

Designing a Model for the Development of Entrepreneurial Marketing of Petrochemical Products with an Emphasis on International Markets

Farhad Heydari¹, Nematollah Shiri², Mohammad Aidi^{3,*}, Tohfeh Ghobadi lamouki⁴ and Nasrin Karamikabir⁵



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- ¹ PhD Student, Department of Business Administration, Hamedan Branch, Islamic Azad University, Hamedan, Iran; 
- ² Assistant Professor, Department of Entrepreneurship and Rural Development, Ilam University, Ilam, Iran; 
- ³ Assistant Professor, Department of Business Administration, Ilam University, Ilam, Iran; 
- ⁴ Associate Professor, Department of Business Management, Hamedan Branch, Islamic Azad University, Hamedan, Iran; 
- ⁵ Assistant Professor, Mathematics Department, Hamedan Branch, Islamic Azad University, Hamedan, Iran; 

* Correspondence: M.aidi@ilam.ac.ir

Abstract: The present study was conducted with the aim of designing a model for the development of entrepreneurial marketing of petrochemical products with an emphasis on international markets. In terms of purpose, the research is fundamental and developmental, and based on the nature of the data, it is qualitative. The research design follows a qualitative approach. The statistical population of the study included university professors, experts and elites in the field of marketing, as well as employees and managers of the Arak Petrochemical Company. Data analysis was carried out using grounded theory methodology. The findings indicated that among qualitative research strategies, grounded theory was employed, leading to the development of a comprehensive model encompassing causal factors, intervening factors, contextual factors, strategies, and the overall design of a model for the development of entrepreneurial marketing of petrochemical products with an emphasis on international markets. Based on the results obtained, a total of 159 concepts and 22 categories or open codes were identified and extracted. The 22 identified categories were classified into six main grounded theory dimensions. According to the findings, a model for the development of entrepreneurial marketing of petrochemical products with an emphasis on international markets was proposed. The results further indicate that success in developing entrepreneurial marketing of petrochemical products in international markets requires a comprehensive strategy, commitment to that strategy, and flexibility in response to market changes.

Keywords: entrepreneurial marketing; petrochemical products; international markets

1. Introduction

In recent decades, the global business environment has undergone profound structural and technological transformations that have fundamentally altered the nature of competition, value creation, and market engagement. Intensified globalization, accelerated technological diffusion, and heightened uncertainty have compelled firms—particularly those operating in dynamic and capital-intensive industries—to rethink traditional marketing paradigms and adopt more adaptive, opportunity-driven approaches. Within this evolving landscape, entrepreneurial marketing has emerged as a critical integrative construct that bridges

entrepreneurship and marketing by emphasizing innovation, proactiveness, customer intimacy, and strategic flexibility in the pursuit of sustainable growth [1-3]. Unlike conventional marketing models that rely heavily on structured planning and resource abundance, entrepreneurial marketing prioritizes experimentation, learning, and market creation under conditions of uncertainty and constraint [4, 5].

Entrepreneurial marketing has been conceptualized as both a mindset and a set of strategic behaviors through which firms identify, create, and exploit market opportunities in novel ways. Scholars emphasize that entrepreneurial marketing integrates opportunity recognition, innovative value propositions, customer co-creation, and resource leveraging into a coherent strategic orientation [6, 7]. This perspective is particularly salient for industries facing volatile demand, technological disruption, and international competitive pressures, where rigid marketing frameworks often fail to capture emergent opportunities [8, 9]. Consequently, entrepreneurial marketing has gained increasing scholarly attention as a driver of firm performance, resilience, and competitive advantage across diverse contexts.

One of the sectors in which the relevance of entrepreneurial marketing is especially pronounced is the petrochemical industry. As a cornerstone of industrial development and a key contributor to export revenues, employment generation, and technological advancement, the petrochemical sector plays a strategic role in national and regional economies [10, 11]. However, petrochemical firms increasingly operate in a highly complex international environment characterized by price volatility, geopolitical risks, environmental regulations, digital transformation, and shifting customer expectations. These conditions necessitate marketing approaches that go beyond cost efficiency and transactional exchange toward innovation-driven, customer-centric, and globally responsive strategies.

