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Empowering Micro-Entrepreneurs through Digital Services: A Bibliometric Review of Technology Tools and Future Research Agendas

*Nur Atiqah Rochin Demong[1], Muhammad Iskandar Hamzah[1], Norfazlina Ghazali[1], Masrur Mohd Khir[2]
[1]Department of Entrepreneurship and Marketing Studies, Faculty of Business and Management, Universiti Teknologi MARA, Puncak Alam, Selangor, Malaysia
[2]Department of International Business and Management Studies, Faculty of Business and Management, Universiti Teknologi MARA, Puncak Alam, Selangor, Malaysia
Email: *rochin@uitm.edu.my, iskandarh@uitm.edu.my, norfazlina484@uitm.edu.my, masrur@uitm.edu.my
Corresponding Author: Dr Nur Atiqah Rochin Demong

Abstract: In today's fast-paced digital economy, micro-entrepreneurs increasingly rely on digital tools to keep their businesses running and growing. Despite this urgent digital transition, a comprehensive understanding of how academic research addresses this phenomenon remains fragmented. This paper maps the current literature using a bibliometric analysis of Scopus data to better understand how researchers are studying this trend. We break down what the academic community currently focuses on and what it frequently misses by applying co-citation analysis, keyword co-occurrence, and network mapping. Our results show a significant increase in research on digital tools, mobile applications, and cloud-based services for micro-entrepreneurs. However, this research is geographically skewed toward developing economies. The top three countries with high citations are the UK, India and the United States, while the highest number of publications is dominated by India, South Africa and the United States, respectively. Despite the growing body of work, significant gaps remain. We still know very little about the long-term impact of technology on a micro-enterprise's survival and do not even understand how local ecosystems drive technology adoption in the first place. This study provides a direct roadmap for scholars, policymakers, and industry practitioners looking to build better support systems for microentrepreneurs globally by identifying these blind spots.

Keywords: *Micro entrepreneurs, business technology tools, digital services, sustainability, bibliometric analysis*

1. Introduction

Digital tools are fundamentally changing how micro-entrepreneurs operate today (Kumar et al., 2026). Because technology evolves so quickly, software built to improve daily productivity is now cheaper and easier to access than ever before (Javaid et al., 2024; Karulkar et al., 2025). We need to track these usage patterns carefully. Understanding exactly which tools business owners choose helps explain how they survive and compete against much larger companies. Currently, micro entrepreneurs rely heavily on these digital services just to manage their basic operations (Corvello et al., 2022; Kolade et al., 2026). Recent data shows a massive jump in the adoption of cloud-based solutions, social media platforms, and mobile applications tailored to small-scale operations (Al Hadwer et al., 2021). These applications handle a bit of everything. Diverse business technology tools and services facilitate everything from customer relationship management (CRM) and inventory management to marketing and sales processes (Naim, 2022). The rise of Software as a Service (SaaS) platforms has particularly enabled micro entrepreneurs to access sophisticated tools without paying massive upfront costs (Mero et al., 2022).

Small business owners no longer use social media just to run ads. They rely on it to talk to buyers and build a recognizable brand identity (Jayasuriya et al., 2026). Research shows that platforms such as Instagram, Facebook and TikTok are pivotal in promoting products, creating community and driving sales (Dzreke & Dzreke, 2025). Micro entrepreneurs often use different social media platforms to tell their stories, showcase their products, and connect with their target audiences, either customers or consumers. This trend underscores the importance of digital presence as a key driver of business growth for micro entrepreneurs. Moreover, the shift toward of e-commerce has fundamentally changed how micro entrepreneurs operate. Studies highlight an increasing trend in the integration of e-commerce solutions with the growing number of online shoppers (Ingriana, 2025). At the same time, the shift toward online shopping forces micro-entrepreneurs to rethink how they sell. Setting up a digital shop used to be technically difficult and expensive. Digital tools and services such as Shopify, WooCommerce, and various payment gateways are enabling micro-entrepreneurs to establish online storefronts with relative ease (Peštek et al., 2026). This transition not only expands their market reach but also allows for 24/7 sales capability, providing a significant advantage in the existing trend of a consumer-driven economy.

Researchers are also noticing a major shift toward data analytics. Micro-entrepreneur owners finally see why tracking data matters. Instead of guessing, they use simple dashboards to monitor customer habits, spot sales peaks, and cut operational waste (Ibeh et al., 2024). Importantly, they do not need a computer science background to do this. Modern platforms are intuitive enough to handle the complex calculations automatically. At the same time, smartphones have completely rewired daily operations. Owners can now run their businesses through mobile apps. They process payments, check inventory, and text suppliers directly from their phones (Schilling & Seuring, 2023). This mobility lets them manage problems on the fly and make fast decisions, no matter where they are.

However, moving everything online introduces real risks. As these digital habits grow, cybersecurity has suddenly become a massive priority (Mhlongo et al., 2023). Fear of hacks and data leaks pushes micro-entrepreneurs to pay for secure payment gateways, data encryption, and basic malware protection. Knowing how to stay safe online is no longer just an Information Technology issue; it is a basic business survival skill that requires immediate education and awareness (Akter et al., 2025). Technology alone is not enough to guarantee success. Micro-entrepreneurs need funding, training, and mentors to actually adopt and use these tools effectively (Marinelli et al., 2023). Governments and non-government organizations (NGOs) are increasingly stepping in to provide this specific, targeted support. Business owners require hands-on exposure to different types of software. They get this through local workshops, online classes, and direct financial grants that help them bypass steep setup costs and use new systems confidently.

Current academic research clearly reflects this massive shift toward digital operations (Zahra et al., 2023). When these very small businesses integrate new tech, their capacity to grow and innovate increases dramatically. Ultimately, this paper outlines exactly how micro-entrepreneurs apply software to solve daily problems, speed up their work, and keep their doors open over the long term. Moving forward, both researchers and policymakers must keep tracking these changes. Continuous, structured support is the only way to ensure these business owners secure the skills they need to compete in a heavily digitized economy.

While academics agree that digital tools matter, we still lack a clear picture of how research on this topic has actually developed over time. Past papers usually look at just one specific app or a single local region. This bibliometric study fixes that problem. By looking at two decades of global data from 2004 to 2024, we map out exactly how this entire academic conversation was built. This paper is organized as follows. Section 2 discusses the trends and patterns of business technology tools and services among micro entrepreneurs. Section 3 presents and discusses the materials and methods used in highlighting the research trends of business technology tools and services among micro entrepreneurs. Section 4 discusses the key findings of this study. Section 5 summarizes the findings, outlines the research gaps, and suggests possible subjects for future research and Section 6 concludes the paper. Specifically, this study addresses the following research questions:

- What are the evolutionary publication trends and patterns concerning business technology tools among micro-entrepreneurs?
- Which authors, journals and countries are the most prolific and influential in this research landscape?
- What are the emerging themes and what future research agendas can be derived to further empower micro-entrepreneurs globally?

