

## **The role of digitization in developing startup companies: Yassir Company's experience**

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### **Abstract:**

This study examines digitization's dual role as both an internal operational tool and an external ecosystem catalyst, a mechanism poorly understood in emerging market contexts. Through a descriptive-analytical case study of Yassir, an Algerian startup founded in 2017, the research identifies three inter-organizational influence mechanisms: knowledge transfer via technical consulting, collaborative partnerships through infrastructure sharing, and competitive demonstration effects accelerating digital adoption among peer ventures. Yassir's digital infrastructure, encompassing GPS integration, AI-driven personalization, and data analytics, enabled rapid multi-service expansion while generating positive spillovers for the broader entrepreneurial ecosystem, including technical training programs and partnership opportunities for resource-constrained startups. Theoretically, the study extends digitization frameworks beyond firm-level efficiency gains to encompass ecosystem-level network externalities and knowledge diffusion dynamics. Empirically, it provides detailed documentation of these mechanisms within an understudied Arab market characterized by regulatory challenges and institutional constraints. Findings indicate that entrepreneurs should leverage digitization as a knowledge-sharing platform, while policymakers should design support mechanisms that incentivize collaborative digital initiatives to accelerate collective ecosystem development.

**Keywords:** digitization, entrepreneurial ecosystems, knowledge spillovers, emerging markets, Algeria.

**JEL Classification:** O33; O55; L26; M13; L86

## **Introduction**

Accelerating technological advancement has established digitization as a key driver reshaping the global economy, particularly by enabling startups to achieve rapid growth and efficient market access. Digital transformation tools have facilitated innovative business models that allow emerging ventures to attain measurable success within compressed timelines.

Within this digitally-enabled landscape, a distinct phenomenon has emerged: certain recently established startups exert influence extending beyond their immediate operations by contributing to peer venture development through collaboration opportunities, technical support, and knowledge transfer. Among the most prominent examples in the Arab world is Yassir, an Algerian startup founded in 2017 that leveraged digital platforms in the transportation and delivery sectors to expand operations while simultaneously generating positive spillover effects within the surrounding entrepreneurial ecosystem.

Despite growing recognition of digitization's role in individual startup growth, the mechanisms through which digitization enables inter-organizational influence within shared ecosystems remain poorly understood. Existing literature predominantly focuses on digitization as an internal operational tool, neglecting its potential as an ecosystem-level catalyst that facilitates knowledge diffusion and collaborative dynamics among peer ventures. This theoretical gap is particularly pronounced in emerging market contexts, where institutional voids and resource constraints create distinct conditions for digital entrepreneurship. Addressing this gap, the present study examines a fundamental research question: How does digitization enable startups to influence peer venture development within shared entrepreneurial ecosystems?

Specifically, this study pursues three interrelated objectives. First, it analyzes Yassir's experience as a digitally-native startup, documenting its technological infrastructure and operational model. Second, it examines the mechanisms through which Yassir influenced peer ventures within the Algerian entrepreneurial ecosystem. Third, it elucidates digitization's dual role as both operational infrastructure and ecosystem catalyst.

This research makes two primary contributions. Empirically, it provides a detailed case analysis of digital entrepreneurship in an understudied Arab context, where institutional constraints and market conditions differ significantly from Western settings. Theoretically, it extends current understanding of digitization beyond firm-level efficiency gains to encompass ecosystem-level network externalities, offering insights

critical for policymakers designing support mechanisms and entrepreneurs navigating resource-constrained environments.

## **1- Conceptual background**

Before exploring its application and effects, it is essential to establish a clear definition of the primary concept utilized in this research

### **1-1- Conceptualizing digitization**

Digitization encompasses multiple dimensions that extend beyond mere technological conversion. At its most fundamental level, digitization represents the process of converting analog data into digital format for electronic processing, typically involving the transformation of printed texts, images, or continuous analog signals into binary digital signals (Bhichi & Majlakh, 2018). However, this technical definition captures only the surface of a more profound organizational transformation (Samir, 2006). From a functional perspective, digitization constitutes a strategic process aimed at transitioning from traditional operational modes to enhanced service delivery systems (Oueznadji, 2024). This transition manifests particularly through the abandonment of paper-based transactions in favor of electronic office systems and the transformation of public services into electronically processed administrative procedures (Hamidoush & Bouzida, 2020).

