthermore, the innovation acceleration methodology seeks to improve performance quality by enhancing efficiency and effectiveness in innovation-related tasks through intensive training and structured repetition. This strengthens the institution's ability to respond rapidly and effectively to technological developments and emerging challenges.

On the other hand, the implementation of the innovation acceleration methodology contributes to the development of creative capabilities by strengthening skills such as fluency, flexibility, and originality through time-

constrained practical exercises (Abdeen, 2020). The methodology considers time as a primary indicator of progress while simultaneously linking performance improvement to mastery achieved through training and repetition. It is also adaptable to a wide range of contexts and fields while taking individual differences and capabilities into account (Abdeen & Zuri, 2015). In addition, the methodology extends beyond theoretical principles by providing an integrated practical framework that equips trainers with concrete procedures for implementation across various sectors (Abdeen & Ewies, 2019).

The methodology, consistent with its practical orientation as described by Abdeen (2016), operates through a series of procedural steps aimed at maximizing the utilization of mental capabilities. Once the target skill is identified—whether fluency, flexibility, or problem-solving—the time required to perform the task is measured and used as a baseline for future comparison. Subsequently, performance barriers such as lack of focus or insufficient information are identified and analyzed. The individual then undergoes structured training and repeated practice across multiple tasks to strengthen the targeted skill while reducing completion time without compromising quality and accuracy. Throughout this process, continuous assessment is conducted to compare performance against the baseline and determine progress levels. Individuals are then gradually moved to more advanced levels that require greater complexity and shorter completion times (Abdeen, 2016).

In the field of training and institutional development, the innovation acceleration methodology can be applied by training employees to perform their tasks more efficiently and within shorter timeframes, thereby increasing innovation capacity within institutions (Abdeen, 2021). The methodology is also utilized within technology and digital transformation initiatives as a mechanism for accelerating the adoption of emerging technologies such as artificial intelligence and the Internet of Things and rapidly transforming innovative ideas into practical applications that support institutional objectives (Abdeen, 2020).

The innovation acceleration methodology can likewise be applied within educational contexts, where it is used in curriculum design and academic activities aimed at developing Innovative Thinking skills and accelerating innovation among students. An example is the study conducted by Abdeen (2020) on the role of the Giftedness and Creativity course in developing innovation acceleration skills among female students at Taibah University.

There are several challenges associated with implementing the methodology despite its numerous benefits. Although the innovation acceleration methodology can be applied across a wide range of sectors, weak institutional infrastructure may reduce its effectiveness, particularly when integrating emerging technologies such as artificial intelligence and the Internet of Things. Effective implementation requires adequate technological infrastructure and financial resources to support training and implementation tools, which may be limited in some institutions and sectors (MCIT, 2023).

In addition, the absence of specialized digital platforms supporting training, repetition, and continuous evaluation processes may reduce the methodology's effectiveness. Resistance to change represents another challenge. Al-Sakarna (2017) identified resistance to change as one of the primary obstacles to the implementation of new methodologies within organizations. Employees accustomed to traditional work approaches may perceive structured and repetitive training activities as an additional burden.

Another challenge involves the limited availability of qualified trainers with sufficient expertise in the innovation acceleration methodology and its application across different contexts (Abdeen, 2021). Likewise, organizational cultures that do not encourage experimentation and learning from failure may hinder successful implementation.

Measuring the return on investment of innovation acceleration programs also represents a significant challenge because the effects of such methodologies may not become immediately visible and often require time to materialize (Chatterjee, Rana, & Dwivedi, 2021). Furthermore, measurement outcomes are influenced by individual differences among trainees, requiring flexibility in the application of time constraints during training activities (Abdeen & Zuri, 2015).

Additional challenges involve the accurate identification of performance indicators and adapting the methodology to diverse institutional contexts. The Innovation Land Lab study (2025) found statistically significant differences in the adoption of innovation methodologies between public and private institutions, with public institutions demonstrating greater commitment to systematic implementation while private organizations focused more heavily on direct technological returns.

Similarly, some sectors may not provide the same degree of flexibility for applying the methodology, particularly sectors governed by strict operational procedures or security requirements. Another important challenge concerns the sustainability of innovation acceleration programs. Given the continuous evolution of technologies, institutions must continuously update their methodologies, tools, and training programs. Without continuous adaptation, innovation methodologies risk becoming ineffective in rapidly changing environments (World Economic Forum, 2020).

Likewise, sustainable implementation requires integrating innovation acceleration practices into organizational culture and linking them to employee incentive systems and performance management mechanisms (Al-Kazem, 2023).

To overcome these challenges, institutions need comprehensive strategies that provide adequate resources, foster supportive innovation cultures, establish effective evaluation systems, and treat training as a long-term investment in human capital. Cooperation between public and private sectors is also essential for sharing best practices and strengthening innovation acceleration capabilities across institutions (OECD, 2018).

3.Related Studies on Innovation Acceleration

In this section, the researcher reviews previous studies that have addressed the innovation acceleration methodology and related variables. These studies are organized into three main axes to provide a comprehensive understanding of the research context of the current study.

First Axis: Studies on Innovation Acceleration Methodology and Its Impact

Simmons et al. (2003) attempted to define Innovation Acceleration and clarify its foundations. The study aimed to present a conceptual framework for acceleration as a creative strategy designed to generate unprecedented practices and capabilities based on originality as a core element. This study contributes to the theoretical foundation of the innovation acceleration methodology examined in the current research.

Al-Sulaiti (2004) aimed to explain the neurological and cognitive foundations underlying the operation of the Innovation Acceleration strategy. The study concluded that neural patterns associated with problem-solving are distributed throughout the brain and can be developed through training and practice. It also demonstrated that creativity can be cultivated through continuous training, thereby supporting the theoretical foundations of the innovation acceleration methodology.

In the same context, Karkockiene (2005) conducted a study on students from a College of Education to examine the possibility of developing creativity through educational programs. The results indicated that the program had a positive effect on creativity development among participants and recommended the adoption of training programs to nurture creative abilities. These findings support the innovation acceleration methodology, which is fundamentally based on training and repeated practice.

Chesbrough (2010) examined how innovation methodologies contribute to the development of new business models and explored the role of business model innovation in enhancing competitiveness. The study analyzed cases from Silicon Valley companies, including 135 start-up firms. The findings revealed that organizations applying innovation acceleration mechanisms achieved market access 35% faster than their counterparts. The study confirmed the effectiveness of innovation acceleration methodologies in business environments and highlighted their importance in achieving competitive advantage.

