Specialized Accelerator for Pharmaceutical Exports: A Local Business Model Proposal

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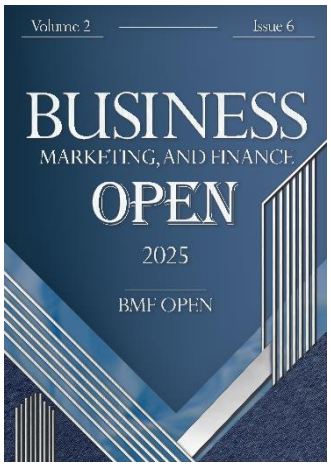

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Abstract: The model for fraud prevention in the public sector using forensic accounting is designed based on the identification and analysis of weaknesses in existing financial and administrative processes. Enhancing transparency and accountability in financial and administrative reports can help reduce the risk of fraud. Additionally, the use of modern technologies such as big data and advanced analytics can assist in detecting suspicious patterns and abnormal behaviors. Ultimately, this model must be designed to align with the specific cultural, economic, and political characteristics of each country or public institution to effectively prevent fraud and enhance public trust. Therefore, this study was conducted with the aim of proposing a model for fraud prevention in the public sector through forensic accounting. The data required for Interpretive Structural Modeling (ISM) was gathered through interviews with 15 experts, specifically senior managers in the public sector who held at least a master's degree in accounting or auditing and had experience in forensic accounting (judiciary-appointed experts). In this research, a model was designed using ISM. The results of the ISM structural analysis, through the exploratory model, indicated that the dimensions of integrating forensic accounting and big data technology include digital evidence collection, collaboration with cybersecurity experts, a robust line of defense against fraud, and the development of appropriate structures and processes. Forensic accounting encompasses fraud detection and analysis, training and expertise, and cooperation with legal institutions. Big data technology includes dimensions such as identifying anomalous patterns, analyzing multi-source data, and enhancing information security.

Keywords: Public sector fraud, fraud prevention, forensic accounting.

1. Introduction

The pharmaceutical industry plays an increasingly critical role in the global economy, not only as a sector linked to public health but also as a major contributor to national exports and technological innovation. Over the past two decades, pharmaceutical exports have gained strategic importance for both developing and developed countries, driven by globalization, regulatory harmonization, and digital transformation in supply chains [1]. Countries aiming to expand their pharmaceutical exports are compelled to design innovative and locally adaptable business models that can bridge global market demands with domestic capabilities [2]. In this context, the development of specialized export accelerators tailored for pharmaceutical products has emerged as a compelling strategy to promote competitiveness, innovation, and international market access, particularly in emerging economies.

The global landscape of pharmaceutical exports is shaped by a multitude of factors including regulatory policies, product quality, market access strategies, innovation capabilities, and integration into global value chains [3, 4]. For

example, top pharmaceutical exporters such as Germany, the United States, and India have adopted proactive export promotion policies and regulatory reforms to align their industrial capabilities with global standards [5, 6]. The Indian pharmaceutical sector, in particular, has achieved significant success by focusing on low-cost manufacturing, international certifications, and public-private partnerships to boost exports, especially to the European Union and African markets [1, 7]. This export-oriented transformation has been further enabled by institutional support mechanisms such as export councils, policy think tanks, and accelerator programs [8].

Nevertheless, the journey toward sustained pharmaceutical exports is far from linear. Developing countries like Iran face considerable challenges in this domain, including lack of targeted export strategies, weak branding and marketing, fragmented value chains, and limited international regulatory alignment [2, 9]. These structural constraints are exacerbated by geopolitical uncertainties, fluctuating exchange rates, and trade sanctions. For instance, Iran's pharmaceutical export performance is constrained by a heavy dependence on domestic regulatory models and insufficient integration into international health trade networks [10, 11]. At the same time, the potential for pharmaceutical export growth remains considerable given the country's advanced manufacturing capacity, skilled human capital, and growing experience in niche markets [12].

