

THE DYNAMIC INTEGRATION OF TECHNOLOGICAL INNOVATION AND ENTREPRENEURSHIP: A SYSTEMATIC LITERATURE REVIEW

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Abstract: This systematic literature review meticulously explores the complexities of technological innovation and entrepreneurship, with a particular focus on the strategies and management practices involved in new product development from an interdisciplinary standpoint. By conducting an extensive analysis of 323 key articles from 11 top-tier journals published between 2020 and 2023, the review delineates the current research trajectories within these fields, underscoring significant scholarly interest and development. The study particularly emphasizes the emergence of artificial intelligence-generated content technology since 2022 and critically assesses its influence on innovation processes and product development practices among both nascent entrepreneurs and well-established corporations. This emergent technology's role in shaping the competitive landscape and its potential to drive significant shifts in market dynamics are thoroughly examined.

Keywords: Technological innovation; Entrepreneurial transformation; Entrepreneurship; New product development; Innovation management; Systematic literature review.

1 INTRODUCTION

1.1 Research Background

Technological industries have rapidly advanced in the modern era. The significance of research on technological entrepreneurship and new product development is growing, especially in the context of innovation management for small to medium-sized enterprises (SMEs), emphasizing sustainable development processes. Emphasis has been placed on the role of homogeneity in work behavior focused on innovation, indicating its significant influence on employee conduct in innovative activities. This serves as empirical evidence reinforcing the domain of innovation management [1].

The intricate structure of the innovative entrepreneurial ecosystem encapsulates a web of relationships among diverse stakeholders such as academic institutions, universities, state-owned enterprises, incubation centres, and non-profit organizations. Significant differences have been discerned between university-incubated enterprises and innovative startups through rigorous scholarly examinations. Empirical research undertaken in Italy scrutinized the performance metrics of various types of enterprises within the innovation ecosystem, providing valuable insights into its evolution [2].

Wróbel et al. [3] focused intently on fostering creativity within entrepreneurial teams. They endeavoured to understand strategies that amplify creativity by cultivating the dynamics of the entire team. They proposed strategies and approaches aimed at guiding smaller groups to enhance creativity and, consequently refine innovation management practices.

The emergence of Artificial Intelligence Generated Content (AIGC) has exerted a profound influence on traditional industries in recent years, with its impact expected to persist through 2023. This technological innovation has opened new avenues for traditional sectors and fortified the innovative capacities of SMEs [4]. With the escalating allure of artificial intelligence (AI), an expanding cohort of entrepreneurial groups is directing their efforts toward this domain, thereby magnifying opportunities and optimizing resource allocation for SMEs. With the escalating allure of artificial intelligence (AI), an expanding cohort of entrepreneurial groups is directing their efforts toward this domain, thereby magnifying opportunities and optimizing resource allocation for SMEs. These progressive shifts are crucial for ensuring the sustainability of traditional sectors and facilitating the expansion of SMEs. By collaborating with these avant-garde teams, SMEs can foster innovation and secure enhanced technical assistance and collaborative ventures.

Finally, an array of comprehensive studies by Sordi et al. [5] elucidated the creative methodologies employed by entrepreneurs during the development phase of new products and services. Their research aimed to reveal the modifications and resulting impacts of creative methods employed by entrepreneurs across diverse stages, offering practical guidance and decision support for managing organizational innovation.

1.2 Research Motivation

By thoroughly immersing ourselves in these studies, a comprehensive understanding of the impact of technological entrepreneurial endeavors on innovative work behaviors, distinct performances among various enterprises within the

innovation ecosystem, effective strategies to foster creativity during team formation, and the inventive approaches employed by entrepreneurs in ideating and executing new products and services can be achieved. These scholarly articles provide invaluable research contexts, establishing a robust theoretical and empirical basis for our investigation. Considering the aforementioned research background, this study delves into the realm of innovation management and strategy concerning technological entrepreneurship and the development of new products. Employing an interdisciplinary perspective and amalgamating findings from a range of scholarly articles alongside insights from esteemed academics, our goal is to offer a comprehensive understanding of the challenges encountered in innovation management during technology entrepreneurship. Moreover, we aim to examine the impact of innovation strategies on the development and market introduction of new products. This study aims to provide enlightening perspectives on innovation management and strategies pertinent to technology entrepreneurs, business managers, and academia, thereby contributing to the sustainable advancement of the fields of technology entrepreneurship and new product development.

