



Development of a framework for the growth of technological entrepreneurship in FMCG companies

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ARTICLE INFO	ABSTRACT
<p><i>Received: 7 February 2023</i></p> <p><i>Reviewed: 1 March 2023</i></p> <p><i>Revised: 21 March 2023</i></p> <p><i>Accept: 28 April 2023</i></p>	<p>Technological entrepreneurship is an underlying and fundamental approach that enables the transformation of a creative idea into an entrepreneurial opportunity. The entrepreneur needs tools to be able to transform his ideas into operational innovation for hunting environmental opportunities. The growth of information and communication technology, as well as the wideness and ubiquity of the Internet, have provided these people with the right opportunity and tools. Entrepreneurial dreams can be turned into reality by using information technology facilities. According to the development of knowledge-based economies and the importance of using new technologies in economic growth, the field of technological entrepreneurship is expanding every day and includes wider dimensions. Technological entrepreneurship plays an important role in the process of creating a regional economy and sustainable development in the country. The need for technological entrepreneurship is because technology-based industries are rapidly expanding and replacing traditional industries. In this regard, the present research aims to identify the factors affecting the development of technological entrepreneurship capabilities in FMCG companies in order to develop and grow the culture of technological entrepreneurship. In this research, a conceptual framework is presented for the development of technological entrepreneurship, which can be a valuable guide for improving processes in knowledge-based organizations.</p>
<p>Keywords: <i>entrepreneurship, technological entrepreneurship, entrepreneurial growth, FMCG companies</i></p>	

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1. Introduction

Technological or technological entrepreneurship is a new field that originated from entrepreneurship. The purpose of technology entrepreneurship is to study the characteristics of entrepreneurial behaviors in environments focused on technology and new technologies. The study of technological entrepreneurship is important because it includes a combination of risk factors associated with entrepreneurship. Technological entrepreneurship is at a higher level than entrepreneurship and is the delivery of a new product or providing innovation in services in the field of new technologies. In other words, it is a process of engineering the future of a person, organization, or nation [1]. Technopreneur is an entrepreneur who has technological understanding, creativity, innovation, dynamism and the courage to be different are his characteristics. Technological entrepreneurs usually have different knowledge, skills, and characteristics than other entrepreneurs. They generally have adequate technical knowledge but lack general business-related skills [2].

Technological entrepreneurship consists of two concepts "entrepreneurship" and "technology". "Technology" means theoretical and practical knowledge, skills and tools that can be used in the creation and development of products and services. "Entrepreneurship" can also be defined as "identifying and exploiting inactive opportunities through creating new resources or combining existing resources in new ways, in order to develop and commercialize new products, obtain new markets, or provide services to new customers. Entrepreneurial opportunities are possibilities for creating future economic achievements that originate from the difference in perception and different understandings of the future value of resources (technologies) [3]. Therefore, entrepreneurial opportunities are situations in which new products, services, raw materials, and organizational methods can be introduced and offered by creating more value. An important point is that according to the definition of technology, every ordinary entrepreneurial opportunity also has aspects of technology. However, when technology becomes the main focus of entrepreneurship from a tool to achieve a goal, technological entrepreneurship emerges [4]. Considering the development of knowledge-based economies and finding the importance of using new technologies in economic growth, every day the field of technological entrepreneurship expands and includes wider dimensions. The fundamental point of this concept is that technological entrepreneurship seeks to bridge the gap between technology development and business creation (and value creation in general) [5]. Technological entrepreneurship is a process that begins with "recognizing new technologies and even creating technological opportunities with new discoveries." After "establishing a connection between market needs and these technologies," the technological entrepreneur proceeds to "exploit opportunities by offering commercial products and services." Therefore, technological entrepreneurship deals with adapting processes of initiatives and needs [6].

Therefore, various companies have not yet been able to achieve and develop the ideal technological entrepreneurship capabilities. In the development of technological entrepreneurship, there are various factors such as lack of interaction and technical skills, incorrect choice of technology, insufficient commitment to learning new technologies, and insufficient human capital that affect the compatibility of companies with the rate of progress in the technological business. Since the FMCG industry is very important due to the production of special and important products in people's daily life, the development of entrepreneurship in it is also multifold important. Therefore, paying attention to the importance of this industry, it is very important to provide a guide for the implementation of entrepreneurial technology [7]. For these reasons, this research provides a framework for the growth and development of technological entrepreneurship in this industry [8].

The structure of this research is as follows. In the second part, the literature review is presented. In the third part, technological entrepreneurship capability indicators are presented. In the fourth section, the conceptual framework is presented, and finally, in the fifth section, the conclusion is stated.