A review of successful export practices underscores the necessity of designing context-sensitive business models that account for both external market trends and internal organizational competencies [13]. Export accelerators—specialized institutions that support startups and SMEs in overcoming export barriers—offer a strategic mechanism for achieving this alignment. While generic accelerators have become widespread, there is increasing recognition of the need for sector-specific models tailored to the unique regulatory, technological, and logistical requirements of pharmaceuticals [14, 15]. This includes support for market research, intellectual property management, product adaptation, international compliance, and digital export platforms [16, 17].

In countries like Thailand and Jordan, recent studies have highlighted how marketing capabilities, supply chain resilience, and sourcing strategies significantly affect the international performance of pharmaceutical firms [18, 19]. During the COVID-19 pandemic, the agility of pharmaceutical exporters in responding to supply chain disruptions demonstrated the need for integrated and anticipatory export models supported by innovation and foresight [20, 21]. Furthermore, digitalization has reshaped the traditional pharmaceutical export paradigm by introducing e-commerce channels, data-driven marketing, and AI-powered customer analytics [22, 23]. These developments suggest that future pharmaceutical export strategies must go beyond logistical and regulatory compliance to incorporate dynamic capabilities such as digital marketing, strategic networking, and market intelligence systems.

Within this evolving landscape, the role of regulatory environments cannot be overstated. Regulatory convergence—through mutual recognition agreements and international certification—is now a cornerstone of export success [3, 24]. Countries like Russia and China have increasingly refined their pharmaceutical regulatory frameworks to accommodate global export demands, including simplified drug registration, GMP compliance, and digital dossier systems [25, 26]. However, many developing countries still operate within fragmented or rigid regulatory systems that impede rapid adaptation to global changes. For instance, Iran's pharmaceutical policy remains highly centralized, with limited flexibility for private sector initiatives and a lack of coordinated export governance [2, 8].

Moreover, effective pharmaceutical export strategies require not only organizational agility but also institutional and inter-organizational cooperation [14, 27]. As highlighted by Voitovych et al. (2022), market interactions across borders involve dynamic strategic management, including marketing alliances, channel partnerships, and customer

co-creation [13]. Similarly, export accelerators must act as platforms that foster collaboration among academia, regulatory bodies, financial institutions, and industry players [12, 16]. In this regard, business model innovation plays a central role in configuring such partnerships to support sustained value creation.

The Iranian pharmaceutical sector, though technologically capable, lacks a consolidated business model to guide the structure, operation, and scaling of export accelerators. Existing institutions often fall short in areas such as client segmentation, revenue modeling, service delivery, and ecosystem engagement [6, 9]. To bridge this gap, there is an urgent need for a localized, evidence-based, and scalable business model that aligns with both the domestic realities of the Iranian pharmaceutical industry and the expectations of international markets [23, 27]. Such a model must draw from global best practices while also accounting for contextual factors such as regulatory constraints, resource limitations, and cultural specificity.

This study aims to fill this critical gap by designing a context-specific business model for a specialized pharmaceutical export accelerator in Iran.

2. Methodology

This study adopts an applied, exploratory, and qualitative research design, structured to investigate and develop a localized business model tailored for a specialized pharmaceutical export accelerator. The research is applied in its purpose, aiming to generate actionable insights for designing effective business models in the pharmaceutical export domain. The level of abstraction remains conceptual and theoretical but is firmly rooted in a specific and practical context. Given the limited pre-existing knowledge about how to systematically structure business models for pharmaceutical export accelerators—especially within the local or regional environment—the study employs an exploratory approach. Exploratory studies are essential when a phenomenon is insufficiently understood or when past solutions to similar problems cannot be readily transferred to the current context. These types of studies help to generate an initial conceptual framework by engaging in broad, in-depth exploration with subject matter experts.

