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EXPLORING HOW DIGITAL PLATFORMS, BIG DATA, AND ARTIFICIAL INTELLIGENCE SHAPE ORGANIZATIONAL INNOVATION: A QUALITATIVE MULTIPLE-CASE STUDY

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ABSTRACT

Digital transformation is reshaping organizational innovation through the growing integration of digital platforms, Big Data, and Artificial Intelligence (AI). Despite increasing scholarly attention to these technologies, limited research has examined how their interrelationships shape organizational innovation, particularly in emerging economies. In this study, we investigate the interplay of digital platforms, Big Data, and AI in shaping innovation within Moroccan organizations. Drawing on the Resource-Based View and the Dynamic Capabilities View, our study adopts a qualitative multiple-case design involving six Moroccan organizations across public, private, and public–private institutional settings. Semi-structured interview data are analysed using a hybrid deductive–inductive approach, combining open, axial, and selective coding with within-case and cross-case analyses. In this analysis, we examine how digital platforms support data-related activities, how Big Data contributes to AI implementation, and how these interconnected processes relate to organizational innovation. It also explores variations in innovation pathways across institutional settings. The study aims to advance understanding of technological interdependencies and their implications for digital innovation in emerging economies.

Keywords: Digital Platforms, Big Data, Artificial Intelligence, Organizational Innovation, Dynamic Capabilities, Multiple-Case Study.

INTRODUCTION

Digital transformation has become a central concern for organizations seeking to enhance innovation, improve operational efficiency, and respond to rapidly evolving technological environments. The increasing adoption of digital platforms, Big Data, and Artificial Intelligence (AI) is transforming how organizations manage information, coordinate activities, make decisions, and develop new products, services, and business models. Digital technologies are consequently no longer considered merely operational tools but strategic resources capable of reshaping organizational processes and innovation practices. Yoo *et al.,* (2010) emphasize that digital technologies introduce new possibilities for organizing innovation, while Bharadwaj *et al.,* (2013) highlight their growing integration into organizational strategy. Similarly, Nambisan *et al.,* (2017) argue that digitalization challenges traditional assumptions regarding innovation processes, organizational boundaries, and value creation. These developments underline the importance of understanding how digital technologies contribute to organizational innovation.

Among these technologies, digital platforms play a fundamental role by facilitating connectivity, interoperability, information exchange, and collaboration across organizational activities. They provide technological infrastructures through which organizations can integrate applications, coordinate processes, and develop innovative services. However, the organizational value of digital platforms extends beyond their technical characteristics. Cenamor *et al.,* (2019) demonstrate that digital platform capability contributes to organizational performance through complementary capabilities, suggesting that technological investments do not automatically generate organizational benefits. Rather, their contribution depends on how organizations integrate digital platforms into existing activities and mobilize the resources necessary to exploit their potential. Digital platforms may therefore constitute an important foundation for developing additional technological capabilities and supporting organizational innovation.

The expansion of digital platforms is closely associated with the increasing generation, circulation, and availability of organizational data. Through interconnected applications, digital transactions, and integrated information systems, organizations accumulate substantial data resources that can potentially support knowledge creation and decision-making. Nevertheless, data availability alone does not guarantee organizational value. Organizations must develop appropriate mechanisms for data integration, quality management, governance, and analysis. Gupta and George (2016) emphasize that Big Data Analytics Capability relies on the combination of technological, human, and organizational resources rather than simply possessing large datasets or analytical tools. Furthermore, Mikalef *et al.,* (2019) demonstrate that Big Data Analytics Capability can contribute to innovation through dynamic capabilities. These findings suggest that Big Data may play an important role in connecting digital infrastructures with more advanced technological applications and innovation processes.

Artificial Intelligence represents another important dimension of digital transformation. Its applications increasingly support prediction, intelligent automation, organizational learning, and data-driven decision-making. Davenport and Ronanki (2018) identify several organizational applications of AI, including process automation and cognitive insight. However, implementing AI effectively requires more than acquiring algorithms or technological solutions. Organizations must combine technological infrastructures, reliable data resources, specialized expertise, and appropriate organizational practices. Mikalef and Gupta (2021) conceptualize AI capability as the organizational ability to select, orchestrate, and leverage AI-related resources, demonstrating its relevance to organizational creativity and performance. Their research highlights the importance of understanding AI as an organizational capability whose contribution depends on the effective integration of complementary resources.

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Although digital platforms, Big Data, and AI have attracted considerable scholarly attention, their relationships are frequently examined within separate research streams. Existing studies have investigated digital platform capabilities (Cenamor *et al.,* 2019), Big Data Analytics Capability (Gupta & George, 2016), the relationship between Big Data and innovation (Mikalef *et al.,* 2019), and AI capability (Mikalef & Gupta, 2021). However, these contributions provide limited insight into how the three technological domains interact within a common organizational innovation process. Digital platforms may facilitate data integration and accessibility, Big Data may provide analytical foundations for AI applications, and AI may enable organizations to transform these resources into innovative products, services, and processes. Nevertheless, these relationships should be examined empirically rather than assumed to follow a universal sequence. Understanding their interactions therefore represents an important research opportunity.