2. Literature Review

Population increase in developing countries, reduction of available resources and facilities in these countries and the emergence of new social and economic needs have all caused the institutions and responsible authorities in these countries to pay attention to these needs and think of fundamental or temporary solutions for them. According to the studies and based on the available statistics, one of the most important problems facing developing societies and even industrialized countries is the problem of unemployment [9].

The set of solutions presented to solve this global problem is called "technological entrepreneurship". Information technology management provides the achievement of the goals of technological entrepreneurship by using the capabilities of technology. In today's competitive and market-based economy, which is accompanied by rapid international changes and developments and has caused the process of transition from an industrial society to an information society, technological entrepreneurship is mentioned as the engine of economic development [10]. Technological entrepreneurship can play an important role in the economic growth of countries, creating employment and social welfare. Today, the national economy has given its place to the global economy. In this field, countries that do not limit job opportunities only to their geographical framework will be successful. Rather, they have a vast working space as wide as the world in their minds. In short, it can be said that today's organization management is based on the two axes of entrepreneurship management and information technology management [11].

The main role of technological entrepreneurship is to integrate the combination of unique people and heterogeneous assets, or in other words, to create and capture value for the company through shared experiences and discovery [12]. Technological entrepreneurship aims to solve the needs of society by accelerating the process of transforming new science and knowledge into technology and also seeks to create or develop and better manage organizations by applying these technologies and applications. In general, technological entrepreneurship is reflected in a system whose actors are interacting with activities related to identifying and developing technology, identifying technological opportunities, developing products, and developing and creating technological business. These four mentioned types are the main activities of technological entrepreneurs [13]. Finally, it can be said that technological entrepreneurship is somehow similar to entrepreneurial management, which includes all management activities and decisions related to the creation of new businesses and innovative development of new or improved resources, regardless of the scope of these activities [14].

Today it is clear that information and communication are two important powers. These two are both valuable and create value. A person who knows about different markets and the price of goods in those markets, or knows about the past and future of the market, can make better decisions to achieve more profit. In addition to its intrinsic value, information has another aspect that leads to knowledge and affects the mechanism of decision-making and its better performance. Communication is also valuable like information and gives people added value according to the size and type of communication [15]. Information and communication are the two basic tools needed for any technological entrepreneurial activity. Entrepreneurship is not possible in isolation and without the support of institutions, organizations, and people. Technological entrepreneurship requires the

discovery of a social need. And the discovery of social needs depends on knowing the community, its needs, and its cultural, social, and economic context [16]. In identifying the need for any entrepreneurial activity, an idea developer or theoretician must have insight and insight into the environment and know what solutions to meet that need have been provided in other parts of the world. Therefore, information and knowledge, like communication, are essential for any entrepreneurial activity [17]. Information technology, especially the Internet, has created new conditions. In it, producers, suppliers, sellers and customers, and almost all factors involved in an economic cycle are able to communicate with each other in a common virtual space. Also exchange information, services, products, and money. The Internet has brought new theories and theories, one of which is technological entrepreneurship [18].

3. Research methodology

The current research is qualitative research based on case studies, expert opinions, and a literature review. In this study, FMCG companies, as one of the most important companies influencing people's daily life, are considered as a case study. Experts are considered to be active people in the field of digital technologies in these industries, as well as academic experts with research records in the field of FMCG companies. 15 experts of the community of experts make up this research. In the first part of this research, an attempt has been made to extract the most important indicators of technological entrepreneurship in FMCG companies by reviewing the literature. Then, using the opinions of experts active in these industries and academic researchers these key indicators have been refined and their cause-and-effect relationships have been analyzed. An analytical framework has been presented with an emphasis on cause and effect relationships, and finally, this analytical framework was validated using the opinions of experts. Figure 1 shows the research methodology.