This research, accordingly, uses qualitative methodology, collecting rich narrative data through semi-structured interviews with 13 carefully selected experts. The study was conducted in two sequential phases. The first phase included a comprehensive literature review to synthesize theoretical and empirical findings on business models, accelerators, pharmaceutical exports, and related frameworks. This phase produced an initial theoretical foundation to guide the next stage. In the second phase, the core qualitative investigation was undertaken through in-depth, semi-structured interviews. Using snowball sampling, the researcher identified and interviewed experts from various stakeholder groups, including pharmaceutical company executives, health-sector accelerator managers, university professors, pharmaceutical trade consultants, officials from the Food and Drug Administration, and export development fund specialists.

The selection of participants followed purposive and judgmental criteria, aiming to ensure that interviewees had sufficient subject-matter expertise. Eligibility required that participants met at least one of the following criteria: having a minimum of five years of professional experience in relevant fields such as pharmaceutical acceleration, export strategy, or policy-making; possessing a significant academic track record such as publication of scientific articles, theses, or books in areas like pharmaceutical export or business modeling; or holding a university degree in pharmaceutical sciences, drug economics, entrepreneurship, business administration, or international trade. The total number of participants (13) was determined based on the principle of theoretical saturation, meaning that data collection ceased when no new significant insights emerged.

Data collection relied primarily on semi-structured, in-depth interviews as the main tool, in accordance with the fieldwork-based nature of this study. This approach was chosen to accommodate the exploratory aim of the research, allowing participants the flexibility to elaborate on complex, experience-based insights while enabling the researcher to guide the conversation within the theoretical framework developed during the literature review phase. The interviews were conducted in person or online depending on the availability of the participants and recorded with their consent. Each interview lasted approximately 45 to 90 minutes.

To ensure credibility and consistency in the data gathered, an interview guide was designed with open-ended questions centered on key research themes. These included the perceived role and structure of pharmaceutical export accelerators, strategic challenges and operational requirements, and key factors that would influence the development of a localized business model. This guided flexibility allowed for depth while also enabling comparison across responses. Data from interviews were transcribed verbatim and prepared for analysis.

To ensure the validity and reliability of the qualitative findings, a rigorous multi-step coding and validation protocol was employed. The initial coding of interview transcripts was conducted independently by two researchers. Both coders reviewed the transcripts to extract meaningful codes and potential themes. Their findings were then compared to assess consistency and agreement. In cases of disagreement, discussions were held to reach consensus; if consensus was not achieved, a third expert acted as an adjudicator to resolve the discrepancy. This coder triangulation method significantly strengthened the reliability of the results. Moreover, reflexivity was incorporated throughout the analytic process. The researcher maintained a reflective journal, documented analytic decisions, and continually reviewed emerging themes against the raw data to ensure conceptual alignment.

The primary method of data analysis in this study was thematic analysis based on the six-phase inductive model proposed by Braun and Clarke (2006). This method was particularly well-suited to the exploratory nature of the research, as it allows for systematic identification, analysis, and interpretation of recurring patterns (themes) within qualitative data. The thematic analysis served both descriptive and interpretive purposes—organizing data and deriving insights that shaped the initial model of the specialized pharmaceutical export accelerator.

Thematic analysis began with the researcher's deep immersion in the data. All interview recordings were listened to multiple times, and detailed notes taken during interviews were closely reviewed. This familiarization step ensured the researcher was well-acquainted with the scope and subtleties of the content. In the second step, initial codes were systematically generated across the data set. These codes captured distinct, meaningful units of information relevant to the research questions.

In the third phase, codes were examined for patterns and grouped into potential themes. Some codes formed main themes, others became sub-themes, and those not fitting within coherent categories were set aside or categorized as miscellaneous. These provisional themes were then subjected to rigorous review in the fourth phase. This included cross-checking the coded extracts and evaluating whether the themes accurately reflected the broader data set. The fifth phase involved defining and naming themes to clearly articulate the essence of each, and to determine which aspects of the research problem they represented. Data within each theme were re-examined to ensure internal coherence and external distinction.