The scope of digitization transcends information technology itself, utilizing IT as an instrument to achieve broader organizational and societal objectives (Aidi, 2022). This process encompasses the conversion of diverse data types—including images, sounds, information, and paper documents—into digitally processable formats (Medkour, 2022). Consequently, digitization emerges as a comprehensive strategy for the information age, encompassing all electronic activities aimed at providing improved services to citizens, institutions, and governments while simultaneously reducing time, costs, and effort, and ensuring operational efficiency.

The strategic objectives of digitization reflect both preservation and innovation imperatives. According to Issa and Saleh (2006), digitization serves to safeguard collections from physical damage and disasters while facilitating access to contemporary services such as distance learning and specialized education (Issa & Saleh, 2006). Within developing contexts, digitization plays a critical role in bridging the digital divide by reducing intellectual production gaps between Arab nations and developed countries through high-resolution digital content creation. Furthermore, digitization

expands public access to cultural, scientific, and historical information while generating sustainable revenue through digital product distribution.

Technical advantages include efficient storage capabilities (a single DVD can contain thousands of pages) and mass access facilitation, enabling large numbers of users to simultaneously access vast document repositories through internet connectivity. Digital systems enable rapid retrieval, with document access occurring within seconds once content is digitized.

Technical implementations of digitization follow three primary modalities (Mehri, 2006). Image mode digitization involves encoding pixels with varying levels of complexity: single bytes for black-and-white images, multiple bytes for grayscale representations, or three bytes (24 bits total) for color images using RGB encoding, where each of the three primary colors (red, green, and blue) is represented by a certain number of bits. While this approach proves valuable for preserving old books and manuscripts, it eliminates text searchability and occupies substantial storage space. Text mode digitization addresses these limitations by employing optical character recognition (OCR) software to convert image pixels into searchable text, enabling direct interaction with electronic documents. This software has evolved to include dictionaries and grammatical analysis tools, making it suitable for documents containing proper names, archaic grammatical forms, or multilingual content.

Vector mode digitization, primarily utilized in computer-aided design applications, relies on mathematical calculations for display. Contemporary vector formats such as PDF, developed by Adobe in 1993, preserve document accuracy, compress file sizes for efficient internet transfer, maintain cross-platform compatibility, and ensure high-quality display and printing while allowing zooming without distortion.

The accelerating adoption of digitization reflects multiple converging factors. Rapid technological progress and the associated knowledge revolution have demonstrated practical advantages across various sectors, presenting opportunities for individuals and organizations to improve quality of life (Al-Awalamah, 2002, p. 151). The development of information technology and the internet era has created an expanding digital world characterized by enhanced knowledge accessibility and communication capabilities (Aboud, 2004). Globalization trends toward openness and integration have imposed political, economic, administrative, legal, and environmental transformations that technological advances address by connecting human societies via the internet and satellite communication. Democratic transformations calling for greater openness, freedom, and participation have raised awareness of public administration and institutional legitimacy (Al-Awalamah, 2002). Organizations

consequently face environmental demands requiring high-quality and efficient services and products, compelling countries to maintain developmental pace in an age characterized by accelerated information flows and intensified competition.

Successful digitization implementation requires coordinated resources across multiple domains (Bukhari & Yahiaoui, 2022). Financial resources prove critical for acquiring necessary equipment, maintaining devices, and addressing potential problems, with specific needs varying according to project scope and objectives. Material requirements encompass computers with sufficient memory, storage, and display capabilities; scanners for converting printed or photographic information into digital signals; digital cameras for capturing and storing photographs in digital form; and optical character recognition software for converting text into encoded data files. The human element remains crucial regardless of technological advancement, as human expertise is necessary throughout implementation phases. Legislative requirements demand attention to intellectual property rights, ensuring authors' rights are preserved when publishing on internal networks or the internet to avoid copyright infringement.

## **1-2- Digitization and Startup Development**

### **a) Administrative Transformation**

Digitization profoundly reshapes startup development across multiple organizational domains (Farah, 2021). Within administrative functions, digitization impacts organizational environment preparation and reform through electronic planning, which relies on strategic approaches to achieve objectives with decisions made through electronic systems serving various departments comprehensively. This approach utilizes knowledge systems such as decision support systems and expert systems while simplifying business processes. Electronic organization involves structural changes, shifting from hierarchical to flatter organizational forms and modifying frameworks to address traditional administrative issues through function consolidation, responsibility redistribution, and administrative unit reconfiguration.