International markets impose additional layers of complexity on marketing activities, particularly for firms originating from emerging economies. Differences in institutional frameworks, cultural norms, technological infrastructure, and competitive intensity require firms to develop advanced market knowledge, adaptive capabilities, and strategic agility [12, 13]. Research indicates that international performance is strongly influenced by firms' ability to align entrepreneurial orientation with marketing strategy, enabling them to respond effectively to diverse market conditions and exploit cross-border opportunities [11, 14]. In this regard, entrepreneurial marketing offers a robust framework for managing uncertainty and complexity in international business environments.

Theoretical developments in entrepreneurial marketing highlight its multidimensional nature, encompassing dimensions such as opportunity focus, innovation intensity, customer orientation, risk management, and value creation logic [15, 16]. These dimensions are not merely tactical tools but reflect deeper organizational capabilities and cultural orientations that shape how firms perceive and engage with markets. Ethical considerations, learning orientation, and value-based decision-making have also been incorporated into contemporary models of entrepreneurial marketing, underscoring its normative and strategic depth [17, 18].

The rapid diffusion of digital technologies has further expanded the scope and impact of entrepreneurial marketing. Digital platforms, social media, data analytics, artificial intelligence, and Internet of Things (IoT) applications have transformed how firms interact with customers, design value propositions, and enter international markets [19, 20]. Digital entrepreneurial marketing enables firms to reduce information asymmetries, personalize offerings, and scale rapidly across borders, thereby enhancing competitiveness even in resource-constrained settings [21, 22]. For petrochemical firms, which traditionally rely on industrial buyers and long-term

contracts, digitalization presents new opportunities for relationship management, market intelligence, and strategic differentiation.

Empirical studies consistently demonstrate that entrepreneurial marketing positively influences firm outcomes such as growth, export performance, innovation capability, and financial resilience. In small and medium-sized enterprises, entrepreneurial marketing has been shown to support high-growth trajectories and employment generation, particularly under turbulent economic conditions [10, 23]. More recent research highlights the role of marketing agility and resilience capabilities in sustaining performance during crises, emphasizing the adaptive strengths inherent in entrepreneurial marketing approaches [24, 25]. These findings are increasingly relevant for capital-intensive industries exposed to global shocks and regulatory uncertainty.

Despite the growing body of literature, several critical gaps remain. First, much of the existing research on entrepreneurial marketing has focused on small firms, startups, tourism, and technology-based ventures, with relatively limited attention to heavy industries such as petrochemicals. While studies have examined entrepreneurial marketing in export contexts and international new ventures, they often lack industry-specific models that account for structural constraints, regulatory environments, and technological complexity [13, 26]. This limitation restricts the applicability of existing frameworks to sectors where strategic decisions are shaped by long investment cycles and geopolitical considerations.

Second, prior studies frequently adopt quantitative approaches that test predefined constructs, thereby offering limited insight into the underlying processes and contextual mechanisms through which entrepreneurial marketing unfolds in complex industrial settings. Qualitative and theory-building research is needed to capture the nuanced interactions between market dynamics, organizational capabilities, institutional conditions, and strategic choices [2, 3]. Grounded and context-sensitive models are particularly valuable for understanding how firms in emerging economies design and implement entrepreneurial marketing strategies in international markets.

Third, the integration of entrepreneurial marketing with international market development in the petrochemical industry remains underexplored, especially in contexts affected by sanctions, regulatory barriers, and constrained access to global networks. Studies indicate that government support, policy stability, entrepreneurial culture, and institutional infrastructure significantly influence firms' ability to internationalize and compete effectively [27, 28]. However, these factors are rarely incorporated into comprehensive entrepreneurial marketing models tailored to the petrochemical sector.

Recent research has begun to address related issues by examining network-based entrepreneurial marketing, strategic collaboration, and ecosystem development as pathways to international growth [29, 30]. These studies suggest that relational capabilities, cross-sector partnerships, and innovation networks can compensate for resource limitations and enhance international market access. Nevertheless, a systematic and integrative model that synthesizes these elements within the specific context of petrochemical products is still lacking.

Furthermore, cultural and cognitive dimensions play a crucial role in shaping entrepreneurial marketing behavior. Entrepreneurial mindset, learning orientation, and value systems influence how managers perceive risk, interpret market signals, and engage with international customers [15, 21]. Ethnographic and qualitative studies highlight the importance of local knowledge, ethical considerations, and social capital in entrepreneurial marketing practices, particularly in non-Western contexts [16, 31]. Incorporating these dimensions into model development can enhance explanatory power and contextual relevance.