1.3 Research Gap

In 2022, the introduction of AIGC technology triggered a notable upswing in technological innovation. Tech entrepreneurs and major global corporations swiftly recognized the value and potential of this technology, actively engaging in AIGC-related businesses and new product development. Illustrative instances encompass the OpenAI team, led by its distinguished founder, responsible for the development of ChatGPT4.0, and the serial entrepreneur associated with the Midjourney product. This trend signifies the emergence of a new research focal point that concurrently presents challenges in technological and business model innovations for entrepreneurs. AIGC technology represents a significant advancement over previous AI technologies. This study stands as one of the pioneering efforts to systematically review the literature, revealing the latest research trends in the interconnected domains of technological innovation and entrepreneurship.

1.4 Purpose of the Study

The objective of this study is to conduct a literature review using inductive and observational methods from qualitative research approaches. By comparing recent noteworthy literature from the preceding three years—which represent an era of continuous technological innovation—we can identify innovative strategies that startups and SMEs should adopt, instead of persistently relying on existing products to maintain market share.

To this end, we review and analyse the relevant literature to answer the following research questions:

- a) Where do the opportunities for technology entrepreneurship and innovation management lie?
- b) What is the relationship between technological innovation and entrepreneurship and new product development in 2020-2023?

2 LITERATURE REVIEW

2.1 Relationship Between Entrepreneurship and New Product Development

2.1.1 Impact of new product development on entrepreneurship

Entrepreneurial endeavors exhibit diversification across various formats. The pivotal role of new product development in entrepreneurial pursuits significantly influences entrepreneurs and startup ventures. New product development encompasses diverse formats, including the creation of online applications catering to daily telecommuting or online entertainment, offline iterations, research and development (R&D), and enhancements of physical products like furniture, home appliances, and electronic devices to fulfill public demands.

Proactive new product development provides entrepreneurs with numerous advantages. Cenamor and Frishammar [6] highlighted the importance of platform openness regarding open platform ecosystems such as the Google App Store and Apple Store. They also emphasize that entrepreneurs can secure innovation and competitive advantages by engaging in platform ecosystems and collaborating with other participants to develop complementary products. This underscores that entrepreneurs should emphasize cooperation with third-party participants within relevant platform ecosystems during new product development and adopt different innovation strategies at different stages.

Many fledgling entrepreneurs concentrate their entrepreneurial activities on emerging technology industries due to the perceived substantial business opportunities in the future. Additionally, a robust association is evident between high-tech entrepreneurship and innovation effectiveness. Previous studies identified a positive correlation between high-tech entrepreneurial activities and innovation effectiveness, with absorptive capacity serving as a moderator [7]. Consequently, entrepreneurs are advised to augment the absorption of important external knowledge to enhance the innovation effectiveness of their subsequent entrepreneurial activities.

As entrepreneurs typically start with small- to medium-sized businesses, previous studies on entrepreneurship have mostly focused on SMEs. In this context, entrepreneurial orientation and business model innovation play a significant mediating role in the performance of new product development. Entrepreneurial orientation inspires innovative thinking and creativity, whereas business model innovation translates innovations into business success [8]. Therefore, entrepreneurs must attach significant importance to innovative thinking and skills in incorporating business models during the process of new product development.

An escalating number of entrepreneurs are now of a younger demographic, comprising many who initiate new ventures during their collegiate or high school years. These youthful entrepreneurs exhibit a proclivity for greater daring and innovation, leveraging their business acumen to discern business prospects and market demands [9]. Consequently, entrepreneurs should harness the characteristics associated with youthfulness in new product development, adeptly discerning market and consumer needs.

Entrepreneurs ought to recognize the substantial impact of new product development on entrepreneurship. Thus, active engagement in new product development is vital for accruing innovative and competitive advantages. This involves collaborating with platform participants, enhancing external knowledge absorption, fostering innovative thinking, innovating business models, and capitalizing on their youthful vigor and business foresight.

Within entrepreneurship, leaders must possess a firm grasp of innovation management. The failure rate of ventures surges when entrepreneurs detach from the external environment and eschew innovative pursuits. According to Amaya et al. [10], innovation management encompasses processes, resource allocation, and collaborative teamwork essential for developing new products within an organization. Hence, formulating robust innovation strategies becomes pivotal. Entrepreneurs must engage with the external milieu to access market opportunities and craft pertinent innovation strategies, thereby preserving their competitive edge.

In new product development, team characteristics and dynamics also play a major role. Researchers have also addressed the relationship between entrepreneurial imagination and startup teams. Entrepreneurs' imagination is closely related to the conceptualisation process of startup teams and can inspire innovative thinking and the generation of ideas [11]. This study highlights the importance of entrepreneurial creativity and imagination in developing new products.