2. Literature Review

Business technology covers a massive range of daily tasks. Owners use software, cloud platforms, and mobile apps to do everything from finding new market opportunities and registering their company to running marketing campaigns and tracking sales. Fernando et. al. (2023) point out that these solutions frequently include e-commerce setups and customer relationship management (CRM) systems. Large corporations are not the only ones buying this software. Micro-entrepreneurs also rely heavily on these tools, even though they usually work with extremely tight budgets (Joseph et al., 2025). The International Labor Organization (ILO) defines a micro-enterprise as a business with five or fewer workers. Despite their lack of upfront funding, these tiny companies can pivot and grow surprisingly fast (Olarewaju, 2023). Because every industry is moving online, small business owners simply cannot afford to ignore these digital solutions.

Small businesses constantly fight an uphill battle. They lack cash, struggle to reach new buyers, and have to compete directly with massive corporations. Everyday software helps level this playing field. Instead of buying expensive hardware, owners can use affordable cloud systems like Google Workspace or Microsoft 365 to store files and collaborate (Ramya & Rajeswari, 2023). Social media also completely changes how they advertise. Rather than paying for massive ad campaigns, they use these platforms to find and talk to customers directly for almost no cost (Supriyadi & Ramadhan, 2025). Mobile apps are just as important for speeding up daily work (Aryeh-Adjei et al., 2025). A simple smartphone lets an entrepreneur message clients, track sales, and close the apps instantly from anywhere (Athaide et al., 2025). Finally, setting up a digital shop through an e-commerce platform guarantees they stay visible. Without that online footprint, they risk falling entirely out of touch with how modern consumers actually want to shop (Tunio et al., 2023).

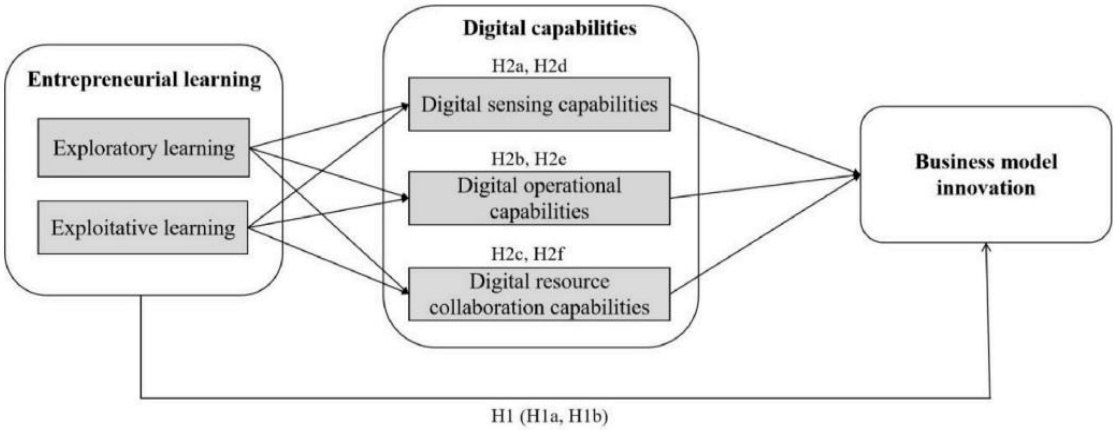
Trends and Patterns on Business Technology Tools and Services among Micro Entrepreneurs: Looking at the publication data reveals a few clear patterns. Scholars now care less about whether a small business simply owns technology and more about how they actually use it to survive and stand out. For example, da Silva and Sehnem (2025) point out that merely downloading an app or adopting a tool is not enough. Researchers must evaluate how well these owners apply the software in their daily work. Because of this shift, the number of papers focusing on specific, everyday tools like online stores, Software-as-a-Service (SaaS) platforms, and social media marketing has increased recently (Ruvoletto, 2023). As the broader digital economy grows, academics are paying much closer attention to what this means for the smallest businesses, especially those operating in developing countries (Joseph et al., 2025).

The data also shows that researchers from different fields are teaming up more often. We are now seeing business scholars, sociologists, economists, and computer scientists working together to study this group. This cross-collaboration happens because getting a small business owner to adopt new software is rarely just a technical problem. Mukherjee (2023) argues that academics need better models to capture the messy, real-world social and financial pressures these entrepreneurs actually face. Clearly, digital tools keep these tiny businesses running. Yet, simply acknowledging the benefits of software does not guarantee that owners will use it. Academics still need to figure out exactly what holds micro-entrepreneurs back from pushing these platforms to their full potential. Ultimately, mapping out these publication trends shows us what works and what is missing. If tech developers, researchers and government officials want to truly support small-scale business owners, they have to stop working in silos and start designing solutions that fit the daily realities of the local market.

Characteristics and Importance of Micro Entrepreneurs: Micro entrepreneurs essentially hold the global economy together, especially in developing nations where families rely on these small ventures just to survive. Iga et al. (2025) Note that business owners usually share a few common traits. They operate with very little cash, hire few employees and sell strictly to their local neighborhoods. People typically start these companies for one of two reasons. They either desperately need the extra income to get by or they spot a local market gap and want to turn a personal passion into a profit (Tan, 2023). The impact of these tiny businesses is hard to ignore. They create jobs from the ground up, drive local spending and pull families directly out of poverty (Herman, 2026). In fact, micro-enterprises employ millions of people globally who would otherwise struggle to find traditional wage work (Magida et al., 2025). Because they are so small, these owners can pivot instantly when local demands change, building incredible economic resilience. Putro et al., (2022) even found that beyond just making money, micro-entrepreneurs build deep social trust and actively bring their communities closer together.