Taken together, the literature underscores the strategic importance of entrepreneurial marketing for firms operating in complex and internationalized environments, while also revealing the absence of a comprehensive,

empirically grounded model for the development of entrepreneurial marketing in the petrochemical industry with an explicit focus on international markets. Addressing this gap requires an integrative approach that captures causal conditions, contextual factors, strategic mechanisms, and performance outcomes within a coherent theoretical framework.

Accordingly, the aim of this study is to design a comprehensive model for the development of entrepreneurial marketing of petrochemical products with an emphasis on international markets.

2. Methodology

This study was conducted using a qualitative approach and employing the grounded theory strategy in the exploratory phase, with the aim of identifying the dimensions and components related to the development of entrepreneurial marketing of petrochemical products in international markets and extracting an initial conceptual model. The study population consisted of managers and deputy managers of Arak Petrochemical Company, faculty members specializing in marketing, and researchers familiar with the subject matter. Sampling was carried out through purposive and snowball techniques, and data collection continued until theoretical saturation was achieved. The primary data collection instrument was unstructured in-depth interviews, which were fully recorded, transcribed, and immediately analyzed. Data analysis was conducted based on the stages of open, axial, and selective coding within the grounded theory framework. Through line-by-line examination of the data, initial concepts were extracted, categories were organized, and ultimately a coherent theoretical model was developed. To enhance the credibility of the study, methods such as member checking, expert evaluation, constant comparison of data, and triangulation were employed. In addition, the researchers ensured the trustworthiness of the findings by clarifying the implementation stages, documenting the analysis process, and maintaining consistency between data collection and interpretation phases. The model derived from this stage served as the basis for designing the measurement instrument and formulating analytical pathways in the subsequent stages of the research.

3. Findings and Results

In open coding, the data obtained from the interviews were first carefully reviewed, examined, and analyzed. Subsequently, the process of conceptualization was carried out, and data that were conceptually similar were labeled with appropriate codes. The following section presents an examination of the interviews and the extracted statements along with the concepts assigned to them. Table 1 illustrates samples of interview excerpts and some of the extracted codes.

Table 1. Sample Interview Excerpts and Selected Extracted Codes

Interview Excerpt	Code
Acting as a primary hub for transformations in the petrochemical industry and entrepreneurial marketing. A combination of advanced technologies and entrepreneurship-based marketing strategies can contribute to the production and development of new petrochemical products.	Technology-based business grounded in entrepreneurial marketing in the petrochemical industry
Establishing science and technology parks in the petrochemical industry can support research and development of innovative products. These parks can serve as centers of entrepreneurial initiatives managed by technology-driven entrepreneurs in petrochemical marketing.	Science and technology parks in the industry
Utilizing accelerators and startup ecosystems can facilitate interactions among small and emerging businesses in petrochemical marketing and enable more rapid growth.	Attention to accelerators in promoting and developing entrepreneurial marketing in the petrochemical industry

The knowledge of specialized individuals in the petrochemical field provides opportunities to apply technical and professional expertise in the development and improvement of products.	Utilization of technical knowledge
Establishing startups with an entrepreneurial orientation can lead to innovation and transformation in the marketing of petrochemical products.	Establishment of technology-based startups in entrepreneurial marketing of the petrochemical industry
The use of artificial intelligence in data analysis, market behavior prediction, optimization of marketing processes, and enhancement of the effectiveness of marketing strategies can contribute to the development of entrepreneurial marketing.	Attention to artificial intelligence
Information security is critically important in the petrochemical industry. Creating innovation infrastructures in this area can enhance market trust and protect critical customer information.	Innovation infrastructures in the field of information security

In total, 107 concepts or open codes were identified and extracted, which are presented as initial codes in Table 2. In the next step, those extracted concepts that, in the researcher's view, referred to a common theme or concept were grouped under a more abstract label and categorized as categories. A total of 159 initial codes were classified into 22 categorical groups.