Presutti et al. [12] conducted an analysis on the mediating effects within the relationship evolution of social capital and product innovation, utilizing a Born-Global firm as a case study. They underscored the paramount importance of knowledge acquisition. The findings indicate that startups can enhance innovation in both new and existing products through the establishment of robust social capital networks and active involvement in knowledge acquisition processes. In summary, this study highlights the pivotal roles played by boundary spanning, team size, and functional diversity in the context of new product development teams. These factors, deemed essential for reinforcing team confidence [13], collectively contribute to fostering knowledge sharing, collaboration, and innovation. This, in turn, augments the confidence and performance levels of teams involved in the development of new products.

The process of new product development is intricately connected to entrepreneurship. As a result, entrepreneurs are urged to prioritize innovation management and strategy development. They should actively engage with the external environment to consistently assimilate innovative knowledge. Furthermore, entrepreneurs should focus on constructing robust social capital networks, leveraging their creativity and imagination to establish appropriately sized, boundary-spanning teams imbued with functional diversity. These measures are integral to enhancing performance and confidence in the realm of new product development.

2.2 Function of Innovation Management and Technology Management in Entrepreneurship and New Product Development

2.2.1 Open innovation and business model innovation

Open innovation is an innovation management approach that emphasizes collaboration and knowledge sharing between an organization and its external environment. However, excessive open innovation also poses certain risks. Entrepreneurs' achievements and knowledge can easily be plagiarized or imitated by their competitors. In the process of entrepreneurship and new product development, open innovation has a significant impact on firms' business model innovation.

Barrett et al. [14] conducted a focused investigation into the influence of entrepreneurial founders on open innovation practices within high-tech SMEs. They discerned that entrepreneurial founders play a pivotal role in guiding and shaping decisions throughout the open innovation process. These founders are compelled to disseminate knowledge and resources by actively networking with external partners, thus leading the organization in embracing open innovation practices. This underscores the crucial role of entrepreneurial founders in facilitating the innovation of business models. In an open innovation milieu, coherence and interconnectivity among diverse product categories can augment the viability of business model innovation [15]. This implies that, through collaborative exchanges of open innovation among entrepreneurs, firms have the opportunity to glean inspiration and insights from disparate product categories, thereby propelling business model innovation.

Aagaard [16] systematically explored avenues for cultivating innovative business models through open innovation competitions and engagement with student teams. The study unveiled that, through collaboration with external participants and student teams, organizations can harvest novel business model innovations stemming from varied perspectives and ideas. Open innovation competitions serve as an expansive platform, enabling firms to attract and amalgamate innovative thinking and ideas from diverse communities, thereby steering innovation and the evolution of business models.

In summary, open innovation significantly contributes to the innovation of business models. The leadership and decision-making skills of entrepreneurial founders emerge as pivotal factors in steering open innovation within an organization. Simultaneously, collaborative exchanges in an open innovation environment empower firms to glean inspiration and innovative insights spanning various categories of recently developed products, thereby expediting

innovation in business models. Additionally, open innovation competitions and student team engagements establish an open platform, enabling firms to cultivate the development of innovative business models.

2.2.2 Entrepreneur cognition, leadership, and organisational structure

Entrepreneurs' cognition, leadership, and the organizational structure of innovative and entrepreneurial activities are equally important factors that influence the course of entrepreneurship and new product development. In the following section, the links between these factors are examined by analysing the relevant literature.

The knowledge spillover theory of entrepreneurship suggests that entrepreneurs foster economic growth by commercialising new knowledge created by existing organizations, such as firms, research laboratories, and universities [17]. In particular, advanced technologies developed through intense R&D activities express advanced knowledge and are considered core resources for strengthening innovation. Consequently, researchers have focused on the effects of entrepreneurial cognition and leadership on knowledge spillover. They have found that the board of directors plays a key role in startups by providing knowledge and resources to facilitate innovation and knowledge spillover [18]. Entrepreneurs' cognitive characteristics and leadership skills are instrumental in board decisions and have significant implications for driving innovation and knowledge transfer.

Bunduchi et al. [19] examined the effect of the entrepreneur cognition framework in digital product innovation. The results revealed that the cognitive framework of entrepreneurs plays a key role in decision-making and actions during the innovation process of digital products. Entrepreneurs' cognitive frameworks comprise an awareness of technology, markets, and business models instrumental for startups to innovate in the digital environment.