The Resource-Based View (RBV) and Dynamic Capabilities View (DCV) offer complementary theoretical foundations for investigating these technological relationships. The RBV emphasizes the strategic importance of valuable organizational resources (Barney, 1991), while the DCV focuses on organizations' ability to integrate, develop, and reconfigure resources in changing environments (Teece *et al.,* 1997). Together, these perspectives suggest that organizational innovation depends not only on technological adoption but also on the processes through which complementary digital resources are combined and mobilized. This capability-based perspective provides a theoretical basis for examining how digital platforms, Big Data, and AI may collectively contribute to innovation.

The Moroccan context provides a relevant setting for investigating these relationships. As an emerging economy, Morocco offers opportunities to examine digital transformation across organizations operating under different institutional arrangements, technological conditions, and innovation priorities. Examining public, private, and public–private organizations may reveal similarities and differences in how digital technologies are integrated and mobilized for innovation. Accordingly, this study addresses the following research question:

How do digital platforms, Big Data, and Artificial Intelligence interact to shape organizational innovation in Moroccan organizations?

To address this question, the research adopts a qualitative multiple-case study involving six Moroccan organizations: Bank Al-Maghrib, ANCFCC, OMPIC, Omnidata, Exia Technologies, and PortNet. Drawing on semi-structured interviews, the study employs a hybrid deductive–inductive thematic approach supported by within-case and cross-case analyses. The investigation focuses on the relationships among digital platforms, Big Data, AI, and organizational innovation, including product, process, and business model innovation and innovation speed.

This study seeks to contribute to the literature in three ways. First, it develops an integrated perspective on the relationships among digital platforms, Big Data, and AI. Second, it extends capability-based explanations of organizational innovation by examining how complementary technological resources may be combined. Third, it provides qualitative evidence from Moroccan organizations, contributing to a more context-sensitive understanding of digital innovation. The remainder of the article presents the literature review, conceptual model, empirical methodology and findings, discussion, and conclusion.

LITERATURE REVIEW

Digital Platforms and Organizational Innovation

Digital platforms have become important components of organizational digital transformation, providing technological foundations for connectivity, information exchange, and the integration of organizational activities. Unlike isolated information systems, digital platforms facilitate interactions among applications, processes, and organizational actors, enabling new forms of coordination, collaboration, and value creation. Yoo *et al.,* (2010) emphasize that digital technologies introduce a new organizing logic characterized by the recombination of technological components and the emergence of distributed innovation processes. Similarly, Gawer (2014) highlights the importance of technological platforms as organizational arrangements that support interactions and innovation across interconnected actors.

The contribution of digital platforms to organizational innovation extends beyond their technological characteristics. Their potential value depends on how organizations integrate platform functionalities into existing processes and mobilize complementary resources. Cenamor *et al.,* (2019) demonstrate that digital platform capability contributes to organizational performance through network capability and organizational ambidexterity. This finding suggests that platform-related benefits are not necessarily direct but may emerge through complementary organizational mechanisms. Digital platforms can consequently support innovation by facilitating access to information, improving collaboration, and enabling the development of new products, services, and operational practices.

Digital platforms may also create conditions favorable to data-intensive organizational activities. Through the integration of applications and processes, they can facilitate the collection, circulation, and accessibility of information across organizational functions. Such integration may reduce information fragmentation and support the development of analytical activities. However, platform integration does not automatically guarantee effective data utilization. Organizations must establish appropriate practices for managing and exploiting the information generated through digital interactions. This distinction is particularly relevant when examining the relationship between digital platforms and Big Data, since technological connectivity may provide an important foundation for data-related activities without necessarily ensuring their effective implementation.

From an innovation perspective, digital platforms may influence both the development of new offerings and the transformation of organizational processes. Nambisan *et al.,* (2017) argue that digitalization changes the boundaries, participants, and processes of innovation, creating opportunities for more distributed and interconnected innovation activities. Accordingly, understanding the contribution of digital platforms requires examining their interactions with other technologies and the organizational practices through which technological resources are transformed into innovation outcomes.

Big Data and Artificial Intelligence in Organizations

Big Data has emerged as an important dimension of organizational digital transformation because of the increasing availability of information generated through digital systems, transactions, and connected activities. Its organizational relevance extends beyond the volume of available data to include the ability to integrate, manage, analyze, and transform information into actionable knowledge. Gupta and George (2016) conceptualize Big Data Analytics Capability as a

combination of tangible, human, and intangible resources, emphasizing that analytical value depends on organizational capabilities rather than technological investments alone.