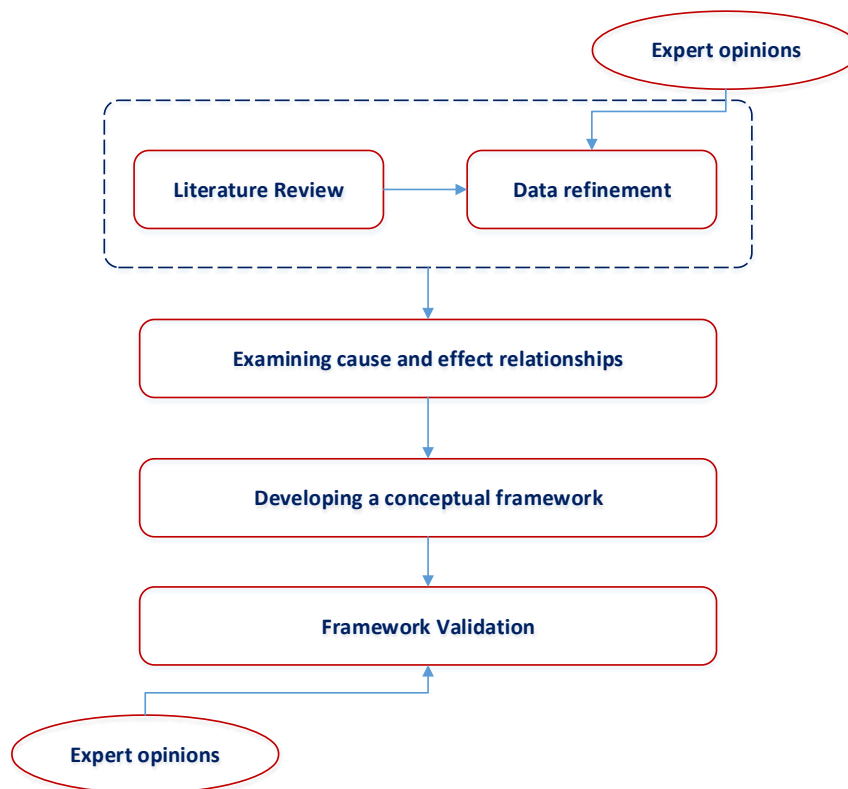


Fig. 1. Research methodology.

4. Indicators of technological entrepreneurship capability

Technological entrepreneurship is a business leadership style that includes "identifying technological opportunities with high growth potential, gathering resources and finally managing rapid growth and its significant risk by applying special decision-making skills." This concept is dedicated to the processes through which entrepreneurs use organizational resources and technical systems and strategies to achieve opportunities in entrepreneurial organizations. In fact, technological entrepreneurship can be considered an important strategic choice for individuals and companies to enter a new market or new business field and it can be defined as "the method and process of discovering, exploiting and exploring market opportunities for technologies".

Information technology, with its various features and capabilities, has been able to show remarkable flexibility in the field of entrepreneurship. These features have increased the efficiency of this technology in terms of technological entrepreneurship and job creation. In a general view, we can mention some characteristics of technological entrepreneurship:

- Increasing speed
- Increase accuracy
- Reducing the physical size of information repositories
- Fixing some administrative corruption
- Making it possible to work full time
- Enable remote collaboration
- Reducing system or organization costs

The use of technological entrepreneurship increases transparency in doing things and eliminates many intermediaries. These two key advantages lead to the elimination of some administrative corruption, especially at low levels. With the help of information technology, many inquiries and references of people, etc. are done automatically through computer networks.

Technological entrepreneurship capabilities in FMCG companies: According to research based on a literature review and conducting interviews with a group of experts, the indicators of entrepreneurship capabilities in FMCG companies were identified. These capabilities are shown in Figure 2. Technological entrepreneurship capability in the research framework is presented in five categories of individual capability, management capability, strategy, managerial, technical, and environmental in FMCG industries.

On the one hand, focusing on an idea and trying and practicing to develop and commercialize it, makes all the energy of the founders and the work team align with each other and finally, the final success is achieved. On the other hand, there is the concern that maybe the initial idea is not what it should be. What is meant by the idea of not being correct is a set of different factors, including undesirable functionality from a technical point of view or its impossibility in implementation, inappropriate time or place, lack of suitable financial resources, failure in marketing and sales, etc. This ultimately leads to the failure of entrepreneurship. This issue sometimes makes entrepreneurs think of moving several ideas together.

In addition to the mentioned cases, the demand market and the surrounding environment of entrepreneurs are always changing. These changes can turn the right idea at the right time and place into an unsuccessful option.