Previous studies have emphasised that the consistency of entrepreneurial and alliance orientations have synergistic effects on new product development. Entrepreneurial orientation emphasizes innovation and risk-taking, whereas alliance orientation values collaboration and resource integration. The synergy between entrepreneurial and alliance orientations can contribute significantly to the success of new product development [10].

Moreover, several scholars have investigated the origins of capabilities and assessed the implications of resource allocation strategies and capability development for startup performance. The research findings underscore that the strategies for resource allocation and the development of capabilities exert a notable influence on a startup's performance trajectory. Specifically, adept resource allocation and robust capability development bolster a new firm's competitiveness and capacity for innovation, thereby fostering entrepreneurial endeavors and facilitating advancements in product development [20].

Finally, Agostini et al. [21] investigated the challenges and opportunities for management arising from the digitalisation of the innovation process. They found that the widespread use of digital technologies has transformed management needs and the manner in which innovation processes are conducted. Entrepreneurial managers must address the challenges posed by digitalisation and take advantage of the opportunities offered by digital technologies to contribute to the success of innovation activities and new product development.

In summary, the cognitive attributes, leadership styles, and organizational structures of entrepreneurs assume pivotal roles in both entrepreneurial activities and the development of new products. The cognitive characteristics and leadership skills of entrepreneurs wield influence over knowledge spillover and decision-making behaviors. Simultaneously, the configuration of organizational structures and the strategies employed for resource allocation impact the capacity for innovation and overall performance. Consequently, there is a compelling need for researchers to delve deeper into how entrepreneurs' cognition, leadership, and organizational structures can be optimized, thereby fostering the success of entrepreneurship and the advancement of new product development.

2.2.3 Innovation performance assessment and KPIs

In innovation management and new product development, it is critical to assess innovation performance and identify key performance indicators (KPIs). This section addresses the significance of innovation performance assessments and the related KPIs.

Innovation and entrepreneurship are not identical concepts. Innovation refers to the introduction of a new idea, method, or product into an organization, whereas entrepreneurship emphasizes putting these innovations into practice and generating business value. When assessing innovation performance, firms must clarify the difference between innovation and entrepreneurship and establish corresponding assessment indicators [22].

The assessment of innovation performance is essential during the entrepreneurial phase. Innovation is the process of transforming passion into practice, where the key is translating innovative ideas into actual business practices and achieving business targets. Assessing innovation performance requires a focus on the implementation of innovation projects, market performance, and creation of business value [23].

Nappi and Kelly [24] conducted a comprehensive review of Key Performance Indicators (KPIs) for evaluating innovation process performance. The scholars highlighted that pivotal indicators gauging the effectiveness of the innovation process encompass inputs, outputs, speed, quality, and impact. These metrics empower organizations to evaluate their innovation performance thoroughly, discern areas requiring enhancement, and devise judicious management strategies.

In summary, innovation performance assessment and the identification of KPIs are critically important for innovation management and new product development. Firms should clarify the differences between innovation and entrepreneurship, monitor the implementation of innovation projects and business practices, and assess them using appropriate KPIs. This helps the organization identify the effectiveness and value of innovation activities and make management decisions accordingly.

2.2.4 Employee-driven innovation in entrepreneurial teams

A burgeoning body of research within innovation management focuses on the strategies adopted by entrepreneurial founders in conjunction with the role and impact of employees in the innovation trajectory. This section expounds upon the concept of employee-driven innovation (EDI), its associated measurement tools, and preliminary validation outcomes.

Echebiri et al. [25] endeavored to clarify the EDI construct and formulate an assessment tool for its quantification. They adopted an integrative methodology by assimilating existing measurement tools pertaining to EDI-related concepts into their study. Employing exploratory and confirmatory factor analysis techniques, the researchers identified three dimensions of EDI: emergence and ideation exploration, idea generation, and idea development coupled with implementation. The instrument exhibited satisfactory reliability and validity.

The current study provides an essential tool for understanding EDI, which implies that employees are actively involved in the innovation process and offer new perspectives and ideas to facilitate development and implementation. The use of EDI as a measurement tool allows organizations to assess the level of EDI and take appropriate managerial actions to facilitate innovation.

2.3 Technological Entrepreneurship and Digitalisation

2.3.1 AI and big data in innovation research

The use of AI and big data in innovation research has received increasing attention from business organisations and the academic community. Many scholars have explored the impact of AI and big data on the innovation process from the perspectives of a systematic literature review and theoretical construction and proposed a vision for future research.