Technology clearly opens doors for small business owners, though they still face steep financial and technical hurdles. Mobile banking apps, however, completely bypass the need for physical banks, giving owners instant access to financial tools (Agyei-Boapeah et al., 2022). Social media acts in a similar way. Owners use it to build brand loyalty and talk directly to buyers without needing a massive advertising budget (Yosep et al., 2021). Figure 1 maps out how these digital tools actually trigger deeper business model innovation. Entrepreneurs constantly absorb market feedback and learn from daily failures. This continuous learning builds their ability to think strategically and solve problems on the fly (Xiang et al., 2024). When an owner combines this everyday experience with solid digital skills, they can spot new opportunities and completely reinvent how their company operates. Ultimately, upgrading a traditional business today requires both a willingness to learn and the technical know-how to pull the transformation off.

Figure 1: Business Model Innovation by Xiang et al (2024)



Evolution of Research in Business Technology for Micro Entrepreneurs: Today, research priorities are shifting alongside the global economy. Instead of just asking if a business adopted a new tool, modern studies look at the messy socio-economic reality the owner actually lives in (Grassi & Toschi, 2021). We urgently need to understand how these tiny businesses approach communication tech Amouri et al. (2021) point out that micro-entrepreneurs deal with strict financial limits, a fear of taking risks, and a lack of technical skills. These technical hurdles directly show whether they will actually use a digital platform. Moving forward, tracking these publication trends will help us see exactly how technology impacts not just a single business's performance, but the economic survival of the surrounding community.

Researchers are paying close attention to the impact of online storefronts. Yosep et al. (2021) show that small business owners depend heavily on e-commerce platforms and digital marketing to find new buyers and keep them engaged. Social media plays a massive role in this process. Instead of sticking to traditional advertising, owners actively use these networks to build tight-knit communities and manage client relationships (Son & Niehm, 2021).

Financial technology (FinTech) is another major focus area. These apps give micro-entrepreneurs practical ways to bypass traditional banks for everyday payments and business loans. Using FinTech directly improves their financial literacy and makes securing working capital much easier (Hidayat & Kurniawan, 2024). Bringing all these tools together fundamentally changes how a micro enterprise operates. To explain why some owners still struggle with this digital transition, academics often rely on the Technology-Organization-Environment (TOE) framework (Al-Hadwer et al., 2021). This model proves that adopting new tech involves much more than simply downloading software. Business owners face intense operational and environmental roadblocks that dictate their success. As outlined in Table 1, these specific tools support daily operations and spark local economic growth. Today, going digital is simply a basic requirement for survival. If micro-entrepreneurs want to keep their doors open, they have to adapt.

Table 1: List of Business Technology Tools and Services Used to Support Business Processes Among Micro Entrepreneurs

Business Technology Tools and Services	Business Process Supported	Example of Applications	Sources
Digital Marketing Tools	Social Media Platforms	Facebook, Instagram, TikTok, Twitter, LinkedIn	(Pourazad et al., 2023)
	Email Marketing	Mailchimp, Sendinblue, Constant Contact	(Pothuri, 2021)
	Content Creation Tools	Canva, Adobe Spark, Buffer	(Tunmise & Amanda, 2024)
	Search Engine Optimization (SEO) Tools	Google Analytics, Moz, Ahrefs, Search Engine Marketing (SEMrush)	(Daruka & Damle, 2023)
E-commerce Platforms	Online Marketplaces	eBay, Etsy, Shopee, Lazada	(Zabidi et al., 2022)

	Website Builders	Shopify, Wix, Squarespace, WooCommerce	(Blancaflor & Samonte, 2023)
	Payment Gateways	PayPal, Stripe, Square, Razorpay	(Stehniei, 2021)
Financial Management Tool	Accounting Software	QuickBooks, Xero, Wave, FreshBooks	(Maruschak, 2021)
	Expense Tracking Apps	Expensify, Mint, PocketGuard	(Mosteanu & Faccia, 2020)
	Invoicing Tools	Zoho, Invoice, Invoice2Go, FreshBooks	(Caclini, 2022)
Customer Relationship Management (CRM) Systems	Basic CRM Tools	HubSpot, Zoho CRM, Salesforce, Insightly	(Anbari & Deng, 2022)
	Contact Management Apps	Google Contacts, Outlook, Contacually	(Dhanalakshmi et al., 2020)
	Customer Feedback Platforms	SurveyMonkey, Typeform, Google Forms	(Bevec & Vehovar, 2021)
Project Management Tools	Task Management	Trello, Asana, Monday.com, ClickUp	(Bacbkib & Bepetehhikoba, 2023) (Jackson et al., 2022)
	Collaboration Tools	Slack, Microsoft Teams, Google Workspace	(Vasyliuk & Basyuk, 2021)
	Time Tracking	Toggl, Clockify, Harvest	
Inventory Management Systems	Inventory Tracking	TradeGecko, Zohon Inventory, Ordoro	(Kurdi et al., 2022)
	Point of Sale (POS) Systems	Square POS, Vend, Lightspeed	(Petrov, 2023)
Communication and Collaboration Tools	Video Conferencing	Zoom, Google Meet, Microsoft Teams	(Sevilla, 2020)
	Instant Messaging	WhatsApp Business, Telegram, Signal	(Conde et al., 2021)
	File Sharing and Storage	Google Drive, Dropbox, OneDrive	(Marciano & Maynard III, 2023)
Supply Chain Management Tools	Logistics Management	ShipStations, Shippo, Easyship	(Gatti, 2023)
	Supplier Management	Procurify, SAP Ariba, Tradeshift	(Rutkoski, 2024)
Mobile Applications	Mobile Payment Solutions	Google Pay, Apple Pay, Paytm	(Pachabotla & Konka, 2022)
	Business Apps	Evernote, Microsoft Office	(Manko, 2022)
Cybersecurity Tools	Basic Security	Mobile, Google My Business Norton, McAfee, Kaspersky	(Shaikh et al., 2021)
	Password Management	LastPass, 1Password, Dashlane	
	Data Backup Solutions	Carbonite, Acronis, Backblaze	(Carr & Shahandashti, 2020) (Marshall, 2023)
Artificial Intelligence (AI) Tools	Chatbots	ManyChat, Tars, Drift	(Bahattab, 2024)
	AI-based Analytics	Google AI, Microsoft AI, IBM Watson	(Mittal et al., 2021)
	Recommendation Engines	Amazon Personalize, Salesforce, Einstein	(Rainsberger, 2022)
Cloud Services	Cloud Computing	Amazon Web Services (AWS), Microsoft Azure, Google Cloud	(Gupta et al., 2021)
	Software as a Service (SaaS)	Slack, Salesforce, Zoom	(Rrucaj, 2023)
Human Resource Management Tools	Recruitment Tools	Indeed, LinkedIn Recruiter, Workable	(Vardarlier & Ozsahin, 2021)
	Payroll Systems	Gusto, Paychex, ADP	(Olumoh et al.)
	Employee Management	BambooHR, Zenefits, Rippling	(Koulopoulos & Palmer, 2024)
Sustainability-Focused Tools	Energy Management Software	GridPoint, EnergyCAP, Schneider Electric	(Lago et al., 2024)
	Waste Management Apps	Recycle Coach, TerraCycle, iRecycle	(Ócsai & Ócsai, 2021)
Educational and Training Tools	Online Learning Platforms	Coursera, Udemy, LinkedIn Learning	(Alojaiman, 2021)
	Skill Development	Skillshare, Khan Academy, edX	(Asante, 2024)