Table 2. Identification of Categories Related to Open Codes

Core Category	Open Code
Market and Competitor Analysis	Market needs assessment
Examination of demand conditions and competitors' positions in international markets	
Attention to market analysis	
Identification of existing opportunities for petrochemical products	
Information Technology Infrastructure	High-speed internet
Appropriate digital tools and software	
Appropriate hardware	
Appropriate technologies based on marketing procedures	
Entrepreneurial Capabilities	Acceptance of innovation and creativity
Risk-taking propensity	
Perceived risk	
Perseverance in the entrepreneurial process	
Idea generation	
Communication and Networking	Effective communication with customers
Communication with competitors and partners	
Identification of collaboration opportunities with diverse actors	
Modern communication tools	
Ability to respond quickly and accurately	
Continuous communication with customers	
Ability to follow up and track problems	
Monitoring the status of requests	
International Market and Cultural Knowledge	Familiarity with international markets
Identification of global market trends	
Security	Protection of customer information
Encryption of personal data	
Common security standards and methods	
Detection and prevention of cyberattacks and intrusions	
Continuous monitoring of information systems	
Protection of customer privacy	
Identity verification (two-factor authentication)	
Protection of overall petrochemical industry information	
Accessibility	Omnichannel structure in petrochemical industry marketing

Geographic distance (proximity and remoteness) for optimizing entrepreneurial marketing	
Perceived ease of access	
Information dissemination based on regional characteristics	
Categorization of marketing channels	
Efficiency of Marketing Methods	Marketing self-efficacy
Quality of marketing techniques	
Transparency of marketing information	
Open data policies	
Online and offline channel strategies	
Policymaking based on empirical and experimental data	
Customer Characteristics	Demographic characteristics
Behavioral characteristics	
Income level	
Cognitive patterns in technology adoption	
Country and place of residence	
Family size	
Customer social status	
Digital Enablement	Provision of required software and hardware
Electronic customer relationship management	
Benchmarking successful global models	
Enhancing organizational knowledge in multichannel marketing	
Provision of organizational resources	
Establishment of a marketing advisory team	
Definition of digital process protocols	
Political Conditions and National Regulations	Status of national regulations
Status of implementation of international laws	
Banking requirements and regulatory enforcement for the petrochemical industry	
Limited participation of Iran in international trade	
Political and economic sanctions	
National Entrepreneurial Structure	National entrepreneurial outlook
Creation of new entrepreneurial platforms in the fintech domain	
Access to physical communication infrastructure	
Access to ICT infrastructure	
Access to skilled and semi-skilled labor	
Entrepreneurial fields within the country	
Government Support	Availability of opportunities for entrepreneurial development in the petrochemical industry
Existence of governmental support services for petrochemical entrepreneurship	
Financial and non-financial support for entrepreneurial and innovative centers in the petrochemical industry	
Allocation of sufficient funding to research institutions	
Policymaking	Strong understanding of entrepreneurial marketing needs and priorities in the petrochemical sector
Adequate attention to entrepreneurship and marketing in national macro-policies	
Adoption of appropriate and operational governmental programs to realize formulated general policies	
Availability of adequate insurance and welfare coverage	
Stability in government policies	
Avoidance of discretionary and ad hoc policies	
Existence of an appropriate roadmap and systematic governmental thinking for petrochemical entrepreneurship	

Equating entrepreneurship with job creation in policies and decision-making	
Existence of a comprehensive national entrepreneurship development program	
Managerial support for innovation and creativity based on entrepreneurial marketing	
Enforcement of promotion regulations for faculty members specialized in entrepreneurial marketing	
Experienced and innovative management systems and managers	
Managerial support for intellectual property in entrepreneurial marketing and optimal commercialization of inventions	
Stability of public-sector managers and employers	
Innovation and Creativity	Provision of modern and up-to-date software and hardware
Compliance with international regulations	
Establishment of organizational information and knowledge bases	
Provision of financial and organizational resources for digital innovation and creativity	
Formation of advisory and specialized digital teams in entrepreneurial marketing	
Definition of entrepreneurial marketing process protocols	
Culture Building	Attention to cultural similarities between entrepreneurial marketing and petrochemical industry disciplines
Similar motivations in entrepreneurial marketing and the petrochemical industry	
Scientific and research articles and journals in entrepreneurial marketing	
Promotion of research culture and inspirational environments in entrepreneurial marketing	
Creating motivational foundations for entrepreneurial marketing among students	
Preference for self-employment and expansion of self-employment culture among industry-related students	
Media, social norms, and success stories of entrepreneurial marketing	
Organization of scientific conferences, seminars, and symposiums	
Existence of a supportive culture for entrepreneurial marketing in universities	
Mutual trust between universities and industry in developing entrepreneurial marketing	
Education	Avoidance of traditional and non-applied education
Training of new skills and professions based on entrepreneurial marketing in universities	
Alignment of entrepreneurial marketing curricula with industry market needs	
Existence of problem-oriented courses and projects in petrochemical entrepreneurial marketing	
Attention to fostering creativity and innovation among petrochemical students	
Availability of appropriate counseling services	
Adequate attention to internships and apprenticeships	
Technology Development and Transfer	Technology-based business grounded in entrepreneurial marketing in the petrochemical industry
Science and technology parks in the industry	
Attention to accelerators in promoting and developing entrepreneurial marketing in the petrochemical industry	
Utilization of technical knowledge	
Establishment of technology-based startups in petrochemical entrepreneurial marketing	