A recent systematic literature review conducted by Mariani et al. [26] analysed the intersection of AI and innovation research. By conducting a bibliometric analysis using 1,448 articles retrieved from literature databases, they revealed the main topics of AI and innovation research and their evolution over time. Through keyword co-occurrence and literature coupling techniques, they provided insights into AI and innovation research. Based on their review, they proposed an explanatory framework that elucidates the drivers and outcomes of AI adoption in innovation. They found that firms' adoption of AI in innovation is influenced by economic, technological, and social factors and that AI adoption significantly impacts firms' outcomes in terms of economic, competitive, and organisational innovation.

Scholars also closely follow innovation and entrepreneurship activities in China. Among the companies listed on the Science and Technology Innovation Board in China, the strategic choices of technical founders in the digital context affect their innovation performance. Scholars have scrutinized the annual reports of 124 corporations listed on China's Science and Technology Innovation Board. Using machine learning techniques, they quantified the digital transformation of these firms and established a moderated mediation model to probe the correlation between technical founders and innovation performance. The findings suggest that corporations with technical founders are more inclined to embrace digital transformation and demonstrate superior innovation performance. Regarding heterogeneity, the results revealed that corporations with technical founders outperform those with commercial or academic founders in digital transformation. Simultaneously, venture capital or private equity support positively moderates the relationship between firms' digital transformation and innovation performance [27]. These findings reveal the micro-level mechanisms of technical founders on firm innovation performance, which have practical implications for promoting firms' digital transformation and enhancing their technological innovation.

Sun and Liu [28] examined the relationship between business model design, big data analysis capability, and new product development performance. Although business models have become an essential area of research in management studies, confusion and limitations remain in the existing literature regarding how business models are designed to drive new product development. Furthermore, few empirical studies have examined the moderating effects of various aspects of a firm's learning capabilities on this relationship. The current study demonstrates the impact of investigating the novel and efficient design of business models on the performance of new product development and the moderating role of the analytic capabilities of big data.

The above literature reveals the potential effects of AI and big data on innovation research. Through systematic review and theoretical construction, researchers have revealed the significant effects of AI on the drivers and outcomes of the innovation process. Notably, the strategic choices of technical founders and the digital transformations of firms play crucial roles in driving innovation performances.

2.4 Challenges and Opportunities in the Digital Transformation and Innovation Process

Digital transformation faces several challenges and opportunities in its innovation process. In the existing research, scholars have discussed this issue in depth and provided many valuable insights.

Digital innovation is complex. Agostini et al. [21] addressed challenges and opportunities from a management perspective. They pointed out that the rapid development of digital technologies has significantly improved many business processes and played an important role in the field of innovation. To understand this field better, researchers have divided it into three key topics: innovation inputs, processes, and outcomes.

Silva et al. [29] examined the application of the lean startup methodology to opportunity development. Lean startup refers to an entrepreneurial methodology designed to help entrepreneurs build and manage startups more effectively. It emphasizes rapid iteration, continuous learning, and flexible adaptation to validate the entrepreneurial hypotheses and facilitate product development. Silva et al. [29] paid special attention to startups in different technological communities

in Brazil. They investigated nine Brazilian startups in biotechnology, engineering, and software using qualitative data collection method and analysis. The results showed that the startups adopted the tools and practices of the lean startup methodology to conduct opportunity development activities such as business model validation. They also found that these startups responded to the limitations of contextual factors through the systematic adoption of the lean startup methodology by integrating them with other innovative strategies and practices in the early stages.

Upadhyay et al. [30] explored the impact of digital entrepreneurship and entrepreneurial orientation on family firms' intention to adopt AI. They used structural equation modelling and validated the model based on data from 631 respondents. The results showed that culture, flexible design, and entrepreneurial and technology orientations had significant effects on the intention to adopt AI and that firm creativity played a partially mediating role in the process. Their study has important implications for entrepreneurship, family business research, and theoretical developments in AI.

Collectively, the above studies show that digital transformation poses significant challenges and opportunities in the innovation process. Researchers have emphasised the value of digital technology in innovation and explored the application of the lean startup methodology and AI in different contexts. These studies provide valuable insights for researchers on how to address challenges and exploit opportunities for digital transformation.

2.5 Innovation Ecosystem and Cooperation Network

2.5.1 Collaborative innovation between academic and industrial communities

University-industry collaboration has served as a foundational pillar for supporting entrepreneurial endeavors. However, the intricacy and significance of collaborative innovation between academic and industrial communities are profound.