The relationship between Big Data and organizational innovation has attracted growing scholarly attention. Mikalef *et al.,* (2019) demonstrate that Big Data Analytics Capability contributes to incremental and radical innovation capabilities through dynamic capabilities. Their findings indicate that the innovation-related benefits of data analytics may depend on intermediate organizational processes that enable organizations to identify opportunities, mobilize resources, and respond to changing environments. Similarly, Wamba *et al.,* (2017) examine the contribution of Big Data Analytics to organizational performance, highlighting the importance of dynamic capabilities in realizing its potential value.

Artificial Intelligence represents a complementary technological domain through which organizations can develop advanced analytical and decision-making applications. AI technologies may support prediction, automation, knowledge generation, and the identification of patterns that are difficult to detect through conventional analytical approaches. Davenport and Ronanki (2018) identify process automation, cognitive insight, and cognitive engagement as important categories of organizational AI applications. These applications illustrate how AI can contribute to the transformation of organizational activities and potentially support innovation.

Nevertheless, the effective implementation of AI requires the integration of multiple organizational resources. Mikalef and Gupta (2021) conceptualize AI capability as the ability to select, orchestrate, and leverage AI-specific resources, including technological infrastructure, data, human expertise, and organizational resources. Their empirical research demonstrates the relevance of AI capability to organizational creativity and performance. This perspective suggests that AI-related benefits depend on how organizations combine technological and complementary resources rather than on the acquisition of AI applications alone.

Big Data and AI may therefore be understood as interconnected technological domains. Data integration, quality, accessibility, and governance can provide important foundations for AI applications, while AI may expand organizations' ability to exploit data resources for prediction, decision-making, and innovation. However, their relationship is not necessarily uniform across organizations. Different technological configurations, resource conditions, and implementation practices may influence how data-related activities support AI development and how AI applications contribute to organizational outcomes.

Interconnected Digital Technologies and Organizational Innovation

Although digital platforms, Big Data, and AI have been examined extensively, their interconnected contribution to organizational innovation remains an important area for further investigation. Existing studies have primarily emphasized specific technological capabilities or selected relationships between digital technologies and organizational outcomes. Cenamor *et al.,* (2019) investigate digital platform capability and complementary organizational mechanisms, Gupta and George (2016) examine the resources underpinning Big Data Analytics Capability, and Mikalef and Gupta (2021) explore the organizational implications of AI capability. These contributions provide valuable insights but do not, individually, establish how the three technological domains interact within a common innovation process.

The Resource-Based View and Dynamic Capabilities View offer complementary perspectives for examining these relationships. Barney (1991) emphasizes the strategic significance of organizational resources, while Teece *et al.,* (1997) highlight organizations' ability to integrate, build, and reconfigure competencies in changing environments. Applied to digital transformation, these perspectives suggest that innovation may emerge through the combination and progressive development of complementary technological resources.

Digital platforms may provide infrastructures that facilitate data generation, accessibility, and integration. Big Data practices may subsequently support the development of reliable analytical resources, while AI applications may enable organizations to exploit these resources through advanced decision-making and automation. Such interactions could contribute to product and service innovation, process innovation, business model innovation, and innovation speed. However, this potential progression should be treated as an analytical possibility rather than a universal technological sequence.
Mikalef *et al.,* (2019) reinforce the importance of examining intermediate mechanisms by demonstrating that the contribution of Big Data Analytics Capability to innovation operates through dynamic capabilities. Similarly, Nambisan *et al.,* (2017) emphasize the need for research approaches capable of capturing the interconnected and evolving nature of digital innovation. These perspectives support investigating how technological resources are combined within actual organizational settings.

Consequently, further empirical research is needed to explain how digital platforms, Big Data, and AI interact and how these interactions relate to organizational innovation. Examining organizations operating under different institutional conditions may reveal common technological pathways as well as alternative configurations. A qualitative multiple-case investigation in Morocco offers an opportunity to explore these relationships and develop a context-sensitive understanding of how interconnected digital technologies contribute to organizational innovation.

DEVELOPMENT OF HYPOTHESIS AND CONCEPTUAL MODEL

Building on the Resource-Based View (RBV) and the Dynamic Capabilities View (DCV), our study develops an integrated conceptual model to examine how digital platforms, Big Data, and Artificial Intelligence (AI) contribute to organizational innovation. The RBV emphasizes the strategic importance of valuable organizational resources (Barney, 1991), while the DCV highlights organizations' ability to integrate, develop, and reconfigure resources in changing environments (Teece *et al.,* 1997). Together, these perspectives suggest that innovation depends not merely on technological adoption but on the development and combination of complementary digital capabilities. Accordingly, the proposed model comprises four principal constructs: Digital Platform Capability (DPC), Big Data Capability (BDC), Artificial Intelligence Capability (AIC), and Innovation Outcomes (INN).