Attention to artificial intelligence	
Innovation infrastructures in information security	
Attention to blockchain and cryptocurrencies	
Technological products	
Technology-oriented universities for developing entrepreneurial marketing in the petrochemical industry	
Technological value networks	
Knowledge based on entrepreneurial marketing in the petrochemical industry	
Transfer and commercialization of fintech entrepreneurship in the petrochemical industry	
Customer Orientation	Retention of existing customers
Expansion of customer base	
Acquisition of new customers	
Building customer trust	
Creation of word-of-mouth marketing among customers	
Enhancement of customer loyalty	
Profitability	Reduction of operational costs
Reduction of personnel and physical space costs	
Inimitable competitive advantage	
Digitalization of the petrochemical industry	
Increase in revenue and financial profitability	
Development of the digital economy infrastructure	
Creation of a positive competitive environment in the petrochemical industry	
Smartization and alignment with global trends	
Customer orientation based on international standards	
Growth of the digital petrochemical industry	
Improvement of digital trade conditions	
Empowerment of human resources	
International standardization	
Opportunities of the international petrochemical industry model	
Value Creation	Creation of sustainable and added value
Job creation	
Reduction of unemployment	
Achievement of domestic service objectives	
Economic growth	
Culture building for entrepreneurial marketing and creative development	
Increased effectiveness of strategic programs	
Improved effectiveness of laws and regulations	
Competition through technology, industry, and knowledge	
Modernization of organizational knowledge structures	
Continuous improvement of organizational smartization	
Enhancement of competitive potential	
Creation of sustainable competitive advantage	
International Position	Alignment with global changes
Expansion of international communications	
Smart economy strategies	
Improvement of entrepreneurship benchmarking and localization in the country	
Development of an international competitive environment	

The purpose of this stage (axial coding) is to establish relationships among the categories generated during the open coding stage. This coding is referred to as axial because it is organized around the axis of a central research category, namely “designing a model for the development of entrepreneurial marketing of petrochemical products with an emphasis on international markets.” This category was selected as the core category and placed at the center of the model, as its trace and influence can be clearly observed in most of the data and interviewees’ quotations. Therefore, this category can be positioned at the core of the model, and other categories can be related to it. For axial coding in this study, the paradigmatic model of Strauss and Corbin was employed.

Core Category: Development of Entrepreneurial Marketing of Petrochemical Products with an Emphasis on International Markets

In this study, the category “a model for the development of entrepreneurial marketing of petrochemical products with an emphasis on international markets” was selected as the core category. As noted, the presence of this category is observable throughout the data, and it was referenced in almost all interviews, playing a central role. More precisely, other categories are organized around this central orientation. Interviewees, in various quotations and narratives, referred to concepts such as profitability, customer interaction, marketing strategy, and other related issues.

Causal Conditions

In this study, five categories—market and competitor analysis, information technology infrastructure, entrepreneurial capabilities, communication and networking, and international market and cultural knowledge—were considered as causal conditions.

Contextual Conditions

In this study, the categories of digital enablement, political conditions and national regulations, the national entrepreneurial structure, and government support were considered as contextual conditions.

Intervening Conditions

In this study, security, accessibility, efficiency of marketing methods, and customer characteristics were identified as intervening conditions.