In the final phase, a comprehensive report was produced, synthesizing the findings with illustrative excerpts from the interviews. The narrative explained not only what each theme represented, but also how it related to others and contributed to the development of a context-specific business model for pharmaceutical export accelerators. Throughout all phases, the iterative nature of thematic analysis was honored, with continuous movement back and forth between raw data, codes, themes, and interpretations.

This multi-step, systematic qualitative approach allowed for a nuanced understanding of the local ecosystem of pharmaceutical exports and accelerators, ultimately leading to the construction of a grounded, practical business model tailored to local conditions.

3. Findings and Results

In the qualitative phase of the study, interviews were conducted with experts to gather insights on the development of a localized business model for a specialized pharmaceutical export accelerator. The sample size was determined using the snowball sampling method, in alignment with the nature of qualitative research and the principle of theoretical saturation. Ultimately, 13 experts from various professional domains were selected. These individuals were identified based on their relevant experience, academic qualifications, and professional roles in pharmaceutical trade, export consulting, academia, and regulatory institutions. The demographic details of these participants are summarized in the following table.

Table 1. Demographic Characteristics of Expert Participants

No.	Gender	Educational Level	Area of Expertise	Type of Affiliation	Work Experience (Years)
1	Female	PhD Candidate	Commerce	Academic Institution / Private Company	5
2	Male	PhD	Planning	Private Company	15
3	Male	General Doctorate	Trade Management	Non-private Syndicate / Private Company	25
4	Female	Master's Degree	Export	Private Company	12
5	Female	Master's Degree	Export	Export Service Company	13
6	Male	General Doctorate	Export	Export Service Company	4
7	Female	PhD	Assistant Professor	Academic Institution	15
8	Male	General Doctorate	Export	Private Company	3
9	Male	General Doctorate	Management	Private Company	12
10	Male	PhD	Full Professor	Academic Institution	40
11	Male	PhD	Export	Private Company	25
12	Male	Master's Degree	Commerce (Sales and Export)	Private Company	26
13	Male	Master's Degree	Export	Export Service Company	10

The data in Table 1 reflect a diverse group of expert participants, encompassing a range of academic qualifications from master's degrees to doctoral-level education. Their professional specializations span commerce, export, management, and strategic planning. The institutions they represent include private pharmaceutical companies, industrial syndicates, and top academic centers such as the Faculty of Pharmacy at Shahid Beheshti University of Medical Sciences and the Faculty of Entrepreneurship at the University of Tehran.

Work experience among the participants varies considerably, ranging from as little as 3 years to as much as 40 years, which illustrates the spectrum of expertise contributing to this study. The duration of interviews varied between 30 and 90 minutes, allowing for in-depth exploration of each expert's experiences and perspectives. This demographic diversity strengthened the study by enabling the model to be approached from multiple angles, thereby contributing to the comprehensiveness and practical relevance of the proposed framework for pharmaceutical export accelerators.

The process of qualitative data analysis using thematic analysis began with the researcher identifying meaningful expressions and propositions related to the research topic. This involved repeated reading and re-reading of the interview transcripts to extract statements that were both significant and relevant. These statements were then coded in a systematic manner. As thematic analysis is inherently iterative, the researcher frequently moved back and forth between the data and the emerging codes. At several points, it was necessary to revisit previous stages of the analysis to refine coding and enhance the conceptual clarity of the findings. This back-and-forth engagement ensured that the results were not only accurate but also grounded in the lived experiences and expert knowledge of the participants.

Table 2. Summary of Qualitative Findings (Thematic Analysis)