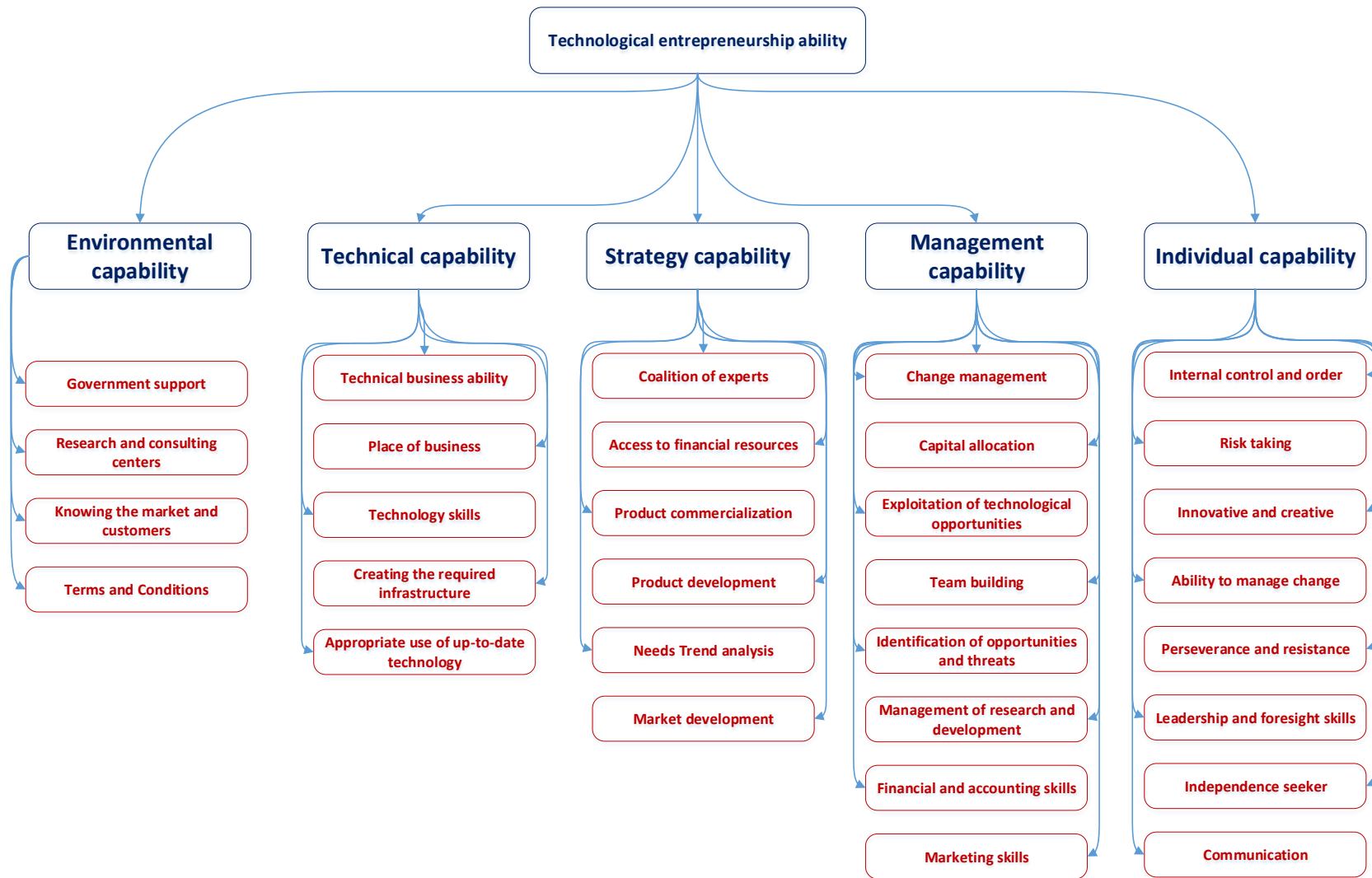


Fig. 2. Classification of technological entrepreneurship capability indicators.

It is obvious that in such a situation, especially in today's world of technology, where continuous changes in the market and the emergence of different technologies are considered to be its prominent features, observing the upcoming opportunities and using them optimally will be a decisive factor. In such markets, the keenness of an entrepreneur can lead to valuable opportunities that pave the way for a startup to generate income and even help advance the initial idea.