Strategies

This category includes the strategies of policymaking, innovation and creativity, culture building, education, and technology development and transfer.

Consequences

In this study, the consequences resulting from the research strategies were classified into four categories: customer orientation, profitability, value creation, and international position. In the following sections, each of these consequences will be described and explained.

As stated, selective coding is the main stage of theory development, in which the core category is systematically linked to other categories, these relationships are clarified within the framework of a narrative or storyline, and categories that require further refinement and development are revised. In other words, selective coding is the process of integrating, refining, and purifying categories, such that the researcher creates a specific coherence and arrangement among categories to organize them for presenting and shaping a theory, which is made possible through the identification of the core category. The core category summarizes the results of the analytical experience in the form of a short phrase composed of a few words. In this study, the core category was titled “designing a model for the development of entrepreneurial marketing of petrochemical products with an emphasis on international markets,” because a large proportion of the interviewees’ quotations focused on the components they

considered important for enhancing attractiveness and the manner of developing them, which is clarified through the selection of this title for the core category. Subsequently, based on the concepts and categories extracted from the previous stages, a narrative explaining how programs are applied to enhance the design of a model for the development of entrepreneurial marketing of petrochemical products with an emphasis on international markets is presented.

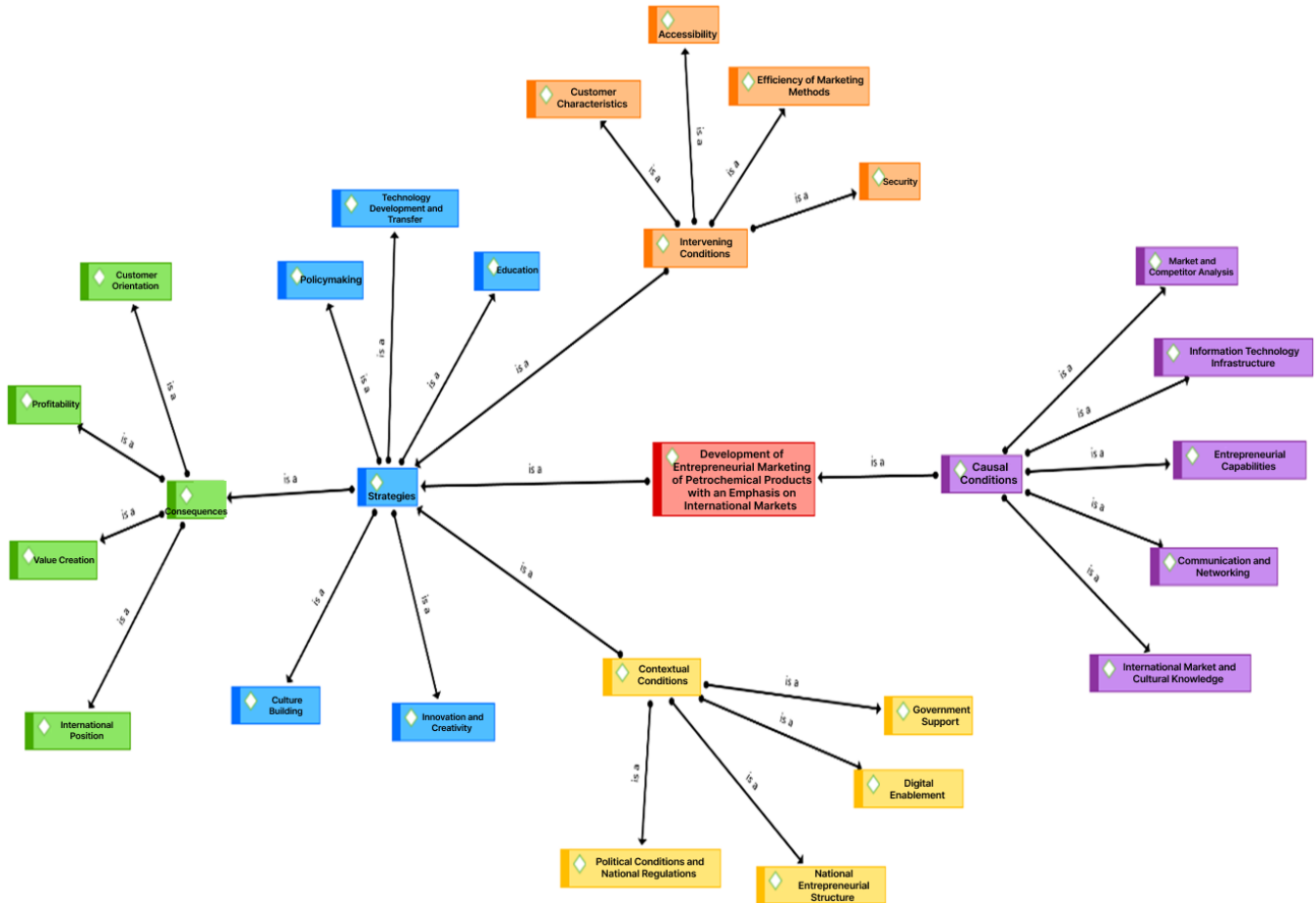


Figure 1. Components of the Grounded Theory Model Based on the Strauss and Corbin Paradigm

4. Discussion and Conclusion

The findings of the present study provide a coherent and context-sensitive explanation of how entrepreneurial marketing of petrochemical products can be developed with an emphasis on international markets. The grounded theory model revealed that entrepreneurial marketing in this sector is not a linear or purely tactical activity, but rather a multidimensional and dynamic process shaped by causal conditions, contextual and intervening factors, strategic responses, and diverse outcomes. At the core of the model lies the development of entrepreneurial marketing as an integrative capability that aligns opportunity recognition, innovation, customer orientation, and strategic flexibility with the specific structural and institutional characteristics of the petrochemical industry. This result reinforces the conceptual position that entrepreneurial marketing functions as a bridging construct between entrepreneurship and marketing, particularly in environments characterized by uncertainty and global competition [1-3].