Digital Platform Capability refers to an organization's ability to integrate and leverage digital platforms to facilitate information accessibility, interoperability, collaboration, process automation, and scalability. Digital platforms can support innovation by connecting organizational activities, improving coordination, and enabling new products, services, and operational practices. Cenamor *et al.,* (2019) demonstrate that digital platform capability can generate organizational benefits through complementary capabilities. Beyond these indirect mechanisms, platform-enabled connectivity and collaboration may contribute directly to innovation by facilitating

knowledge exchange and the development of new organizational solutions. Therefore, the first proposition is formulated as follows:

P1: Digital Platform Capability positively contributes to Organizational Innovation Outcomes.

Digital platforms may also provide the technological foundations necessary for developing Big Data Capability. By integrating applications and organizational processes, digital platforms facilitate data generation, accessibility, exchange, and consolidation. However, the effective exploitation of these resources requires appropriate data integration, quality management, and governance practices. Gupta and George (2016) emphasize that Big Data Analytics Capability depends on the combination of technological, human, and organizational resources. From this perspective, Digital Platform Capability may facilitate the development of Big Data Capability by improving the availability and integration of organizational information. Accordingly:

P2: Digital Platform Capability positively contributes to the development of Big Data Capability.

Big Data Capability represents an organization's ability to integrate, govern, manage, and exploit extensive data resources to support analytical activities and organizational decision-making. These capabilities may provide an important foundation for the development of Artificial Intelligence Capability. AI applications frequently depend on accessible, reliable, and appropriately managed data resources for model development, prediction, and intelligent automation. Nevertheless, effective AI implementation also requires specialized expertise, technological infrastructure, and organizational integration. Mikalef and Gupta (2021) emphasize the importance of orchestrating complementary AI-related resources to generate organizational value. Thus, the development of Big Data Capability may facilitate AI implementation by strengthening the organization's data foundations. This relationship leads to the third proposition:

P3: Big Data Capability positively contributes to the development of Artificial Intelligence Capability.

Artificial Intelligence Capability refers to an organization's ability to mobilize AI-related expertise, technological infrastructure, and operational applications to support decision-making, automation, and knowledge generation. AI may contribute to organizational innovation by facilitating the identification of opportunities, improving processes, and supporting the development of new products, services, and business models. Mikalef and Gupta (2021) demonstrate the relevance of AI capability to organizational creativity and performance, while Davenport and Ronanki (2018) highlight its potential for transforming organizational activities. Accordingly:

P4: Artificial Intelligence Capability positively contributes to Organizational Innovation Outcomes.

Beyond these individual relationships, the proposed model considers a potential sequential pathway connecting digital platforms, Big Data, AI, and innovation. Digital platforms may facilitate data integration, Big Data Capability may strengthen the foundations for AI implementation, and Artificial Intelligence Capability may support the transformation of technological resources into innovation outcomes. Mikalef *et al.,* (2019) demonstrate the importance of intermediate capability-related mechanisms in the relationship between Big Data Analytics and innovation. Extending this reasoning, the present study proposes that digital capabilities may contribute to innovation through an interconnected process of capability development. Consequently:

P5: Digital Platform Capability contributes to Organizational Innovation Outcomes through the sequential development of Big Data Capability and Artificial Intelligence Capability.

Innovation Outcomes encompass product and service innovation, process innovation, business model innovation, and innovation speed. The proposed relationships are examined through a qualitative multiple-case study of six Moroccan organizations. Rather than statistically testing mediation or establishing causal effects, the research investigates whether and how the proposed technological relationships are reflected in organizational practices, experiences, and innovation processes. This approach also allows the identification of alternative pathways and contextual variations that may refine the conceptual model.

- **Conceptual model:**

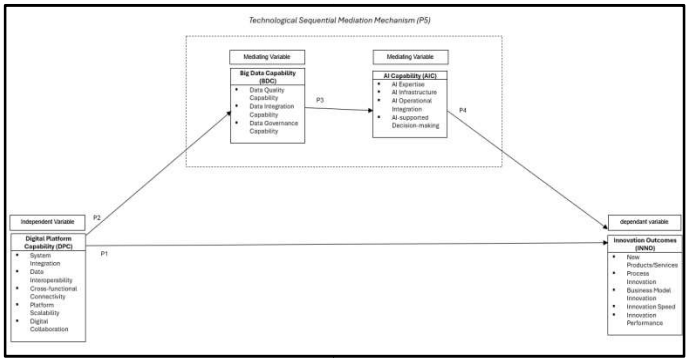


Fig.1.Conceptual model (Own Elaboration)

In this study, we propose this innovative conceptual model where we resume variables that we have defined and different relationships and propositions that we have investigated.

EMPIRICAL STUDY

Research Design and Methodology

This research adopts a qualitative multiple-case study design to investigate how Digital Platform Capability (DPC), Big Data Capability (BDC), and Artificial Intelligence Capability (AIC) interact to shape Innovation Outcomes (INN) in Moroccan organizations. Multiple-case research is particularly appropriate for investigating complex organizational phenomena and developing explanations grounded in contextual evidence (Eisenhardt, 1989; Yin, 2018). The study follows an interpretive orientation (Walsham, 1995) and an abductive logic, allowing theoretical propositions to be examined and refined through empirical observations (Dubois & Gadde, 2002).