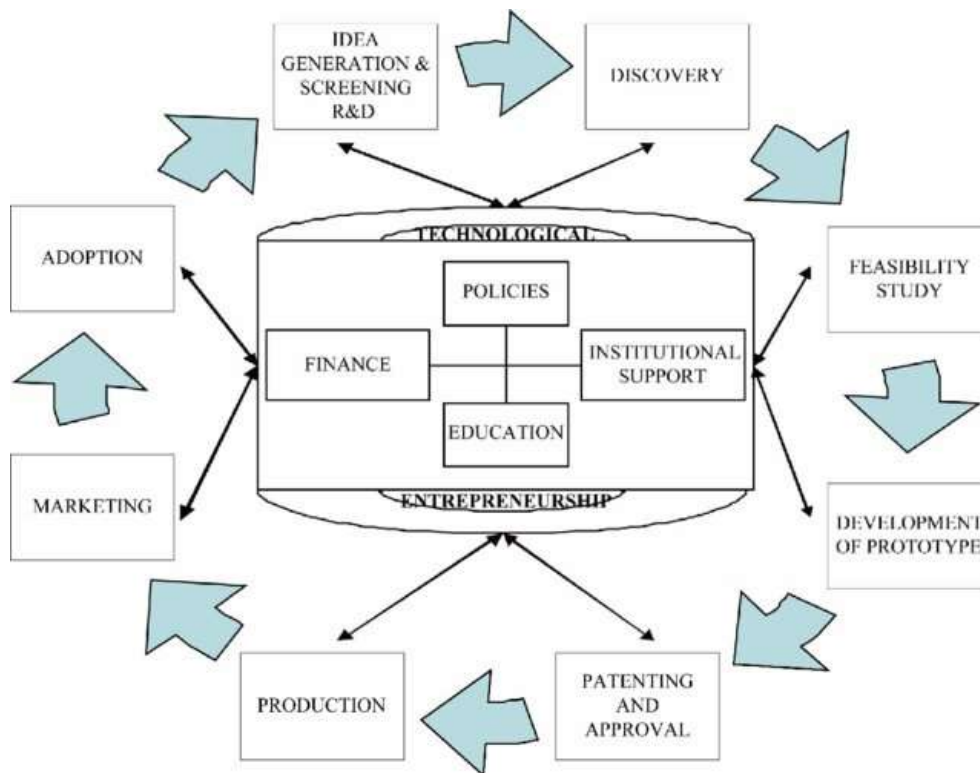


Fig. 3. Framework for technological entrepreneurship development [19]

As can be seen, technological entrepreneurship cannot be achieved without the presence of a technological entrepreneur, which also has divisions: a technological entrepreneur who is a technology developer and a researcher. A technology entrepreneur who produces a technological product. Another is an entrepreneur who has a supporting role in the development of a technology or is a product user. An opportunistic technology entrepreneur who only connects the supply or demand side through the establishment of a technology-based company.

Among the mentioned factors, organizational factors, environmental factors, and individual factors are the most influential factors on the adoption of open innovation in FMCG companies. In order to strengthen technological entrepreneurship with an open innovation approach in FMCG companies, special attention is needed to organizational factors. Therefore, organizational factors such as creating broad communication, clarity of innovation goals, strengthening existing organizational capabilities, including flexible organizational structure, empowering employees, entrepreneurial orientation, support and leadership of managers, increasing absorption capacity, creating an organizational culture

of open innovation, and managing the innovation process and resource management Finance can pave the way to choose the model of innovation.

In this regard, empowering employees and capable human resources under the support of management and in an organization with a flexible organizational structure and an open innovation culture can easily identify new technologies and technological opportunities so that the organization can wisely invest in new technologies. Such an organization provides the basis for market research with the participation of the business communication network to lead to the creation of innovative ideas. This path leads to the development of the existing business or the establishment of a new business, and as a result, value creation, innovative performance and competitive advantage for the company. Since environmental factors are the second most influential and higher than individual factors, this indicates the importance of these factors such as attracting foreign investors, specialized financial institutions, specific market characteristics and the dynamics of FMCG industries in the process of technological entrepreneurship. Of course, on the other hand, considering the nature of the categories categorized in environmental factors, including government laws, political and economic factors, and observing the impact of environmental factors in the technological entrepreneurship process, it can be seen that the FMCG technological entrepreneurship ecosystem is influenced by the government system.

5. Conclusion

It was observed that information technology has brought many changes in all social activities including technological entrepreneurship. This issue has been considered as the most important tool of modern entrepreneurship. Also, entrepreneurship in information technology has a wide scope for activity. Entrepreneurship is a requirement of technology development and technology development is the basis of entrepreneurship. Therefore, we are faced with a two-way interaction between the two, and based on the importance of the role of entrepreneurship, the duty of responsible civil and social institutions is determined.

Governments should develop and strengthen the entrepreneurship platform in the field of information technology, which is communication and information networks, and provide easy access to these networks for everyone. At the same time, they create and expand the culture of using networks and formulate and implement the necessary rules and regulations. On the other hand, in the private sectors of the FMCG industry, the technical support staff is increasing. This shows that fresh human forces are always needed in connection with new products or programs. In addition to the growth of IT capital, technological entrepreneurial activities also lead to the attraction of human resources. Therefore, it seems that these companies can go beyond their employment goals and contribute more to entrepreneurship. Also, the transfer of IT jobs abroad can be considered one of the potential capabilities of the IT labor market. Considering the above, especially the increase in speed, which causes more work to be done and full-time work, the productivity of the system increases, and as a result, it reduces a large number of costs.

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Conflicts of Interest

The author declares no conflict of interest related to this publication.

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