Electronic leadership manifests through technical operational focus on internet technology and information quality improvement, fostering trust that enables technological advancement, alongside self-directed leadership requiring leaders to motivate themselves and accomplish tasks. Electronic control enables real-time monitoring through internal networks, reducing the temporal gap between deviation detection and correction. This process detects deviations as they occur through information flow and networking

among managers, employees, suppliers, and consumers, resulting in increased digital trust and loyalty that makes electronic control more relationship-based than traditional approaches.

### **b) Commercial and Marketing Dimensions**

In the commercial domain, information and communication technology emergence has catalyzed e-commerce transformation, revolutionizing commercial dealings locally and internationally among billions of internet users. Digital transformation enables e-commerce practices that impact multiple activities, including pre-sales operations, marketing and sales, business-to-government transactions, accounting, and product service and maintenance. This transformation improves trade methods and expands organizational capacity to meet customer needs while increasing customer-supplier interaction. Organizations gain access to quantitative and qualitative data about markets and competitors, with possibilities for automated real-time generation of marketing statistics and feedback from target markets. E-commerce encompasses diverse business transactions, including online shopping, search optimization, and digital navigation tools. Digital transformation reduces operational costs, including storage, marketing, and distribution expenses while facilitating access to international markets and expanding market reach. Electronic systems improve operational efficiency by saving time and reducing production cycle duration. Digital infrastructure and strategies enhance financial and marketing management as well as relationship management, improving commercial and service performance while enabling organizations to evaluate their effectiveness across multiple dimensions.

Marketing functions experience particularly pronounced digitization effects, as digital marketing bridges gaps between organizations and customers while enabling cost-effective promotion. Digital marketing provides solutions for startups unable to afford high traditional marketing costs through flexibility that allows businesses to modify offers rapidly, adding or removing products and adjusting prices and specifications in real-time. Continuous internet-enabled product and service showcasing gives startups enhanced revenue opportunities through expanded customer reach. Digital marketing provides tools for building customer relationships through direct interaction capabilities and tailored communication methods for different customer segments. Cost reduction occurs through intermediary elimination and lowered marketing expenditures via internet tools such as social media platforms and search engines, while distribution efficiency improves through streamlined processes such as order processing.

### **c) Digital Marketing Tools and Mechanisms**

Electronic marketing tools constitute essential mechanisms for startup product promotion (Farah, 2021). Website marketing serves as the foundational step, with company websites functioning as digital headquarters that provide accessible, informative platforms encouraging frequent customer engagement. Websites facilitate customer data gathering and feedback collection, contributing to product development and sales growth.

Search engine marketing improves discoverability by optimizing website content for both users and search algorithms, helping search engines understand webpage elements, including text, images, videos, and multimedia content. Social media marketing leverages platforms with billions of active users to establish direct, real-time customer communication and build relationships that drive sales. Social media's strategic value lies in developing business operations, improving company image, and creating interaction opportunities that raise product awareness while reducing marketing costs and enabling precise audience targeting. Email marketing provides rapid digital communication channels, allowing organizations to store messages in users' inboxes for convenient access. This approach attracts customers through persuasive, personalized messages based on recipient needs and preferences, with user databases proving crucial for effective targeting. Mobile marketing capitalizes on smartphone technology advancements, with device features facilitating marketing activities that address consumer needs efficiently and effectively.

## **2- Methodology**

This study adopts a descriptive-analytical methodology to examine how digitization enables startup influence within entrepreneurial ecosystems through the case study of Yassir, analyzing its digital operational mechanisms and their indirect impact on the development of the startup environment. The case study approach was selected for its capacity to provide an in-depth exploration of complex organizational phenomena within real-world contexts. Yassir, an Algerian digital startup operating in transportation and delivery services, represents a theoretically relevant case due to its emergence and growth within a resource-constrained environment characterized by regulatory challenges and limited digital infrastructure—conditions typical of emerging Arab markets.

The analysis examines Yassir's digital operational mechanisms, including technological infrastructure, platform architecture, and digital

service delivery systems, while investigating the company's organizational evolution from its founding in 2017 through its expansion into multiple service domains. Additionally, the study explores Yassir's indirect impact on the surrounding startup ecosystem, focusing on knowledge transfer processes, collaborative partnerships, and spillover effects on peer ventures. This analytical approach enables a comprehensive understanding of how digitization functions simultaneously as an operational tool and an ecosystem catalyst within the Algerian entrepreneurial context.

### **3- Results: The Yassir case**

The analysis of the Yassir case identifies the concrete mechanisms of its influence on the ecosystem. The first point focuses on its operational and technological foundations.