Six organizations were purposively selected to capture institutional and technological diversity: ANCFCC, Bank Al-Maghrib (BAM), OMPIC, Exia Technology, Omnidata, and PortNet. The sample comprises three public organizations, two private companies, and one public–private partnership. This selection follows the logic of information-rich cases, enabling comparisons across different organizational environments (Patton, 2015).

Data were collected through semi-structured interviews with senior information systems executives, including IT directors and chief information officers. The interviews explored digital platform integration, data management, AI development, and innovation activities. The organization constituted the primary unit of analysis, while interview accounts provided evidence of technological practices and capability-development processes.

Qualitative Data Analysis

The empirical material was analyzed using a hybrid deductive–inductive thematic approach, consistent with Fereday and Muir-Cochrane (2006). Deductive categories were derived from the conceptual framework, while inductive coding enabled additional mechanisms to emerge from interview evidence.

The analysis was supported by QualCoder and combined open coding, axial coding, and selective coding to identify concepts, examine relationships, and integrate recurring themes (Strauss & Corbin, 1998). Within-case analysis examined each organization's technological trajectory, while cross-case comparison identified common patterns and contextual variations (Eisenhardt & Graebner, 2007).

The investigation focused on five propositions: DPC–INN (P1), DPC–BDC (P2), BDC–AIC (P3), AIC–INN (P4), and the sequential DPC–BDC–AIC–INN pathway (P5). These relationships were assessed through qualitative process evidence rather than statistical hypothesis testing.

Empirical Findings

DigitalPlatform Capability and Innovation Outcomes (P1)

The six cases indicate that digital platforms contribute to organizational innovation through improved connectivity, process integration, and service delivery. This finding is consistent with Yoo *et al.,* (2010), who emphasize the recombinative potential of digital technologies, and Cenamor *et al.,* (2019), who demonstrate the organizational relevance of digital platform capability.

At ANCFCC, digital platforms transformed land registration services through integrated electronic transactions, remote document access, and automated administrative procedures. Annual certificate issuance reportedly increased from approximately 800,000–1 million to more than two million online certificates. This transformation illustrates how platform integration can support service innovation, operational scalability, and faster processing.

OMPIC similarly demonstrated platform-enabled service innovation through its digital service portfolio, including Direct OMPIC, Direct Info, and Direct Enterprise. At BAM, digital platforms supported institutional information exchange and new digital initiatives.

Private-sector cases revealed different innovation priorities. Exia Technology used integrated platforms to support multi-client operations and service scalability, while Omnidata emphasized platform integration as a foundation for innovation. PortNet's national single-window platform enabled coordination among international trade stakeholders, supporting interorganizational process innovation. These findings support **P1** while revealing sector-specific innovation patterns. Public organizations emphasized service accessibility and administrative efficiency, private companies emphasized scalability and business model development, and PortNet highlighted ecosystem coordination. This diversity aligns with Nambisan *et al.,* (2017), who argue that digitalization transforms innovation processes, participants, and organizational boundaries.

Digital Platform Capability and Big Data Capability (P2)

The analysis reveals that digital platforms provide important foundations for data generation, integration, and accessibility. However, developing Big Data Capability requires more than accumulating information. Gupta and George (2016) emphasize that Big Data Analytics Capability depends on the integration of technological, human, and organizational resources.

At ANCFCC, platform-based digitization generated substantial information resources, including more than 300 million scanned documents and approximately 8.2 million registered land titles. These developments strengthened the organization's data infrastructure while creating additional requirements for integration, governance, and analytical exploitation.

BAM's regulatory reporting platforms generated extensive financial information, while its Data Factory initiative aimed to improve data consolidation and quality. OMPIC's digital services contributed to structured intellectual property databases, creating opportunities for advanced information exploitation.

At Exia, multi-client platforms facilitated operational data generation, although differences in client data accessibility constrained integrated analysis. Omnidata experienced data quality challenges associated with legacy systems. PortNet generated extensive trade-related information through its single-window ecosystem, but data ownership arrangements limited independent exploitation.

The findings therefore support **P2** through a mechanism of *platform-driven data generation*. Digital platforms do not merely facilitate access to existing information; their operation actively produces organizational data resources. Nevertheless, the development of analytical capability depends on governance and integration practices. This distinction is consistent with the resource-based perspective of Gupta and George (2016) and the emphasis on complementary capabilities in Cenamor *et al.,* (2019).

Big Data Capability and Artificial Intelligence Capability (P3)

The relationship between Big Data and AI emerged as a recurring concern across the cases. Organizations consistently associated effective AI implementation with reliable, accessible, and appropriately governed data. This observation corresponds with Mikalef and Gupta (2021), who identify data resources, technological infrastructure, and specialized expertise as components of organizational AI capability.