Expert No.	Initial Codes	Sub-Themes	Main Themes (Business Model Components)
2	Networking with governmental institutions	Strategic networking and partnerships	Key Partners (1)
4, 5	Interaction with key partners; Market entry		
3, 7, 9	Cooperation with core institutions and partners		
10	Supply chain management; Innovation	Innovation and process management	
12	Customer needs analysis; SWOT; Strategy	Strategic analysis and planning	Key Activities (2)
13	Initial evaluation; Qualification checklist		
1, 2, 6	Accelerator skills; Market needs research	Skills and operational processes	
8, 4, 5, 7	Export services; Value chain management	Services and value chain	
12, 2, 5, 7, 9	Strategic information; Human resources	Information and human capital	Key Resources (3)
3, 6	Financial and supportive networks		
10, 1, 2	Quality management; Market fit	Focus on quality and customer needs	Value Proposition (4)
9, 4, 7, 6	Export infrastructure services	Export services and infrastructure	
11, 8, 7, 2	Pricing strategy; Branding; Market research	Export marketing and innovation	
12, 1, 7, 6	Continuous interaction; Commitment	Sustainable and trusted relationships	Customer Relationships (5)
7, 1, 13	Cultural management; Targeted engagement	Cultural and organizational engagement	
4, 5, 9	Legal registration; Trusted intermediaries	Supportive legal frameworks	
9, 13, 8	Marketing channels; Distribution strategies	Sales and marketing channels	Distribution Channels (6)
10, 4, 2	International and digital networking	Communication and digital infrastructure	
11, 1, 3, 5	Local representatives; Cultural adaptation	Market condition adaptation	Customer Segments (7)
7, 6, 13	Target definition; Prioritization		
10, 3, 2	Special needs response; Flexibility	Customer-centric and adaptive services	
11, 6	Legal/export barriers	Infrastructure and regulatory challenges	
4, 1, 9	Key customer identification	Customer targeting and specialization	
11, 10, 9	Cost control; Operational expenses	Cost structure and optimization	Cost Structure (8)
4, 6, 5	Foreign operation costs		
1	Sanctions and currency fluctuations	International financial challenges	
12, 9, 4	Cash flow; Revenue model flexibility	Revenue stream management	Revenue Streams (9)
10, 12, 2	Investment scalability; Financial challenges	Investment and financing	
3, 6, 7, 5	Revenue diversification	Service monetization	

The results of the qualitative analysis, presented in Table 2, reveal a rich thematic structure underlying the formation of a localized business model for specialized pharmaceutical export accelerators. Through thematic analysis of expert interviews, nine core components of a business model were identified in alignment with the Business Model Canvas framework: key partners, key activities, key resources, value proposition, customer relationships, distribution channels, customer segments, cost structure, and revenue streams. Each component was derived from a set of meaningful initial codes articulated by the participants and then grouped into sub-themes through a rigorous, multi-stage inductive process. For example, the theme of *Key Partners* emerged from discussions on strategic networking and collaboration with governmental and private stakeholders, while *Key Activities* involved planning, market analysis, and operational competencies. *Key Resources* encapsulated both tangible and intangible assets such as expert knowledge, financial capacity, and strategic data. The *Value Proposition* reflected quality assurance, customer fit, and tailored services. In parallel, components like *Customer Relationships* and *Distribution Channels* emphasized trust-building, cultural adaptability, and multichannel engagement. The *Customer Segments* theme highlighted market prioritization and service customization. Financial dimensions, including *Cost Structure* and *Revenue Streams*, captured insights on cost efficiency, scalability, and monetization models. The diversity and consistency of expert contributions ensured that each theme was well-founded, contextually grounded, and aligned with the structural and strategic needs of pharmaceutical export accelerators in Iran.

<table>
<tr>
<td rowspan="2">Key Partners
Strategic networking and partnerships
Collaboration with institutions and key stakeholders</td>
<td>Key Activities
Strategic analysis and planning
Skills and operational processes
Services and value chain</td>
<td rowspan="2">Value Proposition
Focus on quality and customer needs
Export services and infrastructure
Export marketing and innovation</td>
<td>Customer Relationships
Sustainable and trusted relationships
Cultural and organizational engagement
Supportive legal frameworks</td>
<td rowspan="2">Customer Segments
Market condition adaptation
Customer targeting and specialization
Customer-centric and adaptive services</td>
</tr>
<tr>
<td>Key Resources
Information and human capital
Financial and supportive networks</td>
<td>Distribution Channels
Sales and marketing channels
Communication and digital infrastructure</td>
</tr>
<tr>
<td colspan="3">Cost Structure
Cost structure and optimization
Operational and infrastructure expenses
International financial challenges</td>
<td colspan="2">Revenue Streams
Revenue stream management
Investment and financing
Service monetization</td>
</tr>
</table>