Gimenez-Fernandez et al. [31] compared the innovation performance of emerging innovative startups with that of traditional small firms. They found that emerging firms have barriers related to their novelty and size, while traditional small firms perform better in innovation because of their experience and accumulated resources. This suggests that, in collaborative innovation, academic and industrial communities can learn from the experiences of traditional small firms and provide support and guidance to emerging innovative startups.

Gimenez-Fernandez et al. [31] conducted a comparative analysis of the innovation performance between emerging innovative startups and traditional small firms. Their findings indicate that emerging firms encounter barriers associated with their novelty and size, whereas traditional small firms excel in innovation due to their accrued experience and available resources. Consequently, in the realm of collaborative innovation, there exists an opportunity for academic and industrial communities to glean insights from the experiences of traditional small firms and extend support and guidance to nascent innovative startups.

Auerswald and Dani [32] delved into the intricate relationship between entrepreneurial opportunities and specialization within economic ecosystems. Their research underscores that entrepreneurs play a pivotal role in fostering collaborative innovations by identifying and capitalizing on opportunities within a given economic ecosystem, coupled with a strategic specialization in related domains. This underscores the critical significance of fostering interaction between academic and industrial communities to not only bolster and nurture entrepreneurial opportunities but also to facilitate specialization in interconnected fields.

Additionally, there is a strong link between innovation management and organisational behaviour. Research has emphasised the importance of human factors in innovation management and proposed an approach that combines innovation management and organisational behaviour [33]. This implies that academic and industrial communities can draw on the theory and practice of organisational behaviour and apply them to innovation management to facilitate collaborative innovation.

Giasolli et al. [34] identified management technology and innovation and technology entrepreneurship centres of excellence that guide and support innovation. They highlighted the importance of collaboration between academic and industrial communities to jointly drive the development of management technologies and innovation. Furthermore, such collaboration can foster centres of excellence to contribute to the growth of innovation ecosystems.

Subsequently, researchers have revealed the impact of information availability on technology entrepreneurship through long-term analyses. The findings show how information availability affects the process and performance of technology entrepreneurship [35]. This warns academic and industrial communities that they should prioritise information access and sharing to improve innovation effectiveness and collaborative innovation outcomes.

Lu and Dimov [36] explored the relationship between entrepreneurship and intra-firm growth using a system dynamics model. Their study revealed the effect of entrepreneurship on the intra-firm growth process and highlighted that academic and industrial communities can work together to promote an organisational environment with an entrepreneurial culture and growth orientation.

Fan et al. [37] directed their attention towards habitual entrepreneurial behavior within digital platform ecosystems. They constructed a time-centric learning model to elucidate the learning processes of entrepreneurs, drawing insights from their experiences in past software projects. The study delved into the nexus between these experiences and the consequential impact of habitual entrepreneurial behaviors on collaborative innovation. Special emphasis was placed on fostering collaboration between academic and industrial communities within the digital platform ecosystem, with a view to endorsing innovative practices and cultivating habitual entrepreneurial behaviors.

In the innovation and entrepreneurship processes, accelerating innovation through minimal and adaptive coordination without compromising the innovation process poses a significant challenge. Scholars have examined hackathons, and

their findings reveal how this coordination approach can play a positive role in the innovation process. Thus, academic and industrial communities should value collaborative approaches and strategies to facilitate the rapid development of innovation [38].

The preceding literature highlights the pivotal roles played by academic and industrial communities in collaborative innovation. Academic research provides both theoretical guidance and practical experience to the industry. Furthermore, it facilitates synergy and innovation in innovation management, the identification of entrepreneurial opportunities and specialisation, the application of organisational behaviour, access to technological information, habitual entrepreneurial behaviour in the digital platform ecosystem, and optimisation of the coordination approach. Industrial requirements and practices have contributed to the advancement of research and theories in the academic community. Consequently, collaborative innovation between academic and industrial communities mutually reinforces, laying a solid foundation for the prosperous and sustainable development of innovation ecosystems.

2.5.2 Entrepreneurial teams, alliances, and resource allocation

In new product development, consistent positioning of entrepreneurial teams and alliances is critical to success (Rivas et al., 2020). Rivas et al. (2020) found that differences between the orientation of the entrepreneurial teams and that of the alliances may lead to conflicts in resource allocation and breakdowns in partnerships. Therefore, firms should strive to achieve alignment between the entrepreneurial team and the alliance to contribute to the success of new product development. Effective resource-allocation strategies are essential for the capability development and performance of new ventures [20]. Different types of resourcing strategies, such as diversified and focused resource allocation, may affect firm performance to varying degrees. Consequently, startups should carefully select and manage resources to support the development of capabilities and achieve favourable performance.

