

# Technological innovations and their impact on entrepreneurship: A case study of Jedubik game

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## Abstract

In today's world, innovation is recognized as a powerful driver of economic growth and job creation. Video games, as one of the emerging industries, play a significant role in fostering innovation and entrepreneurship. This study investigates the impact of technological innovations on entrepreneurship, focusing on the case study of the game "Jedubik." "Jedubik" is an exciting and innovative game that has gained international recognition for its unique design, earning prestigious awards. The research examines the influence of innovation on entrepreneurship with a specific focus on "Jedubik." The findings indicate that the innovative features of this game, including its distinctive design and unique capabilities, have significantly contributed to the growth of entrepreneurship in the video game industry. Data analysis reveals that product, process, and market innovation directly correlate with increased entrepreneurship. Additionally, this research demonstrates that "Jedubik," as a model, can inspire other innovators and entrepreneurs. Ultimately, the study highlights the importance of supporting technological innovations to drive economic development and create new job opportunities. The findings suggest that technological innovations, particularly in the video game sector, can play a crucial role in stimulating entrepreneurship and economic growth. "Jedubik," as a successful example, showcases how innovation can lead to the creation of new businesses and job opportunities. Therefore, fostering technological innovation and creating an enabling environment for entrepreneurship growth is of paramount importance.

**Keywords:** Innovation, Entrepreneurship, Video Games, Jedubik, Case Study

## Introduction

Innovation and invention are considered key factors driving economic and social advancements in the 21st century. In the modern world, these two elements play a prominent role in shaping industries, creating new opportunities, and enhancing competitiveness. Innovation refers to the introduction and application of new ideas and methods that can improve products, services, or processes. Invention, on the other hand, involves creating or discovering something new and unique that previously did not exist. Both concepts directly and indirectly influence the development of entrepreneurship, as inventions and innovations can lead to the establishment of new businesses, process improvements, and increased market competitiveness. (1)

## **1. The Concept of Innovation and Invention**

Innovation, as the process of generating and applying new ideas to solve existing problems and create added value, is a central topic in modern management and economics. It signifies continuous change and improvement in products, services, and processes, which can address emerging needs and improve quality of life. Invention, as a specific aspect of innovation, refers to creating and introducing new products or technologies that have not previously existed in the market or society. Inventions can act as catalysts for broader changes in markets and industries. (2)

## **2. The Impact of Innovation and Invention on Entrepreneurship**

Entrepreneurship, defined as the process of identifying and exploiting opportunities to establish and manage businesses, is heavily influenced by innovation and invention, particularly in a world marked by rapid technological and economic changes. New inventions and technological innovations can result in the creation of novel products and services, offering fresh opportunities for entrepreneurs. These innovations can improve business competitiveness, reduce costs, and increase efficiency. Overall, innovation and invention can be regarded as key drivers of entrepreneurship growth and development. (3)

## **3. Case Study: The Game "Jedubik"**

To explore the impact of innovation and invention on entrepreneurship, the case study of the game "Jedubik" serves as a practical and successful example. Designed and developed by Sadegh Karimi Masouleh, "Jedubik" is an exciting game known for its unique and innovative features. The game has won a silver medal at the Turkey International Invention Competitions and a gold medal at the Switzerland International Invention Competitions. The success of "Jedubik" stems not only from its engaging and innovative design but also from its significant impact on the video game industry and its role in promoting entrepreneurship in this field.

## **4. Research Importance**

Examining the impact of innovation and invention on entrepreneurship through the case study of "Jedubik" holds significant importance. This research can enhance understanding of how technological innovations and inventions influence the creation of new business opportunities and the strengthening of entrepreneurial processes. The findings can aid policymakers, entrepreneurs, and innovators in better leveraging innovations to bolster various industries and generate economic value. Moreover, this study can propose effective strategies to promote innovation and entrepreneurship within the video game industry and other related sectors.