Figure 1. Final Conceptual Model

4. Discussion and Conclusion

The present study aimed to design a localized business model for a specialized pharmaceutical export accelerator in Iran through a qualitative, expert-informed process. The findings led to the identification of nine main components aligned with the Business Model Canvas framework: key partners, key activities, key resources, value proposition, customer relationships, distribution channels, customer segments, cost structure, and revenue streams. These components were extracted through thematic analysis of 13 expert interviews, each providing insight into the structure, function, and operational demands of a pharmaceutical export accelerator. The resulting model captures the contextual complexity of the Iranian pharmaceutical export ecosystem and offers a pragmatic roadmap for targeted policy intervention and entrepreneurial development.

One of the most emphasized themes was Key Partners, which included sub-themes such as strategic networking, collaboration with public institutions, and integration with syndicates and private sector actors. Experts stressed the importance of forming coalitions with regulatory bodies, export service firms, academic institutions, and financial entities to create an enabling ecosystem for export acceleration. This aligns with international experiences where export growth has been facilitated through inter-institutional collaboration. For instance, India's pharmaceutical success is attributed in part to its public-private partnerships and proactive export councils [1, 7]. Likewise, effective partnering with policy and regulatory bodies in Russia has been shown to enhance export performance [4].

In terms of Key Activities, strategic planning, customer analysis, and operational process design were considered central. Interviewees repeatedly highlighted the need for accelerators to engage in SWOT analysis, competitive intelligence, and market segmentation to prepare firms for international expansion. These findings are consistent with prior research that emphasized strategic foresight as a critical capability in export-oriented pharmaceutical enterprises [8, 17]. Similar strategies have been recommended for pharmaceutical exporters in Thailand and Jordan, where aligning firm-level strategic planning with export objectives significantly enhanced organizational performance [18, 19].

Key Resources such as skilled human capital, regulatory knowledge, strategic data, and access to financial support emerged as crucial enablers. Many participants pointed to the deficiency of export-specific human resources and the lack of integrated data systems in Iran's pharmaceutical sector. This corroborates earlier studies that identified the scarcity of export-trained personnel and limited institutional memory as major barriers in Iranian pharmaceutical exports [2, 9]. Globally, successful pharmaceutical exporters have invested in export capability building, market intelligence, and regulatory certification infrastructure to ensure competitiveness [6, 12].

The Value Proposition component included themes of quality assurance, customization to market needs, and integrated service delivery. Experts emphasized that Iranian pharmaceutical exporters need to shift from volume-based strategies to value-driven models that focus on customer-specific requirements and compliance with international standards. This aligns with findings from studies in Russia and the EU where emphasis on therapeutic efficacy, bioequivalence, and GMP compliance significantly enhanced exportability [3, 21, 25]. Additionally, in the context of high competition and price sensitivity, differentiation through quality and regulatory reliability has become a cornerstone for export success [20, 24].

The theme of Customer Relationships revealed that sustained, trust-based engagement is essential for long-term export partnerships. Several experts underscored the cultural and communicative dimensions of relationship building in international markets, especially for Iranian firms entering new regulatory jurisdictions. This echoes insights from Qureshi et al. (2025), who analyzed relational strategies in emerging market pharmaceutical firms and concluded that trust, transparency, and consistency were key to retaining foreign clients [27]. Furthermore,

customer trust was often closely linked to reliability in delivery, responsiveness to feedback, and clear post-sale support.

Distribution Channels were another focus area, where experts identified a combination of traditional (in-person representatives) and modern (digital platforms) strategies. Participants noted the increasing importance of omnichannel engagement, leveraging both online presence and physical networks for international outreach. These views are supported by studies that emphasize hybrid channel strategies in pharmaceutical export marketing [14, 22]. In particular, local representation, such as distributors or regulatory consultants in target markets, was viewed as a critical asset for compliance and market penetration [16].