The theory of concurrent thinking is closely associated with the innovation acceleration methodology. Xu, Chen, and Zhang (2018) investigated the relationship between concurrent thinking and the management of complex digital projects using a case study and comparative research design. The findings showed that the application of concurrent thinking reduced project completion time by 22% and improved the efficiency of multidisciplinary teams. The study further demonstrated that combining concurrent thinking with digital project management tools enhanced the quality of innovative outputs.

Abdeen and Zuri (2015) reviewed the cognitive and emotional processes embedded within the Global AL -Madina Program, including concurrent thinking, innovation acceleration, and employment strategies. The study aimed to present a theoretical and practical framework for the Global AL -Madina Program, of which innovation acceleration represents a core component. The results highlighted the positive impact of training on innovation acceleration among participants.

In a study conducted by Abdeen (2016), a Global AL -Madina Program training intervention was implemented among students at King Abdullah II Schools for Excellence in Madaba using a mixed-methods design. The purpose was to assess the impact of the program on the Innovative Thinking abilities of gifted students studying English as a foreign language in Jordan. The results revealed statistically significant differences in favor of the Global AL -Madina Program, which includes innovation acceleration as one of its three main pillars.

Similarly, Aljbab (2016) investigated the effect of the Global AL -Madina Program, including the innovation acceleration strategy, on the academic achievement of gifted students in King Abdullah II Schools in Jordan. The findings demonstrated a positive impact on student achievement, confirming the role of innovation acceleration in enhancing Innovative Thinking and performance.

Alaswd (2017), in a study entitled *"The Impact of Using the Global AL -Madina Program on Improving Innovative Thinking among Gifted Students in Jordan,"* aimed to measure the effect of the Global AL -Madina Program, including the innovation acceleration strategy, on Innovative Thinking skills such as originality, fluency, flexibility, and elaboration. The findings indicated a positive effect of the innovation acceleration methodology on Innovative Thinking, confirming its effectiveness in developing these skills.

Alherbawy (2017) examined the impact of the Global AL -Madina Program on the development of critical thinking among gifted students at King Abdullah II Schools in Jordan. The findings demonstrated a positive effect of the innovation acceleration methodology on higher-order thinking skills among the participants.

Abdeen and Ewies (2019) investigated the role of the Innovation Acceleration strategy in improving Innovative Thinking skills among talented students at Taibah University. The results revealed statistically significant differences between the experimental and control groups in favor of the experimental group, confirming the effectiveness of the strategy in developing Innovative Thinking abilities.

In the field of language education, Al-Kazem (2020) conducted a study to determine the effectiveness of a training program based on Global AL -Madina Program strategies in developing lesson implementation skills and concurrent thinking among Arabic language teachers. The results showed a positive effect on lesson implementation skills and concurrent thinking in favor of the experimental group, confirming the effectiveness of innovation acceleration approaches in developing practical competencies.

Second Axis: Studies on Variables Related to Innovation Acceleration

In a study examining the relationship between concurrent thinking and achievement motivation among business administration students, Abdeen (2020) conducted a study entitled *"Concurrent Thinking and Its Relationship to Achievement Motivation among Taibah University Students in the Kingdom of Saudi Arabia."* The results revealed a low level of concurrent thinking but a high level of achievement motivation, indicating the existence of a developmental gap that may be addressed through specialized training programs.

Hussein (2024), in a study entitled *"The Effectiveness of the Innovation Acceleration Strategy in Developing Future Thinking among Second-Year Intermediate Students in Social Studies,"* found that the Innovation Acceleration strategy had a positive impact on future thinking skills. These findings support the possibility of applying innovation acceleration strategies to develop other higher-order thinking skills.

To investigate the impact of innovation acceleration on professional development, Al-Kazem (2023) examined the effectiveness of a training program based on the employment strategy in developing the competencies of primary school teachers. The study concluded that the program significantly improved participants' professional competencies, reinforcing the value of innovation acceleration approaches in professional development programs.

Third Axis: Studies on Innovation Methodologies and Emerging Technologies

Lee and Trimi (2021) conducted a study involving multiple organizations to explore the impact of innovation methodologies, such as design thinking and concurrent thinking, on enabling the adoption of emerging technologies. The results showed that these methodologies contribute positively to creating environments that support technology adoption and that organizations applying multiple innovation methodologies achieve more sustainable digital transformation outcomes.

Chatterjee, Rana, and Dwivedi (2021) investigated the integration of design thinking methodology with artificial intelligence technologies in government services. The study identified a strong positive relationship between the adoption of innovation methodologies and the adoption of emerging technologies, supporting the importance of integrating both dimensions to achieve better digital transformation outcomes.

The Innovation Land Lab conducted a study entitled *"Innovation Methodologies and Their Role in Enabling Emerging Technologies to Develop Innovative Solutions and Support Digital Transformation in the Kingdom of Saudi Arabia in the Public and Private Sectors."* The study found that institutions demonstrate a high reliance on innovation methodologies, which contributes to increased technology adoption. The findings also revealed that organizations employing more than one innovation methodology achieve superior digital transformation indicators (Innovation Land Lab, 2025).

Comments on Previous Research Pertaining to the Innovation Acceleration Methodology

The innovation acceleration methodology has been examined as an independent variable in several studies and has demonstrated effectiveness in developing a range of dependent variables, including Innovative Thinking, concurrent thinking, future thinking, and professional competencies, as reported by Alaswd (2017), Abdeen and Ewies (2019), Al-Kazim (2020), and Hussein (2024). These findings collectively support the effectiveness of the methodology across educational, training, and professional development contexts.

Previous studies have also revealed a shortage of integrative research that simultaneously examines innovation methodologies, emerging technologies, and innovative solutions within a unified analytical framework. This gap is particularly evident in the Arab context in general and the Saudi context in particular. Studies conducted by the Innovation Land Lab (2025) and Chatterjee, Rana, and Dwivedi (2021) highlighted the importance of integrating innovation methodologies with emerging technologies to achieve better innovation and digital transformation outcomes.