At BAM, data quality represented a major obstacle to AI development. The Data Factory initiative was consequently considered an important preparatory step for more advanced applications. Omnidata similarly identified data quality as a structural constraint, suggesting that weaknesses in data management may limit subsequent AI development.

Exia demonstrated how uneven data maturity across clients can affect the development of AI applications. At PortNet, data ownership complexity restricted access to information distributed among ecosystem participants. OMPIC's transition toward strategic intelligence similarly depended on strengthening data-related capabilities.

ANCFCC provided a particularly revealing case. Despite substantial digitized information and approximately ten identified AI use cases, the organization had not implemented operational AI applications at the time of the interview. Data sovereignty requirements and the availability of compliant technological solutions were identified as major constraints.

These findings provide **qualified support for P3**. Big Data Capability constitutes an important foundation for AI development, but data volume alone is insufficient. Data quality, governance, accessibility, and sovereignty influence whether organizations can translate data resources into operational AI applications.

This interpretation extends the capability-based reasoning of Gupta and George (2016) and Mikalef and Gupta (2021) by identifying organizational and institutional barriers affecting the transition from data readiness to AI implementation.

Artificial Intelligence Capability and Innovation Outcomes (P4)

The contribution of AI capability to innovation varied substantially across the six organizations. This variation reflects differences in AI maturity, implementation practices, and operational integration.

Exia provided the clearest illustration of AI-enabled innovation. Its AI applications supported document processing and operational automation, while the development of AI-as-a-Service activities created opportunities for business model innovation. These findings are consistent with Davenport and Ronanki (2018), who identify process automation and cognitive insight as important organizational AI applications.

At Omnidata, AI was associated with operational productivity and innovation acceleration. Innovation Lab activities supported experimentation with AI-based solutions, although broader deployment remained an important consideration.

BAM, OMPIC, and PortNet exhibited emerging AI capabilities, with initiatives at exploratory, proof-of-concept, or early implementation stages. Consequently, evidence of mature AI-driven innovation was more limited.

ANCFCC represented a contrasting configuration. Although AI applications had been identified, operational deployment remained constrained by data sovereignty requirements. Its substantial service innovations were therefore primarily associated with digital platforms rather than implemented AI technologies.

Overall, *P4 receives partial qualitative support*. AI capability contributes to innovation where technological resources are effectively integrated into organizational activities, but anticipated applications cannot be treated as realized innovation outcomes.

This finding is consistent with Mikalef and Gupta (2021), who emphasize the organizational resources required to exploit AI, and with Mikalef *et al.,* (2019), who demonstrate the importance of capability-related mechanisms in translating digital technologies into innovation.

Sequential Capability Development and Innovation (P5)

The cross-case analysis identifies a recurring technological progression connecting digital platforms, data-related capabilities, AI development, and innovation. However, the sequence varies according to organizational maturity and technological constraints.

Exia and Omnidata provide relatively advanced illustrations of the proposed pathway. Digital platforms support information generation and integration, data-related capabilities facilitate AI development, and AI applications contribute to innovation-oriented activities.

BAM demonstrates a more gradual progression, with established digital infrastructures and the Data Factory initiative preceding broader AI implementation. OMPIC similarly exhibits mature platform digitization alongside developing analytical and AI capabilities.

At PortNet, extensive platform integration generates opportunities for data exploitation, but distributed data ownership complicates the transition toward advanced AI applications.

ANCFCC reveals an interruption in the proposed sequence. Its mature digital platforms and substantial data resources have supported significant service innovation, while AI deployment remains constrained. Consequently, innovation occurs through the direct platform-enabled pathway without completion of the entire technological sequence.

These findings provide *process-based support for P5*, while challenging the assumption of an automatic or universal progression. The results are consistent with Mikalef *et al.,* (2019), who demonstrate that Big Data Analytics Capability contributes to innovation through intermediate organizational capabilities. They also support the Dynamic Capabilities View, which emphasizes the integration and reconfiguration of organizational resources (Teece *et al.,* 1997; Teece, 2007).

Nevertheless, the Moroccan cases suggest that technological capability development may follow interrupted, iterative, or partially independent pathways rather than a strictly linear sequence.

Cross Case Analysis

The cross-case findings identify three principal patterns. First, Digital Platform Capability provides a common foundation for organizational innovation and data generation. Second, the transition from platform-generated information to Big Data Capability depends on data quality, integration, and governance. Third, the contribution of AI to innovation varies according to operational maturity and implementation conditions.

These patterns are consistent with the Resource-Based View, which emphasizes the organizational value of complementary resources (Barney, 1991), and the Dynamic Capabilities View, which highlights their integration and reconfiguration (Teece *et al.,* 1997).

The evidence consequently suggests two complementary innovation pathways: a *direct platform-enabled pathway*, through which digital integration supports service and process innovation, and a *sequential capability-development pathway*, through which data-related capabilities facilitate AI applications and additional innovation opportunities.