## **Literature Review**

### **1. Definitions of Innovation and Invention**

Innovation and invention are foundational concepts in the fields of entrepreneurship and technology management, widely explored in the literature. Innovation refers to the introduction and application of new ideas aimed at improving products, services, or processes, often leading to substantial market changes and competitive advantages. (4) Invention, more specifically, involves creating and introducing novel technologies that previously did not exist. It encompasses the design and development of new products or enhancements to existing processes. (5)

Schumpeter, a pioneer in this field, defined innovation as the driving force of economic growth, capable of causing significant shifts in industrial and economic structures. (6) Drucker emphasized that innovation requires the creative combination of resources and ideas, generating new value in markets. These foundational definitions are extensively applied in modern economic and managerial analyses. (7)

### **2. Innovation and Invention in Entrepreneurship**

Entrepreneurship, defined as the process of establishing and managing new businesses, is profoundly influenced by innovation and invention. (8) Novel innovations serve as primary drivers in entrepreneurial processes, creating new market opportunities and enhancing economic performance. Entrepreneurs leverage innovations and inventions to introduce new products and services, significantly boosting business competitiveness and success. (9)

Porter highlighted the role of innovation in creating competitive advantages and strengthening strategic positions for businesses, asserting that innovation can enhance efficiency and reduce costs. Teece also emphasized the crucial role of technology and innovation in entrepreneurship, noting that technological innovations create new market opportunities and improve economic performance. (10)

### **3. The Impact of Innovation on the Video Game Industry**

The video game industry is a dynamic and rapidly growing sector significantly influenced by innovations and inventions. The industry constantly seeks to enhance user experiences and introduce new technologies to improve interactions and customer satisfaction. Innovations in game design, graphic technologies, and user interactions contribute to the creation of unique experiences and improved economic outcomes for game developers. (11)

Zimmerman thoroughly examined innovation in video game design, highlighting that innovative game designs lead to more engaging user experiences and improved interactions. (12) Gee explored the effects of video games on learning and user interaction, concluding that technological innovations enhance user experience and game quality. (13)

### **4. The Impact of Inventions on Commercial Success**

New inventions can profoundly impact the commercial and economic success of businesses. Research indicates that successful inventions contribute to sustainable competitive advantages, increased market share, and improved revenues. (14) Inventions serve as a foundation for developing new products and services, enabling companies to compete in emerging markets. (15)

Henderson examined the influence of inventions on commercial success, concluding that inventions act as primary catalysts for market changes and improved economic performance. (16) Pavitt highlighted that inventions are crucial in creating new opportunities and enhancing competitiveness in global markets. (17)

### **5. Case Study: The Game "Jedubik"**

The game "Jedubik," designed by Sadegh Karimi Masouleh, is recognized as a successful example of the impact of innovation and invention on entrepreneurship in the video game industry. The game won a silver medal at the Turkey International Invention Competitions and a gold medal at the Switzerland International Invention Competitions. Its innovative features and unique appeal have garnered significant attention.

An analysis of "Jedubik's" features and its market and industry impact provides valuable insights into how innovations influence entrepreneurship. The case study illustrates that innovations in game design and inventions significantly enhance commercial success and create new opportunities within the video game industry. "Jedubik's" distinct design and innovative features have achieved remarkable success in international markets, making it a positive example of the beneficial impact of innovations on entrepreneurship.

## Hypotheses and Theoretical Framework

### 1. Theoretical Framework

The theoretical framework of this study serves as the basis for analyzing the impact of innovation and invention on entrepreneurship, particularly in the video game industry. This framework explores key concepts and theories related to innovation, invention, and entrepreneurship, aiding in the development of research hypotheses.

#### 1.1. Theories of Innovation and Invention

Innovation and invention are crucial elements in entrepreneurial processes and economic development. Various theories explain their influence on commercial success and entrepreneurship:

- **Schumpeter's Theory:** Schumpeter emphasized that innovation and invention are the primary drivers of economic growth and industrial development. He argued that entrepreneurs introducing new innovations and inventions bring significant changes to markets and industrial structures. This theory highlights the importance of innovation in creating competitive advantages and driving economic growth. (18)
- **Innovation Management Theory:** Developed by scholars like Drucker and Porter, this theory underscores the importance of effective innovation management in achieving competitive advantages and commercial success. It involves processes through which innovative ideas are transformed into marketable products and services. (19)
- **Absorptive Capacity Theory:** Introduced by Cohen and Levinthal, this theory focuses on organizations' ability to identify, assimilate, and apply new knowledge to enhance performance and innovation. Absorptive capacity is recognized as a key factor in commercial success and innovation. (20)