The reviewed studies employed a variety of research methodologies, including quasi-experimental and descriptive-correlational approaches, and targeted diverse populations such as university students, teachers, and employees in private-sector organizations. Despite the richness of these studies, the government sector remains relatively underrepresented, particularly with regard to measuring the institutional impact of innovation acceleration methodologies.

The present study builds upon the theoretical foundations and empirical findings of previous research, particularly those related to the effectiveness of the innovation acceleration methodology. However, the current study distinguishes itself by developing a broader and more comprehensive theoretical framework through the systematic collection, analysis, and synthesis of concepts related to innovation acceleration methodology, thereby providing a reference point for both researchers and practitioners.

In addition, the study seeks to bridge the gap between theory and practice by highlighting the practical applications of the methodology across different fields while emphasizing its role in supporting institutional innovation and digital transformation. The study also contributes to the conceptual clarification and academic grounding of the terms innovation acceleration and innovative solutions within Arab literature through reliance on peer-reviewed scientific sources.

Furthermore, the study addresses an important research gap by examining the effectiveness of the innovation acceleration methodology and measuring its institutional impact within government entities, a context that has received limited attention in previous research. This theoretical chapter provides a solid foundation upon which future researchers can build when conducting experimental or applied studies related to the innovation acceleration methodology across different sectors and research contexts, thereby opening new avenues for future research and practical applications.

Second: Solutions That Are Innovative

Innovative Solutions Concept

Innovative solutions are defined as the practical outputs resulting from the implementation of organized innovation methodologies within institutions, through which ideas are transformed into products, services, or processes that create added value for both the institution and its beneficiaries (Innovation Land Lab, 2025). Similarly, the Organization for Economic Co-operation and Development (OECD, 2018) emphasizes that innovative solutions are characterized by the positive impact they generate and the improvements they introduce compared with previous products, services, or processes. According to Tidd and Bessant (2014), innovative solutions are the outcome of a planned innovation process through which organizations transform opportunities into innovations and seek to utilize them effectively within their operational activities.

Several studies also confirm the close relationship between innovation methodologies and the development of innovative solutions, as the transformation of ideas into implementable projects requires a clear and structured methodology adopted by the institution. Lee and Trimi (2021) argue that, for example, the design thinking methodology enhances an institution's ability to address challenges and respond to the evolving needs of beneficiaries, thereby enabling the development of innovative solutions that are effective, useful, impactful, and efficient. The World Economic Forum (2020) further emphasizes that institutions seeking to respond to changing market requirements and achieve competitive advantage in dynamic environments must adopt clear innovation methodologies, emerging innovation tools, and effective digital solutions.

An innovative solution should possess several essential characteristics. It should be new or significantly improved, provide tangible value to both the institution and its beneficiaries, be practically applicable, and demonstrate sustainability through its ability to generate long-term impact. In addition, innovative solutions should be designed through an integrated approach that combines technology, people, and organizational processes in a holistic manner (Innovation Land Lab, 2025).

Recent studies also indicate a strong integrative relationship between innovation methodologies and emerging technologies in the development of innovative solutions. Innovation methodologies serve as the operational framework that guides the innovation process, while emerging technologies provide the practical tools that facilitate implementation and digital transformation (Chatterjee, Rana, & Dwivedi, 2021). Research conducted by the Innovation Land Lab found that institutions applying more than one innovation methodology achieve better digital transformation outcomes than institutions relying on a single methodology. The findings also suggest that innovation methodologies positively influence the adoption of emerging technologies, thereby contributing to the development of more sustainable, effective, and impactful innovative solutions (Innovation Land Lab, 2025).

Previous studies on innovative solutions

Previous studies addressing innovative solutions can be categorized into three main axes.

First Axis: Studies on Innovation Methodologies and the Development of Innovative Solutions

Brown (2009) employed an analytical approach to examine the impact of design thinking and its five stages (empathy, problem definition, ideation, prototyping, and testing) on enhancing institutions' ability to develop innovative solutions that address beneficiaries' needs. The findings demonstrated that the application of the design thinking methodology leads to higher levels of beneficiary satisfaction and increases the likelihood of success for innovative solutions. The study also highlighted the importance of placing beneficiaries at the center of the innovation process.

Second Axis: Studies on the Relationship Between Innovation Methodologies and Emerging Technologies in Developing Innovative Solutions

In a quantitative study, Chatterjee, Rana, and Dwivedi (2021) examined the impact of integrating design thinking methodology with artificial intelligence technologies on improving digital government services and developing comprehensive innovative solutions. The results revealed a strong positive relationship between the adoption of innovation methodologies and the adoption of emerging technologies. The study further found that institutions adopting innovation methodologies were more successful in leveraging artificial intelligence and big data to develop innovative solutions.

In the same context, Lee and Trimi (2021) conducted an analytical study based on reviewing the experiences of several companies across different countries to investigate the role of innovation methodologies, including design thinking and concurrent thinking, in supporting the development of innovative solutions based on emerging technologies. The findings showed that innovation methodologies create a supportive environment for experimenting with emerging technologies and gradually expanding their adoption, thereby reducing the risks associated with developing innovative solutions. The study also found that organizations applying more than one innovation methodology were more likely to achieve sustainable innovation outcomes.

Third Axis: Studies on the Institutional Application of Innovative Solutions

One of the studies that examined the role of innovation methodologies in enabling emerging technologies to develop innovative solutions and support digital transformation in both government and private institutions was conducted by the Innovation Land Lab (2025). The study employed a descriptive-correlational survey approach. The findings indicated that innovation methodologies contribute to greater adoption of emerging technologies and support

the development of more effective innovative solutions. The study also demonstrated that institutions applying multiple innovation methodologies achieved better digital transformation outcomes and that government institutions outperformed private-sector organizations in the adoption of innovation methodologies.

Similarly, the World Economic Forum report (2020) utilized large-scale international surveys to examine the impact of emerging technologies and digital transformation on labor markets and future workforce skills. The report emphasized that institutions adopting innovation methodologies and digital tools are better positioned to improve their outputs and strengthen their competitiveness in rapidly changing environments because of their ability to develop innovative solutions that respond to evolving market needs.