One of the central results of the study is the identification of market and competitor analysis, information technology infrastructure, entrepreneurial capabilities, communication and networking, and international market and cultural knowledge as key causal conditions shaping entrepreneurial marketing development. This finding aligns with prior research emphasizing that entrepreneurial marketing is grounded in deep market insight, proactive opportunity identification, and the ability to interpret competitive dynamics across borders [4, 5]. The emphasis on international market knowledge and cultural awareness supports earlier studies showing that firms operating in global markets must go beyond standardized marketing approaches and develop adaptive, learning-oriented strategies to cope with institutional and cultural diversity [12, 13]. In the petrochemical context, where buyer relationships are often long-term and complex, such knowledge becomes a critical enabler of entrepreneurial behavior rather than a supplementary resource.

The results further demonstrate the foundational role of information technology infrastructure in facilitating entrepreneurial marketing. Digital tools, high-speed connectivity, and data-driven systems emerged as essential prerequisites for effective market sensing, customer interaction, and strategic responsiveness. This finding is consistent with contemporary literature highlighting the transformative impact of digitalization on entrepreneurial marketing practices, particularly in terms of agility, scalability, and real-time decision-making [8, 19]. The integration of digital infrastructure into the entrepreneurial marketing model reflects the growing recognition that even traditional and capital-intensive industries such as petrochemicals are increasingly shaped by digital capabilities that enhance competitiveness in international markets [20, 21].

Entrepreneurial capabilities, including innovation acceptance, risk perception, perseverance, and idea generation, were identified as another core causal condition. This result supports the theoretical argument that entrepreneurial marketing is deeply rooted in managerial cognition and organizational mindset rather than solely in formal strategies or structures [6, 7]. The findings echo prior studies indicating that firms with stronger entrepreneurial orientations are better equipped to pursue novel market opportunities, manage uncertainty, and reconfigure resources in response to environmental changes [9, 14]. In the petrochemical industry, where innovation cycles are often constrained by regulation and capital intensity, entrepreneurial capabilities appear to function as a critical lever for marketing differentiation and international expansion.

The study also highlights the importance of contextual conditions, particularly digital enablement, political and regulatory environments, national entrepreneurial structure, and government support. These findings underscore that entrepreneurial marketing development does not occur in isolation but is embedded within broader institutional and policy frameworks. Consistent with earlier research, the results indicate that supportive regulations, access to infrastructure, and stable policy environments significantly influence firms' ability to adopt entrepreneurial marketing strategies and compete internationally [27, 28]. The prominence of government support and national entrepreneurial structure in the model aligns with studies emphasizing the role of institutional support mechanisms in facilitating export-oriented entrepreneurship and marketing innovation, especially in emerging economies [10, 11].