#### **3-1- Company Profile and Digital Infrastructure**

Yassir was established in 2017 as a digital platform focused on providing delivery and online shopping services through smartphone applications. The company aims to simplify daily life for consumers in Algeria by offering various services, including home delivery, e-commerce, and fast and secure product delivery. Yassir is considered one of the leading startups that relies on digitization and innovation to provide its services, helping to address persistent challenges in Algeria's transportation and delivery sectors.

The company employs a flexible organizational structure organized around specialized teams in technology, digital marketing, and customer service. This structure facilitates rapid response to market changes and enables continuous platform refinement. Yassir fosters collaboration with local companies and institutions to expand its service range and enhance operational capacity.

In terms of technology investment, Yassir depends on smartphone applications that provide an easy-to-use platform, allowing users to request delivery and shopping services effortlessly. The company strives to continuously improve the user experience through regular updates to the application. Digitization has played a key role in developing and expanding Yassir's activities. The mobile application enables customers to easily select the products or services they want, while the digital platform helps reduce operational costs and speed up transactions. The platform architecture incorporates artificial intelligence, which has improved service personalization and guided customers to the best available options. The use of the smart application has made Yassir one of the leading companies in its field in Algeria. This digital infrastructure functions as a strategic asset that

generates competitive advantages through efficiency gains and enhanced customer experience.

### **3-2- Ecosystem Impact and Knowledge Transfer**

Beyond its operational success, Yassir has supported several other startups through multiple mechanisms. Knowledge transfer represents a primary channel through which Yassir influences peer ventures. Yassir has helped some small companies understand digital business mechanisms and provided technical support in developing mobile applications. This knowledge diffusion occurs through both formal consulting arrangements and informal collaborative interactions, enabling resource-constrained startups to access expertise that would otherwise require substantial investment or remain inaccessible.

Yassir has collaborated with several small and medium-sized companies in delivery and service expansion, strengthening the spirit of cooperation between startups. These collaborations create mutual benefits by extending Yassir's service coverage while providing partner companies access to established digital infrastructure and customer bases. Technical consulting services represent an additional impact channel, with Yassir providing technical consulting to some early-stage companies on how to use digital and marketing solutions to reach new markets. The company has offered training courses on how to use digital technology, building technical capacity within the broader entrepreneurial community. Yassir has also built collaborative relationships with other companies working in the same or similar fields, demonstrating how digitally-enabled platforms can serve as ecosystem connectors that reduce fragmentation and enhance collective capabilities.

### **3-3- Economic and Social Contributions**

Yassir has contributed significantly to improving the digital economy in Algeria by providing innovative solutions that facilitate delivery and e-commerce in a market that is developing slowly in some areas. Yassir's services were more economical compared to traditional companies in the market, generating cost advantages for consumers. The company has created new job opportunities for many Algerian youths in delivery, as well as in information technology-related positions, thereby supporting the labor market.

Yassir has had a significant impact on improving the quality of life for consumers in Algeria, especially in major cities. The company has provided logistical solutions that help make access to products and services faster and

more efficient. Yassir has helped enhance consumer access to various products through a simple mobile application, improving access to services. Additionally, Yassir has contributed to increasing awareness of the importance of e-commerce and delivery services in Algeria, promoting e-commerce adoption and normalizing digital transactions among consumers who previously relied primarily on physical retail channels.

### **3-4- Digitization and Operational Sustainability**

By using smart applications and relying on digital platforms, Yassir has been able to expand its operations sustainably.. Digitization helps reduce operational costs and enhance work efficiency through automation of processes such as order tracking and electronic bill payments. Electronic payment systems eliminate cash handling complexities and accelerate transaction completion, improving working capital management.

Providing accurate data and analytics helps improve operations and make strategic decisions. Digital systems generate precise information on customer preferences, service performance, delivery efficiency, and resource utilization patterns. Analytics applied to these data streams inform strategic decisions regarding service expansion, resource allocation, pricing strategies, and platform feature prioritization. This data-driven approach allows Yassir to identify improvement opportunities, respond proactively to emerging challenges, and optimize operations based on empirical performance indicators. The resulting operational efficiency and adaptive capacity contribute to business model sustainability in competitive and dynamic market conditions.