The Saudi Ministry of Communications and Information Technology (MCIT, 2023) also issued a report examining the integration of emerging technologies and innovation within the economic sector. The report aimed to demonstrate the contribution of emerging technologies to economic growth and resilience in the Kingdom of Saudi Arabia and to highlight how these technologies support service and product innovation. The findings revealed that institutions adopting innovation methodologies, including innovation acceleration approaches, in combination with emerging technologies became more capable of developing innovative solutions, particularly during crises such as the COVID-19 pandemic. The report further confirmed that the integration of innovation methodologies and emerging technologies generated tangible outcomes in supporting digital transformation initiatives.

Comments on Previous Research on Innovative Solutions

Previous studies demonstrate a diversity of innovation methodologies and approaches used to develop innovative solutions. Brown (2009) examined the design thinking methodology and its five stages and highlighted its role in developing beneficiary-centered innovative solutions. Meanwhile, Chatterjee, Rana, and Dwivedi (2021), as well as Lee and Trimi (2021), investigated the integration of multiple methodologies, including design thinking and concurrent thinking, reflecting a growing research trend toward examining interactions among innovation methodologies rather than studying them in isolation.

Several studies also explored the integrative relationship between innovation methodologies and emerging technologies. In particular, the studies conducted by Chatterjee, Rana, and Dwivedi (2021), Lee and Trimi (2021), and the Innovation Land Lab (2025) emphasized the importance of integrating innovation methodologies with emerging technologies such as artificial intelligence and big data to develop comprehensive innovative solutions. These studies confirmed that institutions combining multiple innovation methodologies with emerging technology adoption achieve more sustainable outcomes in their digital transformation initiatives.

A review of the existing literature reveals a shortage of field studies conducted within the Arab context in general and the Saudi context in particular. Although international studies addressing innovation methodologies are diverse and valuable, most have been conducted within European and North American contexts rather than regional environments. The Innovation Land Lab study (2025) represents a significant contribution in this regard, as it is among the first large-scale field studies conducted in Saudi Arabia, involving 1,287 employees from public and private sector organizations. Consequently, it provides locally grounded evidence regarding the adoption of innovation methodologies and emerging technologies within Saudi institutions.

Regarding research methodologies, previous studies employed a variety of approaches, including theoretical and analytical methods (Brown, 2009; Lee & Trimi, 2021), descriptive-correlational survey designs (Innovation Land Lab, 2025), and quantitative statistical analysis (Chatterjee et al., 2021). This methodological diversity reflects the richness of the field and provides opportunities for applying different research designs to examine the relationship between innovation methodologies and innovative solutions.

Previous studies have consistently demonstrated the effectiveness of innovation methodologies in enhancing institutional performance and supporting the development of innovative solutions. Chesbrough (2010) found that organizations applying innovation acceleration mechanisms achieved market access 35% faster, while Xu, Chen, and Zhang (2018) reported that the application of concurrent thinking reduced project completion time by 22%. Similarly, the Innovation Land Lab study (2025) revealed that the application of innovation methodologies directly contributes to higher levels of emerging technology adoption, which in turn supports the development of more effective innovative solutions.

This study builds upon the theoretical foundations and empirical findings of previous research, particularly regarding the importance of integrating innovation methodologies with emerging technologies to develop innovative

solutions. It also benefits from the methodological approaches and measurement tools adopted in prior studies when designing an instrument appropriate for the Saudi context.

However, the present study distinguishes itself by focusing specifically on the relationship between the innovation acceleration methodology and the development of innovative solutions, while simultaneously examining the institutional impact of this methodology within Saudi government entities. Furthermore, the study proposes an integrated theoretical framework that contributes to addressing the research gap represented by the limited number of Arab studies that have examined this topic comprehensively.

Third: Institutional Impact

Concept of Institutional Impact

Institutional performance encompasses the set of processes and activities through which an institution achieves its strategic objectives. It includes dimensions such as performance efficiency, digital transformation, adoption of emerging technologies, and competitiveness. Innovation Land Lab (2025) defined institutional impact as a set of measurable indicators that include beneficiary satisfaction, process improvement, execution speed, and quality enhancement.

According to the Oslo Manual published by the Organization for Economic Co-operation and Development (OECD, 2018), institutional innovation requires systematic frameworks that enable organizations to develop sustainable capabilities for exploration, experimentation, and implementation of new ideas, ultimately leading to improved institutional performance.

Previous Studies on the Effect of Innovation Acceleration Methodologies on Institutional Performance

The existence of a structured innovation framework is considered a prerequisite for achieving institutional excellence and sustainable performance improvement (Tidd & Bessant, 2014). Innovation methodologies provide institutions with systematic mechanisms for building sustainable capabilities related to exploration, experimentation, and implementation of new ideas (OECD, 2019).

Al-Kazem (2020) found that a training program based on the strategies of the Global AL -Madina Program, including the innovation acceleration strategy, was effective in developing performance-related skills. The results revealed statistically significant differences between the experimental and control groups in favor of the experimental group. Similarly, Al-Kazem (2023) reported a significant positive effect of the innovation acceleration strategy on the development of professional competencies, confirming the effectiveness of training programs based on this methodology in achieving their intended objectives.

Chesbrough (2010) demonstrated that organizations applying innovation acceleration mechanisms achieved market access 35% faster than comparable organizations that did not adopt such mechanisms. These findings suggest that innovation acceleration contributes to streamlining institutional processes, reducing implementation time, and enhancing organizational productivity.

Likewise, Xu, Chen, and Zhang (2018) found that concurrent thinking methodologies, which are conceptually related to innovation acceleration, reduced project completion time by 22% and improved the efficiency of multidisciplinary teams. These findings indicate the potential contribution of innovation acceleration methodologies to improving institutional effectiveness and operational efficiency.

Chatterjee, Rana, and Dwivedi (2021) also identified a positive relationship between the adoption of innovation methodologies and the adoption of emerging technologies. Their findings revealed that organizations with clearly defined innovation methodologies were better able to leverage artificial intelligence and big data to improve service delivery and institutional performance.

In addition, Lee and Trimi (2021) reported that methodologies such as design thinking and concurrent thinking create favorable environments for experimenting with and gradually adopting emerging technologies, thereby reducing the risks associated with developing innovative solutions and supporting sustainable digital transformation.

The Saudi Ministry of Communications and Information Technology (MCIT, 2023) indicated that the implementation of structured innovation frameworks, including innovation acceleration programs combined with investments in emerging technologies, enabled Saudi institutions to develop innovative solutions and respond effectively to challenges and crises within digital transformation environments.