Table1 shows just how many software options small business owners now have at their disposal. They can choose from a wide variety of platforms, covering everything from basic customer relationship management (CRM) systems to niche sustainability apps. Although not every entrepreneur adopts this entire suite of tools, the research agrees on one main takeaway. Using even a few of these programs actively cuts down on daily operational transactions and helps owners find new buyers.

3. Methodology

We used a quantitative, bibliometric approach to review the existing academic literature. Tracking this data lets us map out exactly how publication rates, author collaborations and core themes have shifted over time. Ultimately, this method directly answers our primary research question: What are the current trends and patterns in studies on micro-entrepreneurs and business technology.

To do this, we pulled all of our raw publication data directly from the Scopus database. From there, we fed the records into VOSviewer software. We relied on specific techniques, namely co-citation analysis, keyword co-occurrence and network mapping, to build a clear, visual picture of how different research topics actually connect. A structured search was formulated using keywords that capture the essence of the research focus, which include micro entrepreneurs, business technology tools, technology services for micro entrepreneurs, digital tools for business and small business innovations. Boolean operators such as AND, OR, NOT were employed to refine the search results. The search was limited to articles published in English to ensure standardization for the keyword co-occurrence analysis and to maintain a focus on widely accessible, peer-reviewed international literature and publications from 2004 to 2024 to ensure the relevance of the literature to current trends, as shown in Table 1. A total of 215 articles published in Scopus were considered based on selected filtering as shown in the following Search String:

Search String: TITLE-ABS-KEY ((("micro entrepreneur*" OR "microenterprise*" OR "micro business*" OR "micro enterprise*") AND ("business technology tool*" OR "digital tool*" OR "technology adoption*" OR "digital service*" OR "business technology service*" OR "ICT adopt*" OR "technology solution*") OR (mobile AND app*) OR (cloud-based AND service*))) AND (LIMIT-TO (LANGUAGE, "English"))

As stated in the Search String, filtering of documents was based on the English language only; the publication year ranges from 2004 to 2024, and document types selected include article, conference review, conference paper, book chapter, review and editorial contributing to 215 documents extracted for the analysis. This volume of articles indicates a substantial body of literature related to this study, suggesting that it is an area of active research and interest. One article was excluded that referred to Spanish document language. The volume of articles published and a comprehensive summary of the criteria used to collect the Scopus data are depicted in Table 2. This ensures that the analysis is focused on recent and relevant literature selected for this study. The exclusion of documents in languages other than English helps maintain the focus on more substantial and comprehensive works.

Table 2: Data Collection Criteria and Articles Included in Scopus from 2004 to 2024

Search words	(“micro entrepreneur*" OR "microenterprise*" OR "micro business*" OR "micro enterprise*") AND ("business technology tool*" OR "digital tool*" OR "technology adoption*" OR "digital service*" OR "business technology service*" OR "ICT adopt*" OR "technology solution*") OR (mobile AND app*) OR (cloud-based AND service)
Year published	2004 -2024, N=221
Database	Scopus
Language	English only, N=215 (Exclude: Spanish=4, Chinese=2)
Research limitations	Article (100), Conference Review (18), Conference paper (76), Book chapter (14), Review (6) and Editorial (1), N=215
Subjects	Computer Science, Business, Management and Accounting, Social Sciences, Engineering, Economics, Econometrics, and Finance, Decision Sciences, Mathematics, Environmental Science, Energy, Physics and Astronomy, Psychology, Medicine, Arts and Humanities, Multidisciplinary, Agricultural and Biological Science, Nursing, Earth and Planetary Sciences.

This study applied VOSviewer software version 1.6.20 to analyze the publishing trends and most prolific journals, disciplines, authors, institutions, countries, studies, and subjects. Co-citation analysis to systematize the most fundamental articles published between 2004 and 2024. Co-citation analysis is a popular bibliometric tool for identifying commonalities between cited papers. The most influential subjects were analyzed using the fractional counting approach, with each keyword's number of occurrences corrected for the total number of keywords used in the title, abstract, or keyword list for the same article. This approach is preferable to simple counting since it generates a bibliometric network with each connection assigned a fractional weight, resulting in a tighter association between two terms. The fractional counting approach is more suitable for bibliometric networks involving fewer keywords.

Detailed bibliographic information was extracted including title, authors, publication year, journal name, volume and issue number, keywords, abstract and citation counts. Bibliometric techniques such as descriptive analysis, citation analysis, co-authorship analysis and keyword co-occurrence analysis were conducted using VOSviewer software for creating visualization of the bibliometric analysis and to identify prevalent research themes and emerging trends, and MS Excel for organizing the data and performing preliminary statistical calculations. Visual representations include histograms, network graphs and word clouds.

4. Bibliometric Analysis

Annual Publication Trends: Figure 2 illustrates the trends displayed by the 215 Scopus-indexed articles in different subject areas from 2004 until 2024.