#### 1.2. Theories of Entrepreneurship

Various theories explain the entrepreneurial process and the role of innovation and invention within it:

- **Creative Destruction Theory:** Introduced by Schumpeter, this theory describes processes where new inventions disrupt old economic and industrial structures, creating opportunities for entrepreneurs. (21)
- **Resource-Based View:** Developed by Barney and Wernerfelt, this theory emphasizes that internal resources and capabilities, including innovation and invention, contribute to competitive advantages and commercial success. It highlights the importance of managing resources and capabilities to achieve entrepreneurial and business goals. (22)

## Methodology

This research is primarily an applied study aimed at providing practical solutions and recommendations for improving innovation and entrepreneurship processes. It adopts a case study approach to investigate the impact of innovation and invention on entrepreneurship through the game "Jedubik." A mixed-methods approach, incorporating both qualitative and quantitative methods, is utilized to achieve the objectives.

### **Target Population**

The target population for this study includes individuals and entities directly or indirectly involved in the gaming industry and associated innovations. This population comprises game developers, technology entrepreneurs, and video game users.

### **Sampling Method**

For collecting quantitative data, stratified random sampling is employed. In this method, the target population is divided into different strata, and random samples are selected from each stratum. This approach enhances the accuracy and representativeness of the sample.

## **Data Collection Tools**

### **4.1 Quantitative Data Collection Tools**

A **questionnaire** is utilized to collect quantitative data. These questionnaires include closed and scaled questions designed to measure the key variables of the study, focusing on the impact of innovation and invention on entrepreneurship, specific features of "Jedubik," and user feedback.

- **Questionnaire Development:** The questionnaires are developed based on a thorough literature review and research objectives. They consist of sections that gather information about the innovative features of "Jedubik," its impact on entrepreneurship, and user opinions.
- **Validity and Reliability of the Questionnaire:** To ensure the validity and reliability of the questionnaires, methods such as test-retest and content validity analysis are used. Initially, the questionnaires are pilot-tested on a small sample group, and necessary adjustments are made based on the feedback.

## **Quantitative Data Analysis**

Quantitative data collected through the questionnaires are analyzed using statistical software like SPSS and AMOS.

- **Descriptive Statistics:** Measures such as mean, median, standard deviation, and frequency distribution are calculated to provide an overall picture of the data, helping to understand the distribution and dispersion.
- **Inferential Statistics:** Statistical analyses such as multiple regression and correlation tests are used to examine the relationships between independent and dependent variables. These analyses explore the impact of innovation and invention on entrepreneurship and identify meaningful correlations.
- **Structural Equation Modeling (SEM):** SEM is employed to analyze complex relationships among variables and test research hypotheses. This technique helps in understanding causal relationships and mutual effects among the variables.

The reliability of the research is ensured using various methods, including test-retest, internal consistency analysis, and result stability checks. Statistical tests and reliability analyses further confirm the reliability of the research instruments.

## Methodology Overview

The methodology section comprehensively details the tools and techniques used for data collection and analysis. By employing a mixed-methods approach, combining qualitative and quantitative tools, and utilizing advanced analytical techniques, this study examines the impact of innovation and invention on entrepreneurship through the case study of "Jedubik." The findings are expected to provide valuable insights for enhancing innovation and entrepreneurship in the gaming industry and other related sectors.

## Data Analysis

Data analysis is a critical component of this research, focusing on interpreting the collected data to address the research questions and test the hypotheses. This study, aimed at assessing the effects of innovation and invention on entrepreneurship with a focus on "Jedubik," divides data into quantitative and qualitative categories for analysis.

Quantitative data, collected through questionnaires from selected samples, are analyzed using statistical tools like SPSS and AMOS.