Simultaneously, entrepreneurship can boost the development of local areas in various ways [39]. One such way is to achieve rapid growth through rapid expansion and sprawling, and another is to achieve sustainable growth through steady development and deep cultivation. This depends on the specific local contexts and resource conditions. Entrepreneurship can create jobs, promote economic growth, and achieve sustainable development in local communities. The 'Innovation Systems Roadmap' constitutes a foundational innovation concept, providing a crucial framework for organizations to incorporate future-oriented thinking into their decision-making processes. This roadmap empowers organizations to identify and assess potential future scenarios, comprehend the impact of these scenarios on their strategic goals, and devise pertinent strategies and actions to leverage emerging opportunities. It has been argued that traditional approaches to strategic decision-making tend to concentrate on the past and present, neglecting the importance of anticipating and preparing for future change [40].

Enhancing the confidence of new product development teams is crucial [13]. Team boundary spanning, size, and functional diversity significantly contribute to enhancing team confidence. Team boundary spanning facilitates information flow and knowledge sharing; moderate team size provides resources and support, while functional diversity fosters innovation and diverse perspectives.

Innovation ecosystems and collaborative networks address crucial aspects: maintaining consistency in the positioning of entrepreneurial teams and alliances, implementing effective resource allocation strategies, ensuring local sustainability, and bolstering confidence within new product development teams. These interrelated factors are crucial for firms' innovation and development.

3 METHODOLOGY

3.1 Research Process

Employing a qualitative research approach, this study explores the management and strategic aspects of innovation within the context of technological entrepreneurship and new product development. Initially, the Scimago journal ranking database was used to retrieve relevant journals, focusing on the primary categories of business, management, and accounting and the subcategory of technological innovation and management without any geographical limitations. This ensured comprehensive coverage of the pertinent global literature.

Subsequently, we identified authoritative and professional journals from the Social Sciences Citation Index zones one and two, which align closely with the research fields of innovation entrepreneurship management and new product development. During this selection process, we meticulously assessed each journal's metrics, including the impact factor, CiteScore, Source-Normalized Impact per Paper, Field-Weighted Citation Impact, and h-index, to ensure that the literature review was grounded in the most authoritative and professional sources.

Finally, eleven journals were chosen for the systematic literature review. This approach guaranteed a thorough examination of each piece of literature within the selected journals, facilitating the extraction of key insights related to technological entrepreneurship, new product development, innovation management, and strategies. The focus was on the theoretical frameworks, research methodologies, primary findings, and conclusions within these sources, facilitating a comprehensive understanding of the respective research fields.

3.2 Literature Research Collection

In this literature review, a comprehensive literature collection strategy focusing on 11 authoritative and professional journals was employed. The focus was on articles published between 2020 and 2023, facilitating comprehensive insight into the latest research trends and future trajectories in the realm of innovation entrepreneurship management

and new product development. The searches in these 11 journals were guided by the following keywords: 'entrepreneurship and new product development', 'innovation management', and 'technology management'. These keywords were selected to maximize the relevance of the search results to the study's research topic.

Literature collection and screening occurred in two stages. Initially, 324 studies pertinent to the research topic were identified (Figure 1). This broadened the scope of the research to the greatest extent possible, facilitating a comprehensive understanding of the current research landscape and developmental trends in this field. In the second stage, the selection was refined to 40 pieces of literature with the greatest relevance and significance to the research topic. This step was intended to deepen the research, allowing for an in-depth analysis and discussion of the selected literature. We undertook a systematic review of these sources, focusing on aspects including, but not limited to, the theoretical framework, research methods, main findings, and conclusions.