Similarly, the Saudi Data and Artificial Intelligence Authority (SDAIA, 2025) reported that the adoption of artificial intelligence and Internet of Things technologies was among the key factors contributing to the Kingdom's advancement in digital government indicators. These findings reinforce the importance of innovation methodologies as enabling mechanisms that facilitate the successful utilization of emerging technologies.

Furthermore, the World Economic Forum (2020) reported that institutions adopting clear innovation methodologies and advanced digital tools are more capable of improving organizational performance and achieving competitive advantage in complex and rapidly changing environments.

These findings are consistent with the results reported by Abdeen (2020), which highlighted the contribution of the Global AL -Madina Program to enhancing innovation capabilities and accelerating creative processes. They also align with the findings of Alaswd (2017), which demonstrated the effectiveness of the Global AL -Madina Program in developing Innovative Thinking skills among gifted students. Together, these studies provide cumulative evidence supporting the positive role of innovation acceleration methodologies in improving institutional capabilities, enhancing performance outcomes, and supporting innovation-driven transformation.

4.Study Hypotheses

Main Hypothesis

H_1: There is no statistically significant relationship at the significance level **($\alpha \leq 0.05$)** between the innovation acceleration methodology and: **(a) the development of innovative solutions, and (b) institutional impact within government entities.**

Sub-Hypotheses

H_{01}: The innovation acceleration methodology does not lead to the development of innovative solutions in government entities.

H_{02}: The innovation acceleration methodology does not achieve a positive institutional impact within government entities.

H_{03}: There are no statistically significant differences between the pre- and post-measurements in institutional performance dimensions **(time efficiency, performance efficiency, technology adoption, digital transformation, and competitiveness)** following the application of the innovation acceleration methodology.

Research Methods

Research Methodology

The present study adopted a quasi-experimental approach using a one-group pre-test and post-test design. This approach was selected because it is appropriate for measuring the effectiveness of the innovation acceleration methodology in developing innovative solutions and generating institutional impact. The design enables the assessment of changes in the study variables before and after the intervention and is particularly suitable for government environments, where the implementation of fully controlled experimental designs is often difficult.

Study Design

The study employed a quasi-experimental design based on a single group with pre- and post-measurements. The objective was to measure the impact of applying the innovation acceleration methodology on the development of innovative solutions and institutional impact within government entities.

$O_1 \rightarrow X \rightarrow O_2$

Where:

O_1: Pre-measurement using the measurement instrument before the implementation of the innovation acceleration methodology.

X: Experimental intervention (application of the innovation acceleration methodology).

O_2: Post-measurement using the same measurement instrument following the implementation of the methodology.

Study Population and Sample

Study Population

The study population consisted of employees and leaders working in Saudi government entities, including ministries, authorities, and public institutions, who are involved in innovation and digital transformation activities.

Study Sample

A stratified random sample was selected to ensure the representation of different categories of government entities (central and local government entities) within the study population. The final sample consisted of 773 participants (n = 773).

Research Instrument

Description of the Instrument

The measurement instrument was developed based on the theoretical literature and previous studies related to the research topic. The final instrument consisted of 40 items, including three demographic items related to the characteristics of the respondents.

Rating Scale

Responses were measured using a five-point Likert scale, as follows:

(5 = Strongly Agree, 4 = Agree, 3 = Neutral, 2 = Disagree, 1 = Strongly Disagree)

Validity and Reliability of Instruments

First: Instrument Validity

The validity of the instrument was established through the following procedures:

1. **Face Validity:** The instrument was submitted to **five experts** specializing in innovation, measurement, and evaluation for review. The items were revised and refined based on their feedback and recommendations.
2. **Content Validity:** The level of agreement among the reviewers was calculated and reached **0.78**, which is considered an acceptable level and provides evidence of the content validity of the instrument.

Second: Instrument Reliability

The reliability of the instrument was assessed using Cronbach's alpha coefficient based on a pilot application conducted on a sample of 83 respondents. The results indicated a Cronbach's alpha coefficient of 0.94 for the overall instrument, demonstrating a high level of internal consistency and reliability for research purposes.

The results were:

Table (1)

Cronbach's Alpha Coefficients for the Items of the Innovation Acceleration Methodology Scale and Innovation Dimensions in Institutional Work

No.	Axis	Number of Items	Cronbach's Alpha Coefficient	Reliability Level
1	Innovation Acceleration Methodology	5	0.87	High
2	Effectiveness of the Methodology in the Quality of Innovative Solutions	10	0.91	Very High
3	Impact of the Innovation Acceleration Methodology on Institutional Work			
	First Dimension: Time Efficiency	10	0.89	High

	Second Dimension: Innovative Performance Efficiency	3	0.85	High
	Third Dimension: Adoption of Emerging Technologies	3	0.83	High
	Fourth Dimension: Digital Transformation	3	0.88	High
	Fifth Dimension: Competitiveness	3	0.84	High
Total		37	0.94	Very High

Table (1) shows that the reliability coefficient values for the questionnaire axes ranged between (0.83) and (0.91), all of which are above the acceptable level (0.70), indicating that the questionnaire possesses a high degree of reliability and internal consistency. The reliability coefficient for the second axis (Effectiveness of the Methodology in the Quality of Innovative Solutions) reached (0.91), which is the highest among the axes, reflecting great homogeneity in the items of this axis. The reliability coefficient for the entire questionnaire reached (0.94), which is a very high level, confirming that the study instrument is valid for field application and possesses a high degree of internal consistency.

Study Application Process

The study was conducted according to the following procedures:

1. **Literature Review:** Reviewing the theoretical literature and previous studies related to the innovation acceleration methodology and its associated concepts.
2. **Instrument Development:** Developing the initial measurement instrument, submitting it to expert reviewers, and revising the instrument based on their feedback and recommendations.
3. **Verification of Psychometric Properties:** Applying the instrument to a pilot sample and calculating its validity and reliability indicators.
4. **Pre-Measurement:** Administering the measurement instrument to the study sample prior to the implementation of the innovation acceleration methodology.
5. **Implementation of the Experimental Intervention:** Conducting workshops and practical training activities based on the innovation acceleration methodology with the study participants**.**
6. **Post-Measurement and Data Collection:** Administering the measurement instrument after the completion of the workshop and practical application of the innovation acceleration methodology.
7. **Data Analysis:** Statistical analyses were conducted using SPSS software, and a paired-samples t-test was employed to examine differences between pre- and post-measurements.
8. **Presentation of Statistical Results:** Presenting and describing the statistical results obtained from the analyses to identify the changes resulting from the application of the innovation acceleration methodology.
9. **Discussion of Results:** Interpreting the findings in light of the theoretical framework and previous studies relevant to the research topic.