### **3-5- Challenges and Constraints**

Like any startup, Yassir has faced several challenges. Competition from both large companies and other startups in the same field has intensified, requiring continuous innovation and service differentiation to maintain market position. Regulatory barriers have presented periodic obstacles, sometimes faced due to e-commerce and transportation regulations in Algeria. Navigating Algeria's regulatory environment demands ongoing engagement with authorities and adaptive business practices to align with changing legal frameworks.

In its early stages, it was difficult for Yassir to secure adequate funding for expanding its activities. These funding constraints required creative resource mobilization strategies and disciplined capital allocation to achieve growth objectives within budget limitations. These operational and financial challenges, while significant, did not prevent Yassir from contributing positively to the broader ecosystem. Despite these challenges,

Yassir represents a good example of how startups can support each other through digital innovation and technological partnerships.

#### **4- Discussion**

The empirical analysis of the Yassir case is situated within the conceptual framework of Digital Entrepreneurial Ecosystems (DEEs), defined as dynamic and interconnected systems of heterogeneous actors mobilizing digital technologies for value co-creation (Bejjani, Göcke, & Menter, 2023). The findings empirically demonstrate that a digital platform can transcend its primary operational function to assume an ecosystem catalyst role through three distinct yet complementary mechanisms: direct transfer of technical knowledge, establishment of structured collaborative partnerships, and generation of demonstration effects stimulating digital adoption.

These identified mechanisms find robust theoretical grounding in the Knowledge Spillover Theory of Entrepreneurship (KSTE), which posits that uncommercialized knowledge from established firms spills over to entrepreneurs who identify exploitable commercial opportunities therein (Audretsch, Belitski, Guerrero, & Siegel, 2024). Paradoxically, the Yassir case reveals that knowledge spillovers can originate from a digitally native startup that, despite its organizational youth, assumes the functional role of an established firm vis-à-vis emerging ventures possessing more limited technical capabilities. Digitalization thus operates as a mechanism for reducing the knowledge filter conceptualized by Acs et al. (2013), insofar as the provision of technical consulting services and training programs lowers barriers to accessing specialized expertise, generating what Audretsch and Fiedler (2024) characterize as bidirectional reverse knowledge spillovers enriching the entire ecosystem.

The empirical findings converge substantially with recent work by Jacobides et al. (2024), whose analyses demonstrate that platforms emerge as novel organizational forms capable of effectively managing externalities and addressing market failures. The digital infrastructure developed by Yassir, integrating GPS geolocation systems, AI-driven personalization modules, and data analytics platforms, generates positive externalities from which partner ventures can benefit without bearing the substantial costs of initial development. This observation corroborates the conclusions of Alzamel (2024) regarding DEEs in emerging markets, where pioneering platforms frequently assume quasi-public infrastructure functions compensating for the institutional voids characterizing these entrepreneurial environments.

The empirical identification of three distinct spillover channels enriches the theoretical literature on knowledge diffusion mechanisms in entrepreneurial ecosystems. The Yassir case precisely exemplifies the hybrid mode conceptualized by Audretsch et al. (2024), combining passive spillovers resulting from observation and imitation with active spillovers emerging from formal contractual arrangements for consulting and partnership. This observation diverges significantly, however, from the findings of longitudinal studies conducted in European entrepreneurial ecosystems, notably Fotopoulos et al. (2025) analysis of regional determinants of High-Growth Firms in the United Kingdom, which identifies a relatively marginal role for knowledge spillovers compared to human capital and structured professional services. This empirical divergence likely reflects fundamental contextual differences between markets: in mature economies endowed with robust institutional infrastructures and established professional networks, dependence on informal spillovers is mechanically reduced, whereas in contexts characterized by pronounced institutional voids (such as Algeria) spillovers from pioneering platforms acquire crucial importance in the absence of institutionalized alternatives.

Within the specific context of African digital entrepreneurship and the MENA region, the findings align with dynamics recently documented by empirical research on these emerging markets. Although the African entrepreneurial ecosystem generates substantial economic value, persistent systemic constraints hinder its optimal development: cross-border payment restrictions, insufficient digital connectivity infrastructures, and severely limited access to financing with North Africa capturing less than 5% of total funding allocated to African technology (Africa Renewal, 2024). In this institutionally constrained context, Yassir partially compensates for these voids by assuming functions normally devolved to public institutions or specialized intermediary organizations (incubators, accelerators, government support programs).