The Customer Segments component reflected a nuanced understanding of target markets, with sub-themes like cultural adaptation, need segmentation, and flexible service packages. Experts highlighted the importance of tailoring offerings based on the regulatory environment, purchasing power, and therapeutic demand of destination markets. These findings resonate with global strategies in market prioritization, especially in countries navigating fragmented or evolving health systems [12, 13]. For Iranian exporters, this suggests the need to strategically focus on accessible markets with compatible regulatory standards, such as neighboring countries or lower-middle-income nations with high pharmaceutical import dependency.

Cost Structure emerged as a critical consideration, particularly given the economic volatility and international sanctions faced by Iran. Experts reported a wide array of cost-related challenges including foreign transaction fees, regulatory certification expenses, and marketing infrastructure. These insights are consistent with earlier studies that pointed to the operational cost burden as a deterrent for SME participation in pharmaceutical exports [9, 10]. In contrast, large firms in countries like India and China have adopted cost optimization strategies including centralized procurement, tax reliefs, and digital process automation to maintain export margins [6, 15].

Finally, Revenue Streams were described as complex and evolving. Participants highlighted pricing flexibility, diversified income models, and strategic reinvestment as essential for sustainability. Many experts emphasized the challenge of managing financial flow due to restrictions on international banking and currency volatility. These challenges mirror those observed in other export-dependent industries in sanctioned or high-risk markets [23, 26]. Despite these barriers, innovative revenue strategies—such as licensing, joint ventures, and value-added services—are increasingly adopted to stabilize income and improve scalability [7, 11].

In sum, the findings demonstrate that designing a business model for pharmaceutical export accelerators requires integrating local strengths with global standards. The multidimensional themes—ranging from partnerships and planning to market engagement and monetization—reflect a comprehensive and context-aware model. The proposed structure not only accommodates Iran's unique regulatory, financial, and institutional environment but also positions the accelerator to support pharmaceutical firms in navigating global competition and regulatory demands.

While the study offers valuable insights into designing a business model for pharmaceutical export accelerators, certain limitations should be acknowledged. First, the qualitative methodology, while suitable for exploratory research, inherently limits generalizability. The sample size of 13 experts, although determined based on theoretical saturation, may not capture the full diversity of perspectives within the pharmaceutical export ecosystem. Moreover, the study is context-specific to Iran and may not directly apply to countries with differing regulatory or economic environments. Finally, data were collected at a specific point in time, which may not fully account for dynamic policy shifts or emergent global disruptions such as post-pandemic regulatory trends.

Future studies should aim to validate the proposed business model quantitatively, using larger sample sizes and cross-sectoral surveys. Comparative research across multiple countries with similar economic or regulatory contexts could enhance external validity and identify region-specific enablers or inhibitors of export acceleration. Additionally, longitudinal studies could track the implementation of accelerator models over time to assess outcomes such as firm internationalization rate, revenue growth, and regulatory compliance. Exploring the digital transformation of export acceleration, including AI-driven analytics and virtual mentoring, also presents a promising avenue for future inquiry.

Practitioners seeking to establish or refine pharmaceutical export accelerators should prioritize strategic alignment with public institutions, particularly regulatory bodies and trade ministries. Capacity building in areas such as international compliance, market intelligence, and digital engagement should form the backbone of accelerator services. Furthermore, designing flexible, modular service packages that can adapt to the needs of different target markets will be critical. Cost management and revenue diversification strategies must be embedded from the outset to ensure financial resilience. Lastly, creating a robust performance evaluation system will allow accelerators to continually improve and demonstrate value to stakeholders.

Authors' Contributions

Authors equally contributed to this article.

Ethical Considerations

All procedures performed in this study were under the ethical standards.

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Conflict of Interest

The authors report no conflict of interest.

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