Variables of study

The study includes one independent variable, namely the innovation acceleration methodology, and two dependent variables: (1) innovative solutions development and (2) institutional impact, represented by five dimensions: time efficiency, performance efficiency, technology adoption, digital transformation, and competitiveness.

Statistical Analysis

Study data were analyzed using SPSS software. The statistical procedures included descriptive statistics, Cronbach's alpha coefficient to assess instrument reliability, and a paired-samples t-test to examine differences between the pre- and post-measurements. Hypotheses were tested at the significance level ($\alpha = 0.05$).

Delimitations of the Study

Subject Delimitations

The study is limited to examining the innovation acceleration methodology as the independent variable and its effect on innovative solutions development and institutional impact. The measurement of institutional impact is restricted to five dimensions: time efficiency, performance efficiency, adoption of emerging technologies, digital transformation, and competitiveness.

Spatial Delimitations

The study is confined to government entities in the Kingdom of Saudi Arabia, including ministries, authorities, and public institutions. Accordingly, the findings should be interpreted within the Saudi governmental context, and caution should be exercised when generalizing the results to other sectors or countries. Nevertheless, this delimitation enhances the depth of analysis and the contextual relevance of the findings.

Temporal Delimitations

The study was conducted during the year 2026. Therefore, the findings reflect the conditions prevailing during the study period and may be influenced by future economic, technological, or organizational developments. Accordingly, future longitudinal studies are recommended to examine the sustainability of the observed effects over time.

Human Delimitations

The study sample consisted of employees and leaders working in government entities. Consequently, the findings are limited to the characteristics of the selected sample and are not intended to be generalized to population groups that were not represented in the study.

5.Statistical Analysis and Results

Description of the Study Sample

Table (2)

Demographic Distribution of the Sample

Variable	Category	Frequency	Percentage
Institution Type	Central Government	412	53.3%
	Local Government	361	46.7%
Job Title	Employee	382	49.4%
	Supervisor	198	25.6%
	Department Manager	124	16.0%
	General Manager	69	8.9%
Years of Experience	Less than 5 years	186	24.1%
	5-10 years	297	38.4%
	More than 10 years	290	37.5%

Demographic data analysis

Table (2) presents the demographic characteristics of the study sample, which consisted of 773 participants working in government entities. The analysis was conducted to identify the characteristics of the sample and assess the extent to which it represents the target study population.

The results indicate that the distribution of the sample according to the type of institution included 412 participants (53.3%) from central government entities and 361 participants (46.7%) from local government entities. This balanced distribution reflects the diversity of the sample and enhances its representativeness of different categories of government institutions, thereby strengthening the generalizability of the study findings. Furthermore,

this diversity reflects the researcher's effort to capture perspectives from different organizational environments, which contributes to a more comprehensive understanding of the study variables.

Regarding job position, the Employee category represented the largest proportion of the sample, with 382 participants (49.4%), reflecting strong representation of employees directly involved in day-to-day operational activities. This was followed by the Supervisor category, with 198 participants (25.6%), then the Department Manager category, with 124 participants (16.0%), and finally the General Manager category, with 69 participants (8.9%). This distribution is consistent with the hierarchical structure typically observed in government institutions, where the number of employees generally increases at lower organizational levels. The presence of participants from multiple managerial levels enhances the comprehensiveness of the findings and provides an integrated perspective on institutional practices and innovation-related activities.

Concerning years of experience, the largest group of participants belonged to the 5–10 years category, comprising 297 individuals (38.4%). This was followed by participants with more than 10 years of experience, numbering 290 individuals (37.5%), and those with less than 5 years of experience, totaling 186 individuals (24.1%). These findings indicate that the majority of the sample (75.9%) possessed more than five years of professional experience, which enhances the credibility of the responses and suggests that participants have substantial knowledge of institutional operations and innovation-related practices. The considerable proportion of highly experienced participants further strengthens the quality of the data and provides valuable insights into the institutional effects of the innovation acceleration methodology.

Overall, the study sample demonstrates an appropriate level of diversity and balance in terms of institution type, job position, and years of experience. This diversity increases confidence in the study findings and supports their relevance to the target population. In addition, the predominance of participants with medium to extensive professional experience enhances the reliability of the collected data, as their evaluations are likely to be based on practical experience and direct involvement in institutional processes rather than theoretical assumptions.

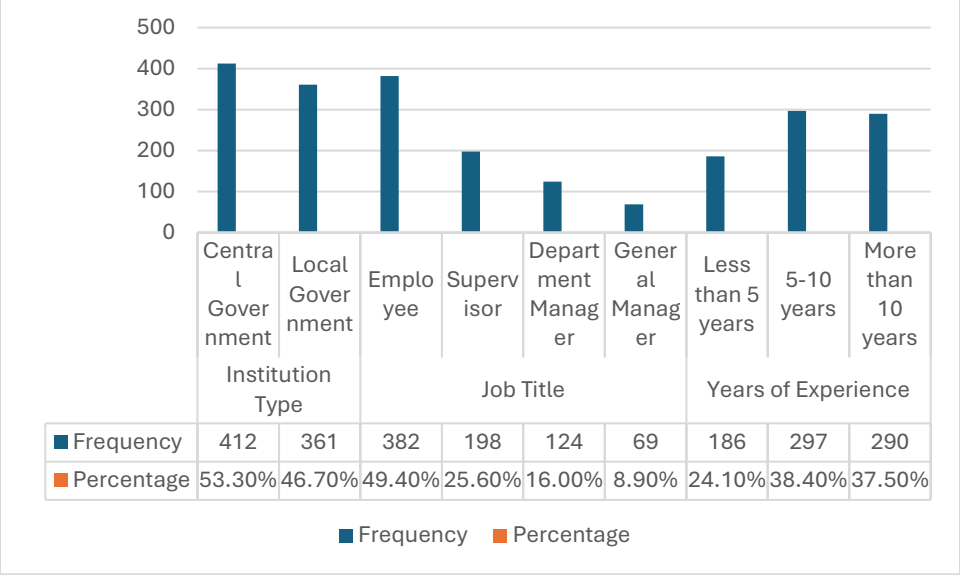

Figure (1)

Demographic Distribution of the Sample

Statistical Analysis and Results

Research Question One: Does the innovation acceleration methodology lead to the development of innovative solutions in government entities?