Figure 2: Articles Included in Scopus from 2004 Until 2024

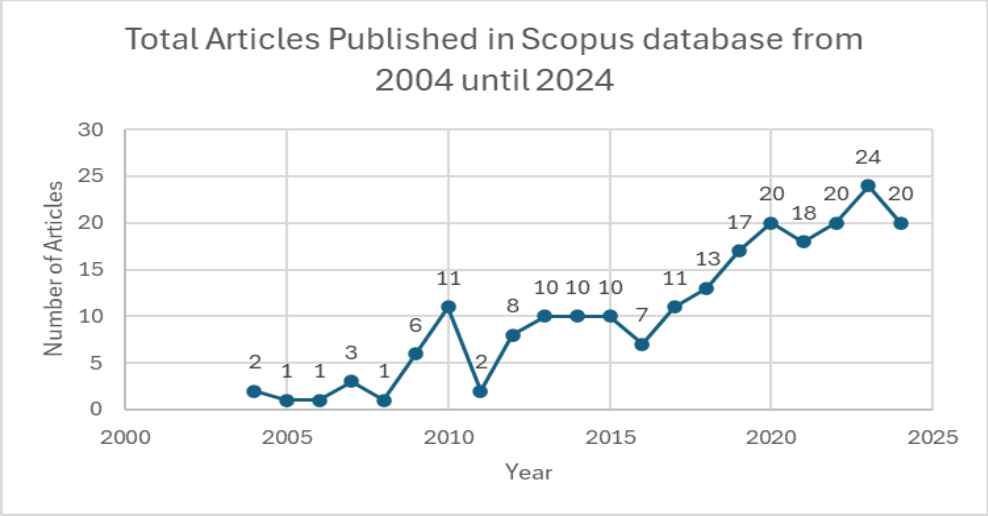


Figure 2 indicates an impressive increase in publications from 2 papers in 2004 to a staggering 215 papers in 2024 published in English. In particular, the sharp increase in publications leading up to 2024 likely reflects the accelerated digital transformation forced by the global COVID-19 pandemic, which forced remote operations and digital commerce for survival. The data clearly shows a massive spike in interest regarding small business technology. More academics are now testing whether these new tools actually help owners cut waste, reach buyers, and work faster. At the same time, this puts micro-entrepreneurs in a tough spot. They have to stay competitive in a digital market while figuring out how to use software that changes almost daily.

The sheer volume of papers published between 2004 and 2024 proves that researchers are paying attention. It shows the academic world finally recognizes that technology dictates whether a micro-enterprise survives over the long term. Part of this publication boom simply comes from how easy it is to share work online today. Open-access journals let a much wider range of researchers jump into the conversation. Naturally, as new software hits the market, scholars want to test if it actually works for small-scale users. Because of this, we are seeing a major shift in who conducts the research. Experts in business, IT, sociology, and economics are teaming up rather than working alone. Bringing all these different viewpoints together leads to far more practical, grounded conclusions.

All this new research directly helps small business owners figure out how to actually use digital tools. In the past, enterprise software was often far too expensive and complex for a one-person shop. Now, as academics and developers pay closer attention to this market, these platforms are being scaled down to fit the exact needs of micro-enterprises. Academic studies also produce practical guides and frameworks. Owners can use these models to cut through the marketing noise and figure out which apps are actually worth their limited budget. Ultimately, when researchers share clear best practices, micro-entrepreneurs stop guessing. They can apply these findings directly to their daily work, keeping their businesses profitable over the long haul.

Prolific Source Title and Source Area: Table 3 breaks down exactly where these 215 articles were published. The ACM International Conference Proceedings Series leads the group, accounting for 10 of the papers (4.65%). Right behind it is the Electronic Journal of Information Systems in Developing Countries, which published another 7 articles (3.26%).

Table 3: Top Twelve Source Titles of Articles Published Related to The Study

Source title	Total
ACM International Conference Proceeding Series	10
Electronic Journal of Information Systems in Developing Countries	7
Lecture Notes in Computer Science (including subseries Lecture Notes in Artificial Intelligence and Lecture Notes in Bioinformatics)	6
Technological Forecasting and Social Change	6
IFIP Advances in Information and Communication Technology	6
16th Americas Conference on Information Systems 2010, AMCIS 2010	4
Communications in Computer and Information Science	3
Lecture Notes in Networks and Systems	3
Proceedings of the Annual Hawaii International Conference on System Sciences	3
IEEE Microwave Magazine	3
Information Technology for Development	3

The ACM series acts as a primary landing spot for researchers and developers to test out brand new ideas, making it a critical resource for anyone trying to build or study tech built specifically for small-scale operations.

The Electronic Journal of Information Systems in Developing Countries takes the second spot with seven papers, making up 3.26% of our sample. This journal zeroes in on how businesses operate under tight resource limits, which fit the exact reality most micro-entrepreneurs face. Instead of just sharing high-level theory, its article offers practical ways for owners to actually adopt accessible tech. These publication trends matter because they prove that academic journals are not just talking to other scholars. They are creating a reliable playbook that small business owners, advisors and tech developers can use to keep up with industry shifts.

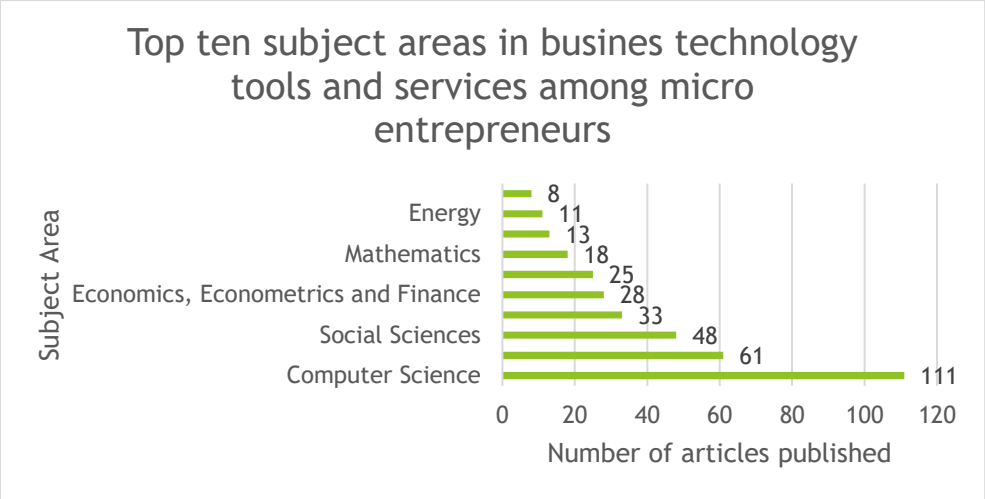
Because micro-enterprises make up such a huge chunk of the economy, especially in developing regions, giving these owners the right tech can trigger massive financial growth. Finding trustworthy, research-backed advice helps them make smart moves that strengthen both their own shops and their local communities. Table 4 and Figure 3 map out the top ten subject areas covering micro-business tech. Computer Science easily takes the top spot with 111 articles, while Business, Management and Accounting (61) and Social Sciences (48) follow behind. This specific mix of disciplines highlights the core trends shaping how these tiny businesses actually operate.

Table 4: List of Subject Areas for Articles Published Related to Business Technology Tools and Services Among Micro Entrepreneurs.