The case thus empirically illustrates an emerging market DEE presenting three distinctive characteristics: first, a centralized digital infrastructure around a dominant platform rather than a multi-platform ecosystem; second, predominantly informal and relational coordination mechanisms compensating for the absence of formally institutionalized governance; third, strong structural dependence on direct spillovers rather than institutionalized knowledge transfer channels. This organizational configuration differs substantially from DEEs observed in developed contexts, which typically present a multiplicity of competing and complementary platforms, institutionally anchored governance mechanisms

(structured venture capital, government programs, angel investor networks), and a diversity of knowledge transfer channels including academic institutions, applied research centers, and specialized professional training programs (Jacobides, Cennamo, & Gawer, 2024).

The analysis of causal mechanisms reveals a three-phase evolutionary sequence temporally distinct. First, a phase of intensive accumulation of internal digital capabilities through substantial technological investments. Second, a phase of spontaneous emergence of collaboration demands emanating from less-resourced ventures, operating according to a pull (attraction) logic rather than push (proactive diffusion). Third, a phase of progressive institutionalization of ecosystem roles through the formalization of consulting programs, training, and structured partnerships. This evolutionary sequence suggests that the ecosystem role of digital platforms emerges organically from interaction dynamics rather than resulting from ex ante strategic planning, an observation consistent with recent work on emergent governance of platform ecosystems (Kari, Bellin, Matzner, & Gersch, 2025).

The effectiveness of the identified spillover mechanisms appears mediated by three critical contextual factors. First, sectoral proximity between the source platform and recipient ventures, with knowledge diffusion proving more effective toward firms operating in adjacent rather than distant domains (Cicerone, Faggian, Montresor, & Rentocchini, 2023). Second, the pre-existing absorptive capacity of beneficiary ventures, conceptualized as their ability to recognize, assimilate, and apply external knowledge, which requires a minimal base of prior knowledge (Cohen & Levinthal, 1989). Third, social norms of reciprocity and interpersonal trust structures, factors particularly salient in emerging contexts characterized by weak institutionalization of coordination mechanisms (Clough, Fang, & Wu, 2024). These three mediators jointly delimit the conditions under which spillovers can effectively materialize and generate measurable impacts on recipient venture performance.

The study contributes to extending KSTE by demonstrating that spillovers also originate from digital startups rapidly accumulating transferable capabilities. It introduces the concept of platform ecosystem architects; commercial platforms assuming coordination and knowledge diffusion roles (Clough, Fang, & Wu, 2024). The findings also underscore the fundamental duality of platforms: value creation/capture via market mechanisms versus generation of positive externalities diffusing value beyond organizational boundaries (Jacobides, Cennamo, & Gawer, 2024).

## **Conclusion**

Digitization not only contributes to the establishment of startups but also enables them to become platforms for influencing and developing other projects. The experience of Yassir confirms that a startup can simultaneously function as both a recipient and a developer if it invests wisely in technology and builds a collaborative model that is open to its entrepreneurial environment. This dual role represents a fundamental characteristic of digitally-enabled ventures operating within emerging market ecosystems.

The study of Yassir's experience demonstrated that digitization was the decisive factor in enabling its rapid growth and expansion, while simultaneously allowing it to play indirect roles in supporting and developing other startup companies. These ecosystem contributions manifested through opening opportunities for digital collaboration and partnerships that extended beyond traditional transactional relationships. Yassir's digital infrastructure stimulated innovation in similar sectors by demonstrating viable technological solutions adapted to local market conditions. Furthermore, the company's success created a competitive environment that encourages other companies to adopt digital transformation, thereby accelerating ecosystem-wide modernization and raising operational standards across the sector.

Based on these findings, several recommendations emerge for practitioners and policymakers. Startups should be encouraged to adopt digitization not only as a tool for self-growth but also as a means of positively influencing the business environment through knowledge sharing and collaborative engagement. Strengthening a culture of collaboration among digital startups and documenting success stories can provide valuable learning resources for emerging ventures while reducing information asymmetries that often hinder ecosystem development. Supporting initiatives that encourage startups to share technical knowledge and experiences would amplify positive spillover effects and accelerate collective capability building within entrepreneurial communities.

Future research should extend this investigation by studying cases of other Arab startups that have played similar roles in developing their environment, enabling comparative analysis across different market contexts and regulatory frameworks. Analyzing the role of digital transformation in forming collaboration networks among startups would provide deeper insights into the mechanisms through which digitization catalyzes ecosystem coordination and mutual support. Such research would contribute to building a more comprehensive understanding of digital

entrepreneurship dynamics in emerging markets and inform more effective policy interventions.

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