Null Hypothesis H_{01}:
The innovation acceleration methodology does not lead to the development of innovative solutions in government entities.

Statistical Test: Paired Samples T-test

Table (3)

Arithmetic Means, Standard Deviations, and T-Value for the Development of Innovative Solutions

Measurement	Arithmetic Mean	Standard Deviation	T-Value	Degrees of Freedom	Significance Level
Pre	2.48	0.52	14.27	84	0.001
Post	4.21	0.46	14.27	84	0.001

Table (3) shows the arithmetic means in the pre- and post-measurements. The arithmetic mean for the development of innovative solutions in the pre-measurement was (2.48), while it reached (4.21) in the post-measurement, with a difference of (1.73) in favor of the post-measurement. The calculated T-value was (14.27) which is greater than the tabulated T-value (1.99) at degrees of freedom (84), indicating a real difference between the two measurements.

Since the significance level (0.001) is less than (0.05), the null hypothesis (H_{01}) is rejected and the alternative hypothesis is accepted, which states that the innovation acceleration methodology leads to the development of innovative solutions in government entities.

Research Question Two: Does the innovation acceleration methodology achieve a positive institutional impact in government entities?

Null Hypothesis H_{02}:

The innovation acceleration methodology does not achieve a positive institutional impact in government entities.

Statistical Test: Paired Samples T-test

Table (4)

Arithmetic Means, Standard Deviations, and T-Value for Overall Institutional Impact

Measurement	Arithmetic Mean	Standard Deviation	T-Value	Degrees of Freedom	Significance Level
Pre	2.35	0.48	12.63	84	0.001
Post	3.92	0.44	12.63	84	0.001

It is evident from Table (4) that the arithmetic mean for the overall institutional impact in the pre-measurement was (2.35), which is a relatively low level, while it reached (3.92) in the post-measurement, which is a high level, with a difference of (1.57) in favor of the post-measurement. The calculated T-value was (12.63), which is greater than the tabulated T-value (1.99) at degrees of freedom (84), indicating a real, statistically significant difference between the two measurements.

Research Question Three: Are there statistically significant differences between the pre- and post-measurements in institutional performance (time efficiency, performance efficiency, technology adoption, digital transformation, competitiveness) after applying the innovation acceleration methodology?

Null Hypothesis H_{03}:

There are no statistically significant differences between the pre- and post-measurements in institutional performance after applying the innovation acceleration methodology.

Statistical Test: Paired Samples T-test

Table 5

Arithmetic Means, Standard Deviations, and T-Values for the Dimensions of Institutional Impact

Dimension	Measurement	Mean	Standard Deviation	T-Value	Degrees of Freedom	Significance Level
Time Efficiency	Pre	2.28	0.51	15.82	84	0.001
	Post	4.18	0.44	15.82	84	0.001
Performance Efficiency	Pre	2.45	0.49	13.94	84	0.001
	Post	4.05	0.42	13.94	84	0.001
Technology Adoption	Pre	2.32	0.53	12.87	84	0.001
	Post	3.88	0.47	12.87	84	0.001
Digital Transformation	Pre	2.41	0.50	14.56	84	0.001
	Post	4.12	0.45	14.56	84	0.001
Competitiveness	Pre	2.38	0.52	1.85	84	0.068
	Post	2.51	0.49	1.85	84	0.068

Table (5) indicates that the arithmetic mean for time efficiency in the pre-measurement was (2.28) and in the post-measurement it was (4.18), and the difference was (1.90) in favor of the post-measurement. The T-value obtained was (15.82) which is greater than the T-value in the table (1.99) and the level of significance was (0.001) which is less than (0.05) indicating a statistically significant improvement in the time efficiency.

The arithmetic mean for innovative performance efficiency in the pre-measurement was (2.45), and in the post-measurement was (4.05), with a difference of (1.60) in favor of the post-measurement. The calculated T value (13.94) is greater than the tabulated T value (1.99) and the significance level (0.001) is less than (0.05). This means there is a statistically significant improvement in innovative performance efficiency.

The arithmetic mean of adoption of emerging technology was (2.32) in pre-measurement and (3.88) in post-measurement, with a difference of (1.56) in favor of post-measurement. The calculated value of T was (12.87) which is greater than the tabular value of T (1.99) and the level of significance was (0.001) which is less than (0.05) which indicated that there is a statistically significant improvement in emerging technology adoption.

The table also indicates that the arithmetic mean for digital transformation in the pre-measurement was (2.41), and in the post-measurement (4.12), with a difference of (1.71) in favor of the post-measurement. The calculated T-value was (14.56) which is greater than the tabulated T-value (1.99) and the significance level was (0.001) which is less than (0.05), indicating a statistically significant increase in digital transformation.

On the other hand, the arithmetic mean of competitiveness in the pre-measurement was (2.38) and in the post-measurement (2.51) with a difference of (0.13) in favor of the post-measurement. The calculated value of T was (1.85) which is less than the tabular value of T (1.99). The level of significance was (0.068) which is greater than (0.05) which indicates that there are no statistically significant differences in competitiveness.

Table (6)

Summary of Hypothesis Testing Results

Hypothesis	Statement of Hypothesis	Result (Rejected/ Accepted)	Significance Level
H_{01}	The methodology does not lead to the development of innovative solutions	Rejected	0.001

H_{02}	The methodology does not achieve a positive institutional impact	Rejected	0.001
H_{03}	There are no differences in institutional performance across the five dimensions	Partially Rejected	-
	Time Efficiency	Rejected	0.001
	Innovative Performance Efficiency	Rejected	0.001
	Emerging Technology Adoption	Rejected	0.001
	Digital Transformation	Rejected	0.001
	Competitiveness	Accepted	0.068

Table (7)

Final Summary of Results

Element	Result
Development of Innovative Solutions	Improved
Speed of Transforming Ideas into Innovative Solutions	Statistically significant differences exist
Overall Institutional Impact	Positive
Improvement in Time Efficiency	Improved
Improvement in Performance Efficiency	Improved
Improvement in Technology Adoption	Improved
Improvement in Digital Transformation	Improved
Improvement in Competitiveness	Not improved

6. Conclusions

• The innovation acceleration methodology was found to be effective in facilitating the development of innovative solutions within government entities.