The findings indicate that these pathways may coexist. Rather than establishing a universal sequence, the study provides a contextualized explanation of how digital platforms, Big Data, and AI interact across organizations with different technological and institutional characteristics.

DISCUSSION

Digital Platforms as Foundations for Organizational Innovation

The findings demonstrate that Digital Platform Capability (DPC) constitutes an important foundation for organizational innovation across the six Moroccan organizations. Consistent with P1, digital

platforms contribute to innovation by facilitating information accessibility, process integration, collaboration, and service delivery. This finding supports previous research emphasizing the generative potential of digital technologies (Yoo *et al.,* 2010) and the organizational benefits of digital platform capabilities (Cenamor et al., 2019).

However, the results reveal that platform-enabled innovation takes different forms depending on organizational context. At ANCFCC and OMPIC, digital platforms primarily support public service innovation through administrative simplification, improved accessibility, and process automation. At Exia and Omnidata, platforms contribute to operational scalability and business model development. PortNet illustrates an ecosystem-oriented configuration in which platform integration facilitates coordination among multiple stakeholders.

These observations extend the perspective of Nambisan *et al.,* (2017) by demonstrating how the innovation potential of digital platforms materializes differently across institutional settings. They also suggest that platform-enabled innovation should not be evaluated exclusively through commercial outcomes. In public organizations, improved accessibility, transparency, and service responsiveness represent important manifestations of innovation.

Importantly, the ANCFCC case demonstrates that substantial innovation can occur through digital platforms even without operational AI implementation. This observation reinforces the relevance of the direct DPC–INN relationship and challenges explanations that treat AI adoption as a necessary condition for digital innovation.

Big Data Capability as a Bridge between Digital Platforms and AI

The findings provide support for P2 by identifying a recurring relationship between digital platform deployment and Big Data Capability development. Digital platforms facilitate information exchange and integration, but they also generate substantial data resources through their daily operation.

This observation complements Gupta and George (2016), who conceptualize Big Data Analytics Capability as a combination of technological, human, and organizational resources. The present findings suggest an additional mechanism: *endogenous data generation*, whereby platform-based transactions progressively create information resources that stimulate investment in data integration, governance, and analytical capabilities.

Nevertheless, the cases demonstrate that data accumulation does not automatically produce effective Big Data Capability. ANCFCC possesses extensive digitized information but continues to develop advanced analytical arrangements. Similarly, Omnidata and BAM identify data quality as a critical concern, while PortNet faces challenges associated with distributed data ownership.

These observations highlight the distinction between possessing data and developing the organizational ability to exploit it. From an RBV perspective, the value of data resources depends on their effective organization and combination with complementary capabilities (Barney, 1991). The findings therefore refine P2 by emphasizing data governance and integration as important mechanisms connecting digital platforms to Big Data Capability.

The Conditional Development of Artificial Intelligence Capability

The relationship between Big Data Capability and AI Capability (P3) represents a particularly important contribution of the study. Across the six cases, data-related capabilities emerge as necessary foundations for developing AI applications. However, the findings indicate that this relationship is conditional rather than automatic.

BAM and Omnidata illustrate how insufficient data quality can constrain AI development, while PortNet demonstrates the importance of information access and ownership arrangements. ANCFCC provides a distinctive example: despite substantial data resources and identified AI applications, data sovereignty requirements prevent operational deployment.

These findings complement Mikalef and Gupta (2021), who emphasize the importance of technological infrastructure, data, expertise, and organizational resources in developing AI capability. They also reveal that institutional requirements may constrain AI implementation even when important technological foundations are available.

The ANCFCC case is particularly significant because it illustrates a *data-readiness–AI-deployment gap*. This gap suggests that capability development cannot be understood solely as the accumulation of complementary resources. Organizations must also be able to deploy those resources within their institutional and regulatory environments. From a DCV perspective, the findings distinguish between identifying technological opportunities and implementing them effectively (Teece, 2007). Consequently, P3 should be interpreted as a conditional capability-development relationship influenced by data quality, governance, and sovereignty requirements.

AI Capability and the Maturity of Innovation Outcomes

The findings provide partial support for P4, indicating that the contribution of AI Capability to innovation varies according to the maturity and operational integration of AI applications.

Exia demonstrates a relatively advanced configuration in which AI supports process automation and emerging AI-as-a-Service activities. Omnidata illustrates the role of AI experimentation in operational improvement and innovation development. Conversely, BAM, OMPIC, and PortNet exhibit earlier stages of AI implementation, while ANCFCC has not yet operationalized its identified applications.

These differences are consistent with Davenport and Ronanki (2018), who distinguish organizational AI applications according to their functions, and Mikalef and Gupta (2021), who associate AI capability with organizational creativity and performance.

The present study adds a developmental perspective by suggesting that **AI maturity influences the nature of observable innovation outcomes**. Early-stage applications may primarily support experimentation and localized process improvements; whereas more developed AI capabilities can contribute to broader service and business model innovation.