Subject Area	Count
Computer Science	111
Business, Management and Accounting	61
Social Sciences	48

Engineering	33
Economics, Econometrics and Finance	28
Decision Sciences	25
Mathematics	18
Environmental Science	13
Energy	11
Physics and Astronomy	8
Psychology	6
Medicine	6
Arts and Humanities	6
Multidisciplinary	2
Agricultural and Biological Sciences	2
Nursing	1
Earth and Planetary Sciences	1

Figure 3: Top Ten Subject Areas for Articles Published Related to Business Technology Tools and Services Among Micro Entrepreneurs



Having 111 articles in Computer Science shows just how heavily modern business relies on technical software. Small business owners do not just need general advice; they use actual apps, automated programs, and data dashboards to cut waste and handle daily customer messages. The Business, Management, and Accounting field comes next with 61 articles. These studies focus on the practical side of running a shop, like budgeting, long-term planning and streamlining daily tasks. Combining tech tools with sound business management helps these owners make smarter calls and keep their companies profitable over time.

Social Sciences accounts for 48 articles, shifting the focus directly to the human side of going digital. This branch of research looks at how buyers act online, how local social networks operate, and how adopting software changes a community's daily life. Micro-entrepreneurs need these insights just as much as technical tools. Understanding local social habits helps owners design products people actually want, target their social media marketing, and build real trust with local buyers in crowded markets.

Prolific countries: Citation by countries with a minimum number of documents of a country is 7 and minimum number of citations of a country is 20. The result generated shows that out of the 58 countries, 9 meet the thresholds as shown in Figure 4 and Figure 5. The top countries contributing to this bibliometric analysis were dominated by India with 24 articles, followed by South Africa with 23 articles and the United States with 22 articles.

Figure 4: Top Nine Countries That Published More Than Ten Articles or Scientific Production of the Main Countries Related to Trend and Patterns of the Business Technology Tools and Services Among Microentrepreneurs

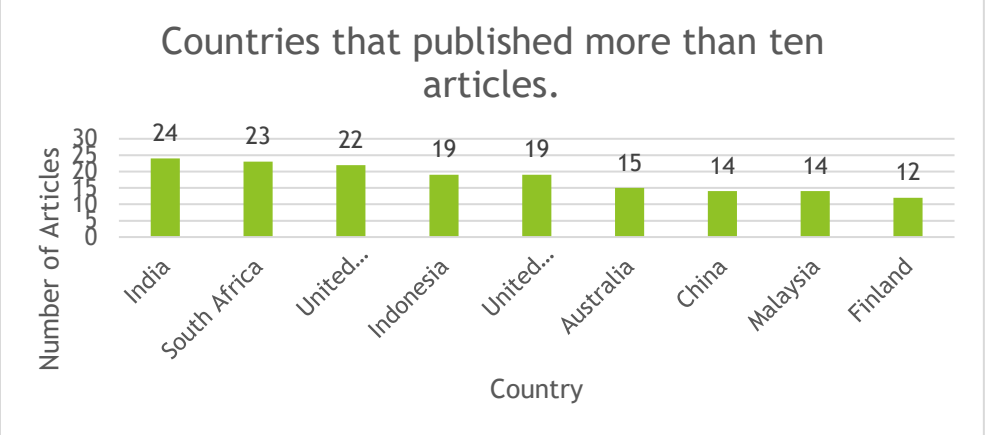
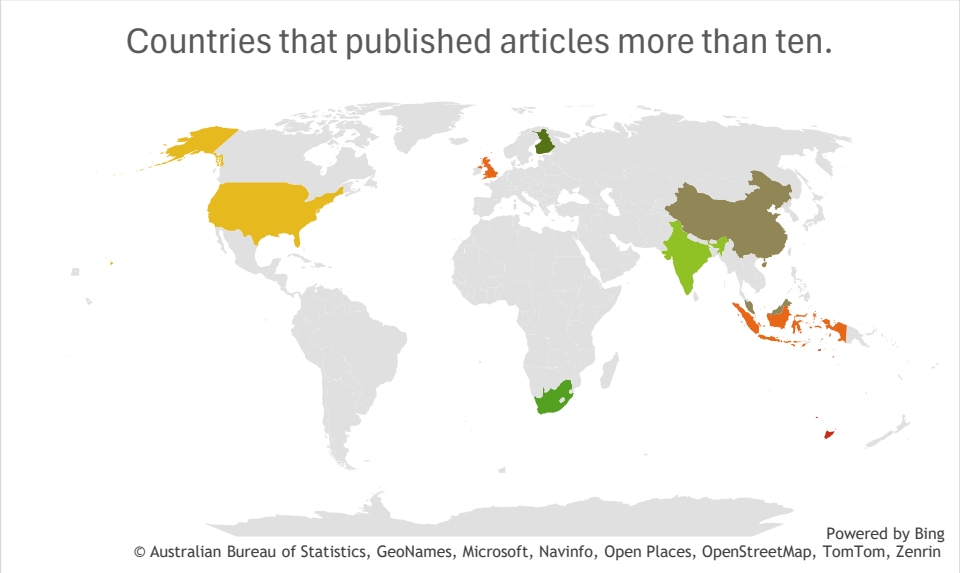


Figure 5: World Map of the Top 9 Countries Contributing to the Publications in This Study



Bibliometric analysis plays a crucial role in understanding the impact and contribution of various countries to a specific field of study. This study reveals significant insights into the contribution of 58 countries regarding micro entrepreneurs and the business technology tools and services that support them. Particularly, the analysis establishes a minimum threshold for the number of documents at seven and a minimum citation count of 20, leading to the identification of nine countries that meet the criteria. The bibliometric analysis revealed a clear dominance of certain countries in this are with India leading the pack. Figures 4 and 5 show that India produced 24 articles, leading the research on software for micro-enterprises. South Africa follows closely with 23 papers, while the United States contributed 22. This global spread shows how different countries prioritize small-business technology in distinct ways. These publication numbers directly impact real-world operations. Since tiny companies form the backbone of emerging economies, understanding how to adopt accessible tools helps these owners streamline daily tasks, find new buyers and stay in business over the long run.

Given its huge publication output, India acts as a major testing ground for digital tools built specifically for very small businesses. Research from this region offers clear examples of how micro-enterprises use simple mobile apps, payment networks and online marketplaces to scale up. Meanwhile, studies out of South Africa bring a

different, highly valuable angle. Rather than focusing purely on app features, South African scholars look closely at local socio-economic realities. They highlight the specific daily hurdles these business owners face and evaluate localized software designed to work around poor infrastructure and tight cash flow. As a global leader in technology innovation, the contribution from the United States may focus on cutting-edge business technologies that can be adopted by micro entrepreneurs worldwide. The insights garnered here could revolve around the best practices and tools that have emerged from more developed markets, thus providing a benchmark for emerging economies.