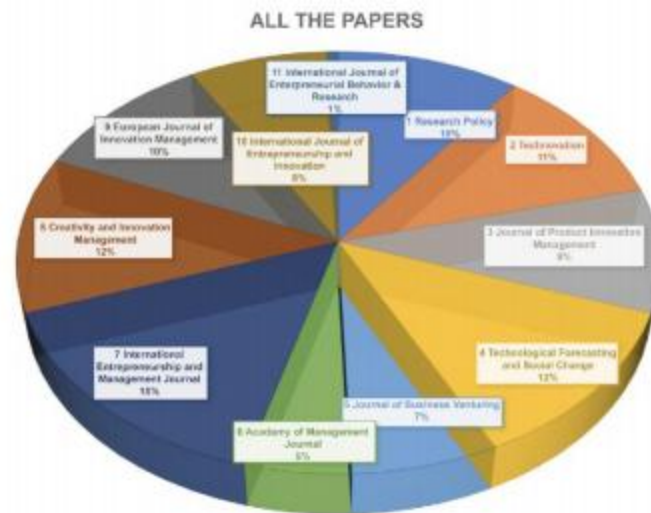


Figure 1 Eleven Authoritative Journals were Searched for Studies Pertinent to the Research Topic (Total: 324 Papers)

4 DISCUSSION AND CONCLUSION

This study undertook an in-depth exploration and rigorous analysis of the findings and results of an extensive collection of 40 studies, each from diverse sub-fields of innovation and entrepreneurship.

Discussions on technology entrepreneurship and new product development uncovered a compelling argument that academia and industry have a decisive impact on the process of collaborative innovation. Academic research contributes to theoretical frameworks and tangible experiences by acting as a catalyst in advancing innovation management, unearthing entrepreneurial opportunities, specialisation, and harnessing organisational behaviours. This nexus further facilitates the procurement of technological information and optimizes entrepreneurial activities and modes of coordination within the digital platform ecosystem, fostering an environment conducive to collaboration and innovation. Consequently, the industry's inherent requirements and applied practices continually propel the evolution of academic research and its underlying theories. Academia and industry exist in a state of mutual enhancement and interdependence, forming a robust foundation that underpins the dynamic and sustainable proliferation of the innovation ecosystem.

In the ambit of new product development, the alignment between the entrepreneurial team's orientation and that of the alliance proves to be a decisive factor in dictating success or failure. This discourse further posits that heightened self-assuredness stemming from entrepreneurial success profoundly affects the trajectory and outcomes of technological entrepreneurship. This underscores the paramount importance of entrepreneurs focusing on the procurement and dissemination of information, which, in turn, augments the efficiency of innovation and the fruition of collaborative innovation.

Meticulous examination of the relevant literature highlighted the pivotal role of entrepreneurship in the internal growth process of enterprises. This accentuates the potential for academia and industry to jointly foster an entrepreneurial culture and an organisational environment oriented towards growth. The significance of habitual entrepreneurial behaviour within the digital platform ecosystem, along with its contribution to the process of collaborative innovation, warrants attention. This highlights the imperative for academia and industry to engage in collaborative efforts to scrutinise the digital platform ecosystem, bolstering innovation and habitual entrepreneurial behaviour.

Amid the advancing tides of globalisation and technological progress, innovation and entrepreneurship emerge as pivotal contributors to economic growth. In this context, the nexus between the academic and industry sectors has drawn considerable attention. This study embarked on an extensive literature review, combined with analytical and empirical examinations, to delineate the synergies and roles of academia and industry in bolstering innovation and entrepreneurship trajectories.

Our research emphasizes the pivotal roles of academia and industry within the innovation and entrepreneurship landscape. Particularly in the context of new product development, academia provides theoretical guidance, technological research, and talent development, while industry offers market insights, avenues for application, and financial support. This reciprocal relationship not only facilitates the transition from conceptualizing technology to implementing practical applications but also expedites the introduction and market acceptance of new products. Furthermore, we emphasize the importance of university incubators. In today's highly competitive environment, reliance solely on academic research is inadequate. It is essential for university incubators to establish collaborations with leading industry enterprises, thereby aiding in the realization and integration of technological innovations into the market. Such an approach not only broadens the practical scope for scholars and professionals but also strengthens the alignment of educational institutions and incubators with evolving market dynamics, mitigating potential obsolescence. In conclusion, the synergistic interaction between academia and industry significantly contributes to the perpetuation of socio-economic progress. Their collaborative efforts can enhance the effectiveness of innovations while establishing a resilient groundwork for both innovation and entrepreneurial endeavors.

5 LIMITATIONS AND FUTURE DIRECTIONS

This study has specific limitations, notably the lack of geographical constraints in the search for journals and literature, which might have impacted the comprehensiveness and depth of the research findings. Additionally, this study did not analyze the distinct psychological states of first-time and serial entrepreneurs, an area warranting further investigation. Moreover, entrepreneurial risk assessment, another important research avenue, was not extensively examined in this study. Therefore, future research should comprehensively address these aspects to mitigate the limitations of this study.

COMPETING INTERESTS

The authors have no relevant financial or non-financial interests to disclose.

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