This interpretation also requires distinguishing realized innovation from anticipated benefits. Identifying potential AI applications does not constitute evidence of AI-driven innovation. Accordingly, the relationship between AIC and INN should be accessed through operational implementation and observable organizational changes rather than technological intentions alone.

Rethinking the Sequential Technological Pathway

The study's central theoretical contribution concerns P5, which proposes a sequential pathway connecting Digital Platform Capability, Big Data Capability, AI Capability, and Innovation Outcomes.

The cross-case findings provide qualitative support for this pathway as an explanatory process. Digital platforms facilitate data generation and integration, Big Data Capability provides foundations for AI development, and operational AI applications may generate additional innovation opportunities.

This interpretation is consistent with Mikalef *et al.,* (2019), who demonstrate the importance of intermediate capabilities in explaining the relationship between Big Data Analytics and innovation. However, the Moroccan cases reveal that technological capability development is neither universally linear nor uninterrupted.

Exia illustrates a relatively advanced progression, while BAM and OMPIC demonstrate gradual capability development. PortNet experiences constraints associated with multi-stakeholder data governance, and ANCFCC exhibits substantial platform-enabled innovation despite an interrupted transition toward AI.

These differences suggest that the proposed sequence should be understood as a *contingent capability-development pathway*, rather than an inevitable technological progression. Moreover, the direct DPC–INN relationship can operate alongside the sequential pathway, allowing innovation to emerge before AI capability becomes operational.

The study therefore extends the DCV by illustrating how technological capabilities may develop at different speeds and how constraints can interrupt their integration (Teece *et al.,* 1997). Nevertheless, qualitative evidence does not establish statistical mediation or causal effect sizes. The contribution lies in identifying plausible mechanisms, alternative pathways, and contextual conditions.

Theoretical and Practical Implications

The findings contribute to the RBV and DCV in three respects. First, they demonstrate the importance of complementary digital capabilities rather than isolated technological resources. Second, they identify data governance and AI operational maturity as critical mechanisms in capability development. Third, they reveal that innovation can emerge through both direct platform-enabled and sequential technological pathways.

Practically, the findings suggest that organizations should prioritize integrated digital infrastructures, strengthen data quality and governance, and align AI investments with operational readiness. Public organizations managing sensitive information must additionally consider data sovereignty when planning AI applications.

Overall, the study advances a context-sensitive understanding of digital innovation in an emerging economy. It suggests that the value of digital platforms, Big Data, and AI depends not only on their individual development but also on the processes and conditions through which organizations combine and operationalize them.

CONCLUSIONS

This study investigated how digital platforms, Big Data, and Artificial Intelligence (AI) interact to shape organizational innovation in Morocco. Drawing on the Resource-Based View (RBV) and Dynamic Capabilities View (DCV), a qualitative multiple-case study was conducted across six organizations representing public, private, and public–private institutional settings. The research examined five propositions concerning the relationships among Digital Platform Capability (DPC), Big Data Capability (BDC), AI Capability (AIC), and Innovation Outcomes (INN).

The findings reveal that digital platforms constitute an important foundation for organizational innovation by facilitating information accessibility, process integration, collaboration, and service delivery. They also contribute to the development of Big Data Capability by generating and integrating organizational information. However, the transition from data resources to AI capability depends on data quality, governance, accessibility, and institutional requirements. Furthermore, AI contributes to innovation primarily when technological resources are effectively integrated into operational activities, with innovation outcomes varying according to AI maturity.
The study's principal contribution lies in identifying two complementary technological pathways to innovation. The first is a direct pathway through which Digital Platform Capability supports service, process, and business model innovation. The second is a sequential capability-development pathway in which digital platforms facilitate Big Data Capability, which subsequently supports AI development and additional innovation opportunities. Nevertheless, the findings demonstrate that this progression is neither automatic nor universally linear. Differences in technological maturity, data governance, and regulatory constraints can delay or interrupt capability development.

Theoretically, the study extends the RBV and DCV by highlighting the importance of technological complementarity, capability development, and contextual conditions in explaining organizational innovation. It also contributes empirical insights from an emerging economy, where institutional diversity influences the development and exploitation of digital technologies.

From a managerial perspective, the findings emphasize the importance of strengthening digital infrastructures, improving data quality and governance, and ensuring operational readiness before scaling AI applications. Organizations should recognize that innovation can emerge from digital platforms independently of advanced AI implementation.

This research has limitations. Its qualitative design, reliance on interviews with senior information systems executives, and focus on six Moroccan organizations constrain the transferability of findings. Moreover, the study identifies plausible technological relationships rather than establishing statistical mediation or causal effects. Future research could employ longitudinal and mixed-method approaches to examine capability development over time, assess the proposed sequential relationships quantitatively, and investigate additional institutional contexts.

Overall, the study demonstrates that organizational innovation emerges not simply from adopting digital technologies, but from developing, combining, and effectively mobilizing complementary technological capabilities.

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