• The innovation acceleration methodology generated a positive overall institutional impact across government entities.

• Statistically significant improvements were observed in time efficiency, innovative performance efficiency, technology adoption, and digital transformation.

• No statistically significant improvement was observed in the competitiveness dimension during the study period.

Discussion and Interpretation of the Results

The results are discussed and interpreted in light of the theoretical framework and previous studies upon which the present study is based. The discussion is organized according to the study's research questions and hypotheses, linking each finding to the relevant literature and providing objective interpretations. This approach contributes to answering the central research question concerning the effectiveness of the innovation acceleration methodology in developing innovative solutions and generating institutional impact within government entities.

First: Discussion of the Results Related to the Development of Innovative Solutions

The results indicate that the innovation acceleration methodology contributes significantly to the development of innovative solutions within government entities. When innovation teams operate under clearly defined

time constraints and engage in structured cycles of training and repetition, they develop greater awareness of the value of time and become more capable of transforming ideas into practical solutions within shorter periods.

This finding is supported by the literature, as Tidd and Bessant (2014) argue that institutions adopting structured innovation management methodologies are better positioned to transform ideas into tangible outcomes. The innovation acceleration methodology provides a systematic framework that reduces delays in innovation processes and encourages continuous experimentation, thereby increasing the likelihood of generating applicable and high-quality innovative solutions.

This result is consistent with the findings of Abdeen (2020), which demonstrated that the innovation acceleration approach contributes to performance improvement and reduces completion time. It also aligns with the findings of Al-Kazem (2020), who confirmed the effectiveness of training programs based on Innovation Acceleration strategies in enhancing skills and improving performance outcomes. Similarly, Chesbrough (2010) reported that organizations adopting innovation acceleration mechanisms were able to bring products and services to market more rapidly than organizations relying on conventional innovation processes.

Second: Discussion of the Results Related to Institutional Impact

The findings revealed that the innovation acceleration methodology generated a positive institutional impact within government entities. This impact was reflected through improvements in several organizational dimensions, particularly time efficiency, innovative performance efficiency, technology adoption, and digital transformation.

The positive institutional impact can be explained by the fact that innovation acceleration does not operate as an isolated intervention; rather, it interacts with multiple elements of the organizational environment. When government entities adopt this methodology, it introduces new operational dynamics that influence several organizational levels simultaneously:

• At the individual level: increasing awareness of the importance of time utilization and performance improvement.

• At the team level: enhancing coordination, collaboration, and collective problem-solving capabilities.

• At the organizational level: improving operational processes, increasing productivity, and accelerating decision-making.

These cumulative effects contribute to broader institutional improvements across multiple dimensions of organizational performance.

This interpretation is consistent with the findings of the Innovation Land Lab (2025), which reported that institutions adopting innovation methodologies achieved superior results in digital transformation indicators. It is also supported by Chatterjee, Rana, and Dwivedi (2021), who found that organizations with clearly defined innovation methodologies were better able to leverage artificial intelligence and big data technologies to improve service delivery and institutional performance.

Third: Discussion of the Results Related to Variations in Institutional Impact Dimensions

The results revealed a differentiated impact of the innovation acceleration methodology across the five dimensions of institutional impact. Statistically significant improvements were observed in four dimensions: time efficiency, innovative performance efficiency, technology adoption, and digital transformation. In contrast, no statistically significant improvement was observed in the competitiveness dimension.

This variation can be explained through several factors. First, the methodology places strong emphasis on reducing completion time, improving workflows, and enhancing operational performance. Consequently, its effects become visible relatively quickly in dimensions directly associated with internal processes, such as time efficiency, performance efficiency, and digital transformation.

Second, although technology adoption improved significantly, the successful implementation of emerging technologies depends not only on innovation methodologies but also on additional organizational enablers such as technological infrastructure, leadership support, resource availability, and organizational readiness.

Third, competitiveness is inherently a long-term outcome that often requires extended periods before measurable changes become visible. Competitiveness is influenced by multiple external and internal factors, including institutional reputation, strategic positioning, policy frameworks, stakeholder perceptions, and comparative

performance relative to peer organizations. Therefore, improvements in innovation performance may not immediately translate into measurable gains in competitiveness within the relatively short duration of the study.

This interpretation is consistent with the findings of Chatterjee, Rana, and Dwivedi (2021), who emphasized that the success of innovation methodologies depends heavily on organizational context and supporting conditions and that their effects may vary across performance dimensions. The findings also align with Alaswd (2017), whose study demonstrated that the Global AL -Madina Program produced varying levels of impact across different Innovative Thinking skills, including originality, fluency, flexibility, and elaboration. These findings suggest that variation in impact across dimensions is a natural and expected phenomenon when evaluating complex innovation interventions.

Recommendations

Based on the findings of the study and the conclusions reached, the following recommendations are proposed:

1. Institutionalize the innovation acceleration methodology within government entities by adopting it as a formal framework for innovation management, given its demonstrated effectiveness in developing innovative solutions and generating positive institutional impact.
2. Design and implement specialized training programs based on the core principles of the innovation acceleration methodology, particularly repetition, continuous practice, and time-constrained task execution, to enhance employees' innovation capabilities and performance efficiency.
3. Promote an organizational culture that supports innovation by simplifying procedures, reducing bureaucratic barriers, providing adequate financial and technological resources, and actively involving employees in innovation-related decision-making processes. Such efforts would enhance the effectiveness of the methodology and facilitate its impact across a broader range of institutional dimensions.
4. Adopt longitudinal and time-based performance indicators to monitor innovation outcomes and assess the long-term effectiveness of innovation acceleration initiatives within government entities.
5. Encourage future research to examine additional factors that may influence the effectiveness of the innovation acceleration methodology, including organizational culture, leadership support, resource availability, employee engagement, and organizational readiness for innovation.
6. Integrate innovation acceleration initiatives with digital transformation strategies and facilitate the exchange of best practices among government entities to support the scaling and sustainability of innovation efforts across the public sector.

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