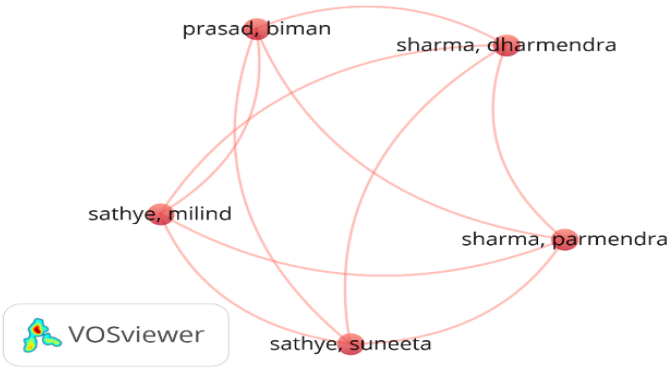
Prolific Authors: The minimum number of citations for an author is five, and six of the 532 writers satisfy this requirement. This research determined the overall strength of co-citation relationships with other writers for each of the six authors. Figures 6 and 7 illustrate which writers had the highest overall link strength. In a co-citation analysis, two works are deemed co-cited if they are both cited by the same third work. The number of co-citations between two works determines the strength of the relationship. According to the results shown in Figures 6 and 7, there are five top author works that have a similar number of citations: Biman Prasad, Milind Sathye, Suneeta Sathye, Dharmendra Sharman, and Parmendar Sharma, who contribute 36 citations and are most frequently cited by others with a similar total link strength. Authors such as Prasad, Sathye and Sharma emerge as foundational in this network, frequently co-cited for their early frameworks establishing the baseline constraints and socio-economic factors influencing micro business technology adoption. The result for each of the six writers who met the criterion displays the overall strength of the authors' co-citation linkages with other authors. This shows that his work is regarded as basic in the field of business technology tools and services for micro entrepreneurs, as well as having an impact on the direction of future research.

Figure 6: Co-Citation Analysis Based on Author List

Selected	Author	Documents	Citations	Total link strength
☑	prasad, biman	6	36	24
☑	sathye, milind	6	36	24
☑	sathye, suneeta	6	36	24
☑	sharma, dharmendra	6	36	24
☑	sharma, parmendra	6	36	24

Co-citation analysis maps out how different academic works connect and influence one another. Out of 532 authors in our dataset, Figures 6 and 7 show that only six hit the minimum threshold of five citations. These few scholars form the core foundation of this research domain. Examining their citation strength helps us see who established the key frameworks and built the early models that modern micro-business studies still rely on today.

Figure 7: Map Of Co-Citation Analysis of The Most Relevant Publications in the Research Field Based on Authors' Names



These core authors are consistently cited together because they built the initial models for small-business tech adoption. Their early papers outlined the baseline financial, social and operational barriers that micro-entrepreneurs face when adopting new tools. Today, current scholars still rely on these foundational studies

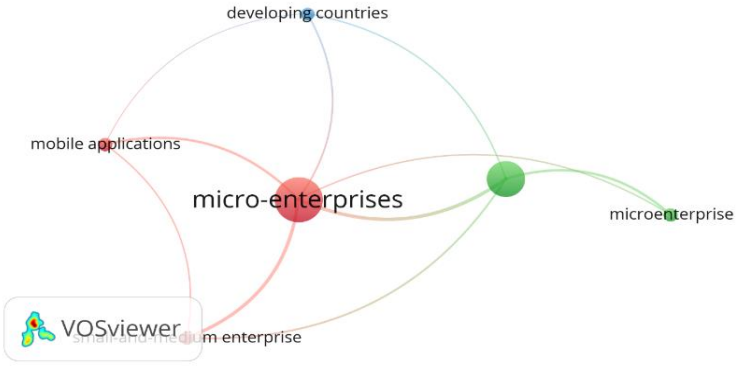
as a baseline when testing newer platforms, such as mobile apps, e-commerce setups, and automated accounting software.

Key Word Analysis: Keyword co-occurrence measures how often two terms appear together in an article's title, abstract, or keyword list, revealing strong thematic links across the literature. Tracking these keyword relationships helps show how research on small-business tech is actually structured, especially in emerging economies. To map these themes, we extracted 1,418 keywords from the Scopus dataset using full counting across all keyword fields. Setting a minimum threshold of 15 occurrences narrowed the dataset down to six core terms. These primary keywords represent the most dominant, influential concepts driving current academic discussion in this field.

Figure 8: Word Tree Map for The Timespan 2014–2018. Source: Scopus

Selected	Keyword	Occurrences	Total link strength
☑	micro-enterprises	53	49
☑	technology adoption	42	34
☑	small-and-medium enterprise	16	24
☑	mobile applications	16	13
☑	microenterprise	16	12
☑	developing countries	15	8

Figure 9: Word Tree Map for The Timespan 2014–2018. Source: Scopus



Figures 8 and 9 highlight the primary terms driving this literature. "Micro-enterprises" leads with 53 occurrences, reflecting the massive academic focus on small, often informal ventures that power local economies. "Technology adoption" follows closely in second with 42 occurrences, capturing how these tiny firms actually shift toward modern digital tools to boost daily productivity and reach buyers. "Small and medium enterprises" ranks third (16 occurrences), providing a broader baseline to compare micro-business strategies against larger corporate operations. Tied for fourth is "mobile apps" (16 occurrences). As smartphone access expands globally, researchers increasingly focus on mobile software as the primary engine for speeding up daily tasks and expanding market access.

"Microenterprise" also appeared 16 times, overlapping heavily with "micro enterprise" to highlight the distinct operational hurdles and community-level economic impact of tiny firms. Finally, "developing nations" rounded out the list with 15 occurrences. This term shows the heavily localized nature of the research, stressing that software must be designed around the specific infrastructure and socio-economic constraints of resource-limited markets.

Discussion

While current studies offer a solid start, academics must produce far more accessible, actionable research built explicitly for small business owners. Enterprise software can feel overwhelming, and dense theoretical papers

rarely offer practical help. Closing this gap requires direct collaboration between researchers, software developers and business owners to ensure academic insights actually turn into usable real-world tools. The heavy overlap between Computer Science, Business and Social Sciences provides a clear blueprint of this transition. Small-scale entrepreneurs do not just need raw software; they need to know how digital tools fit into their daily management routines and customer relationships. Combining technical tools with traditional business practices helps these owners make smarter decisions, cut operational waste, and stay competitive despite tight budgets.