Intervening conditions such as security, accessibility, efficiency of marketing methods, and customer characteristics further explain how entrepreneurial marketing strategies are enabled or constrained in practice. The strong emphasis on information security and data protection reflects the growing sensitivity of international markets to trust, compliance, and risk management. This result is in line with recent literature highlighting that customer trust and data security have become integral components of value creation in digital and international marketing contexts [19, 22]. Similarly, the role of accessibility and omnichannel structures supports the argument

that entrepreneurial marketing increasingly relies on seamless and flexible market access pathways that enhance customer experience and responsiveness [25, 29].

The strategic dimension of the model reveals that entrepreneurial marketing development in the petrochemical industry is driven by a combination of policymaking, innovation and creativity, culture building, education, and technology development and transfer. This multifaceted strategic response confirms the view that entrepreneurial marketing is not limited to promotional tactics but involves systemic changes in organizational culture, learning processes, and innovation ecosystems [15, 17]. The emphasis on culture building and education resonates with ethnographic and qualitative studies that stress the importance of shared values, entrepreneurial norms, and human capital development in sustaining entrepreneurial marketing practices over time [18, 31].

Technology development and transfer emerged as a particularly salient strategy, reflecting the increasing convergence of entrepreneurial marketing with technological innovation. The findings suggest that technology-based businesses, science and technology parks, accelerators, artificial intelligence, and fintech solutions play a crucial role in enabling entrepreneurial marketing in international markets. This result is consistent with recent research demonstrating that digital and technological capabilities enhance firms' ability to innovate marketing processes, access global networks, and create differentiated value propositions [21, 30]. In the petrochemical sector, where technological sophistication is already high, the strategic integration of marketing-oriented technologies appears to be a key determinant of international competitiveness.

In terms of outcomes, the study identifies customer orientation, profitability, value creation, and international position as the primary consequences of effective entrepreneurial marketing development. These outcomes collectively illustrate that entrepreneurial marketing contributes not only to short-term financial performance but also to long-term strategic positioning and sustainable value creation. This finding aligns with empirical evidence showing that entrepreneurial marketing positively influences customer loyalty, market growth, and resilience under conditions of uncertainty [23, 24]. The emphasis on international position further supports studies indicating that entrepreneurial marketing enhances firms' global visibility, network integration, and adaptive capacity in international markets [13, 26].

Overall, the discussion demonstrates that the results of the present study are largely consistent with, and extend, existing entrepreneurial marketing theory by offering a comprehensive and industry-specific model tailored to the petrochemical sector and international markets. By integrating causal, contextual, strategic, and outcome dimensions, the model provides a nuanced understanding of how entrepreneurial marketing can be systematically developed in a complex and regulated industry. In doing so, the study contributes to bridging the gap between abstract entrepreneurial marketing concepts and their practical application in international industrial contexts [1, 4].

Despite its contributions, this study has several limitations that should be acknowledged. First, the qualitative and grounded theory approach, while suitable for theory development, limits the generalizability of the findings to other industries or national contexts. Second, the study relies on expert perceptions and managerial narratives, which may be influenced by subjective interpretations or contextual biases. Third, the focus on a specific industrial and institutional environment may restrict the direct transferability of the model to settings with different regulatory, technological, or cultural characteristics.

Future studies could empirically test the proposed model using quantitative or mixed-methods approaches to assess the strength and direction of relationships among identified categories. Comparative research across industries or countries could further refine the model and identify context-specific versus universal components of

entrepreneurial marketing development. Longitudinal studies may also provide deeper insight into how entrepreneurial marketing capabilities evolve over time in response to environmental changes and strategic interventions.

From a practical perspective, managers and policymakers should view entrepreneurial marketing as a strategic capability rather than a set of isolated marketing tools. Firms in the petrochemical industry are encouraged to invest in entrepreneurial skills development, digital infrastructure, and cross-functional collaboration to enhance international market responsiveness. Policymakers can support this process by creating stable regulatory environments, strengthening innovation ecosystems, and facilitating knowledge transfer between industry, academia, and entrepreneurial networks.

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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