Leading countries, India, South Africa and the United States are driving research at the exact point where software meets small-scale entrepreneurship. As more regions contribute to this space, scholars can share cross-border data to build better support systems for small business owners globally. The payoff goes far beyond speeding up daily work. Adopting the right software can reshape entire local markets. Pooling data from both emerging and developed economies gives us a much clearer picture of what actually works, making it easier to design adaptable, scalable tools that fit real-world business needs.

The strong link between our six primary keywords, “micro-enterprise” (53), “technology adoption” (42), “small and medium enterprise” (16), “mobile application” (16), “microenterprise” (16) and “developing countries” (15) proves that tech usage directly dictates micro-business survival. The particularly high link strength between “micro-enterprises” and “technology adoption” points to a clear area for deeper research. More importantly, the tight connection between “mobile applications” and “developing countries” reveals a vital real-world trend. Mobile-first tools allow business owners to jump right over weak traditional infrastructure. In resource-strapped regions, smartphones act as the main gateway to digital tools. Going forward, scholars, developers, and policymakers must keep these patterns in mind when building support programs. Designing tech around these specific local habits is the best way to help small businesses handle market shocks and keep growing over time.

5. Implications and Conclusion

Theoretical Implications: This study highlights a significant change in the academic focus from basic technology models toward understanding long-term digital sustainability. For example, recent 2026 empirical frameworks evaluating women-led micro-enterprises in Indonesia demonstrate that variables like digital literacy and financial inclusion must be integrated into causal models, as technology access acts as an enabler that directly boosts an entrepreneur’s intrinsic motivation and self-development (Pranitasari et al., 2026). Future theoretical frameworks, such as the Technology-Organization-Environment (TOE) model, must be expanded to include variables like entrepreneurs’ self-efficacy and local digital ecosystem support. Next, the bibliometric data reveals a high concentration of research in specific emerging economies, particularly in India and South Africa. For instance, 2025 studies tracking agribusiness micro-entrepreneurs in rural Uganda emphasize that theoretical focus must shift from not just “adoption” to “agency” which explores how simple digital footprints from mobile money apps create alternative credit scoring models for historically financially excluded populations (Eton et al., 2025). This highlights an urgent need for flexible, cross-cultural models that adjust for varying digital infrastructure, local network effects and regional socio-economic hurdles.

The heavy overlap between Computer Science, Business and Social Sciences proves that future research cannot rely on a single discipline. Theoretical models need to blend these fields. For instance, scholars are now building cross-disciplinary frameworks to test ho wan owner’s local social standing and cultural background affect their decision to ditch cash for e-payments (Bahasoan et al., 2026). To truly understand how micro-enterprises go digital, researchers have to pair software features with human-centered realities like customer trust and fear of new technology.

Practical Implications: Simply handing over hardware or software is not enough. Policymakers need to build supportive local ecosystems by funding peer-learning groups, subsidizing mobile internet, and running practical digital training. In Malaysia, for instance, combining subsidized 5G plans and devices with hands-on community workshops helped low-income entrepreneurs move past basic survival to expand their businesses (Chong et al., 2026). At the same time, software developers must create cheaper, far simpler mobile apps and Software-as-a-Service (SaaS) platforms. Tools need to fit the tight budgets and limited technical experience of

small-scale users. A great example comes from India, where inventory apps integrated voice-command AI and image-recognition "smart baskets," allowing women with limited digital skills to track their stock effortlessly (Abbas et al., 2025).

Small business owners need to realize that going digital directly impacts whether their enterprise survives or fails. Swapping paper accounting for a basic ledger app is an easy first step that creates a verifiable transaction history. Fintech firms can then analyze this data to issue working capital loans and seed grants without requiring collateral (Bredice et al., 2025). Beyond using these apps, micro-entrepreneurs should actively seek out local mentors who understand small-business tech, adopt low-cost mobile analytics and make basic cybersecurity a daily operational habit.

Conclusion

The growing body of literature on micro-business technology highlights a clear story of adaptation and economic survival. As digital tools become standard across every industry, small-scale owners have to stay flexible and rely on practical, evidence-based strategies to manage new software. Reaching 215 publications by 2024 shows that researchers are actively paying attention to the needs of micro-enterprises. When academics focus on the real-world obstacles these business owners face, they help build better operational strategies that can strengthen entire local economies.

Looking at the key publishing outlets like the ACM International Conference Proceedings Series and the Electronic Journal of Information Systems in Developing Countries shows where the core academic conversation is happening. Making this research easier to read and apply in the real world will help owners make far better software choices. The strong overlap across Computer Science, Business and Social Sciences proves that micro-business tech is never just a technical issue. Owners have to balance software features with daily management routines and customer relationships. Combining insights from all three fields gives entrepreneurs a practical guide to cutting operational waste and keeping their doors open over the long haul.

This bibliometric analysis maps the current academic conversation surrounding micro-enterprises and technology. With India, South Africa and the United States producing the highest volume of research, there is a clear opportunity for cross-border knowledge sharing. The models developed in these leading nations can directly inform the software tools and support programs built for small business owners worldwide. Encouraging international collaboration among scholars speeds up the delivery of practical, field-tested solutions to local entrepreneurs. Furthermore, co-citation analysis demonstrates how these foundational authors built the shared frameworks that continue to drive new research in small-business technology.

Keyword co-occurrence patterns highlight the foundational themes shaping current research on micro-enterprise tech. However, this study has clear limitations. The bibliometric dataset relies exclusively on Scopus. While Scopus offers extensive coverage, future research should incorporate Web of Science, Google Scholar or regional databases to capture a broader selection of non-English and interdisciplinary journals. These limitations point directly to several critical areas for future study. First, long-term tracking is needed to measure how digital tool adoption impacts actual firm survival and revenue over multi-year periods. Second, scholars should combine insights from sociology, marketing, and IT to build cross-disciplinary frameworks for technology adoption. Third, future work must evaluate how policy incentives and digital infrastructure grants directly affect adoption rates in rural areas. Finally, researchers need to develop standardized metrics to test which software features actually drive performance in resource-constrained environments. Building these practical, accessible research pipelines ensures academic studies continue to support real-world micro-business growth in the digital economy.

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