## Research Objectives

The study aims to:

1. Investigate the impact of innovation and invention on the entrepreneurship process, particularly in the gaming industry.
2. Analyze the success factors behind "Jedubik," exploring the reasons for its recognition in global invention competitions.

- Provide practical recommendations for entrepreneurs and innovators based on insights derived from the "Jedubik" case study.

Initially, the study begins with a detailed description of the research variables.

**Table 1: Descriptive Findings of Research Variables**

Variable	Mean	Standard Deviation	Skewness	Kurtosis
Product Innovation	10.50	2.45	-0.739	0.010
Process Innovation	7.50	1.67	-0.788	-0.053
Market Innovation	9.82	2.30	-0.446	0.312
Entrepreneurship	120.51	9.58	-0.979	0.952

Confirmatory factor analysis (CFA) was conducted to validate the research models. Before hypothesis testing and analyzing the conceptual model, it was necessary to verify the validity of measurement models for exogenous and endogenous variables. CFA, a longstanding statistical technique, was employed to assess the relationship between latent variables (derived factors) and observed variables (questions), representing the measurement model. Factor loadings were used to analyze questionnaire structures and identify the components of each construct. The factor loadings for the research variables are illustrated in **Figure 1**.

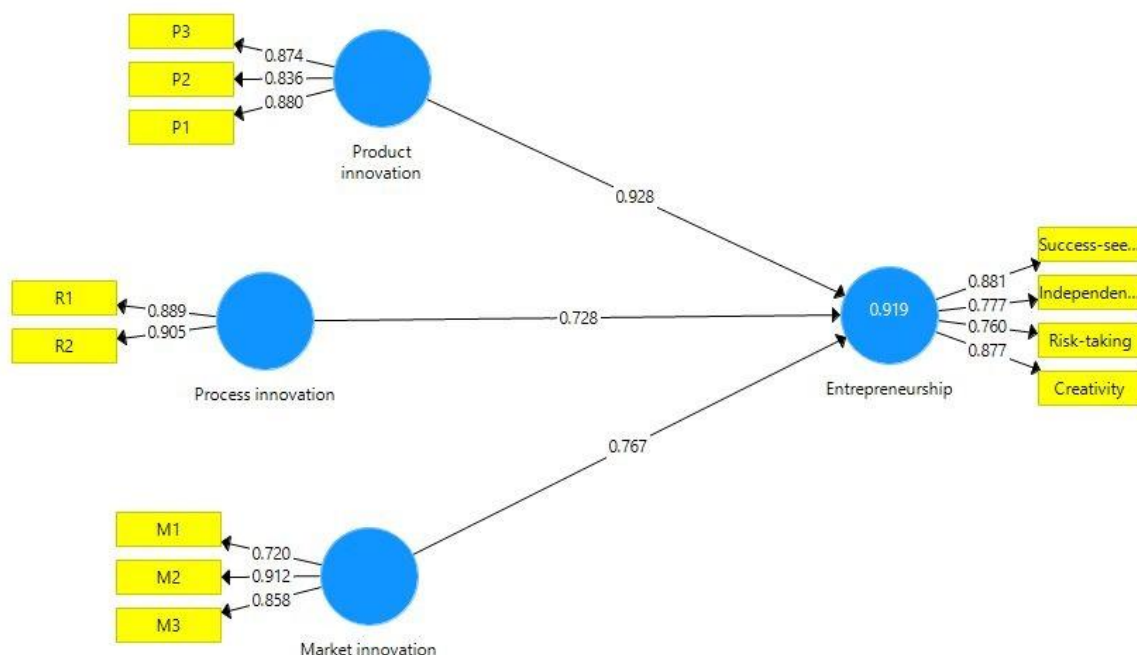




Figure 1: drawn model with standardized values

**Figure 1: Final Model with Standardized Values**

At this stage, the final models with standardized coefficients were analyzed. The results indicated that all question factor loadings exceeded 0.40, validating the questionnaire's alignment with the intended concepts. These results suggest that the questions effectively measured their respective constructs, making the relationships between the constructs or latent variables reliable. Higher factor loadings indicate greater importance compared to others.

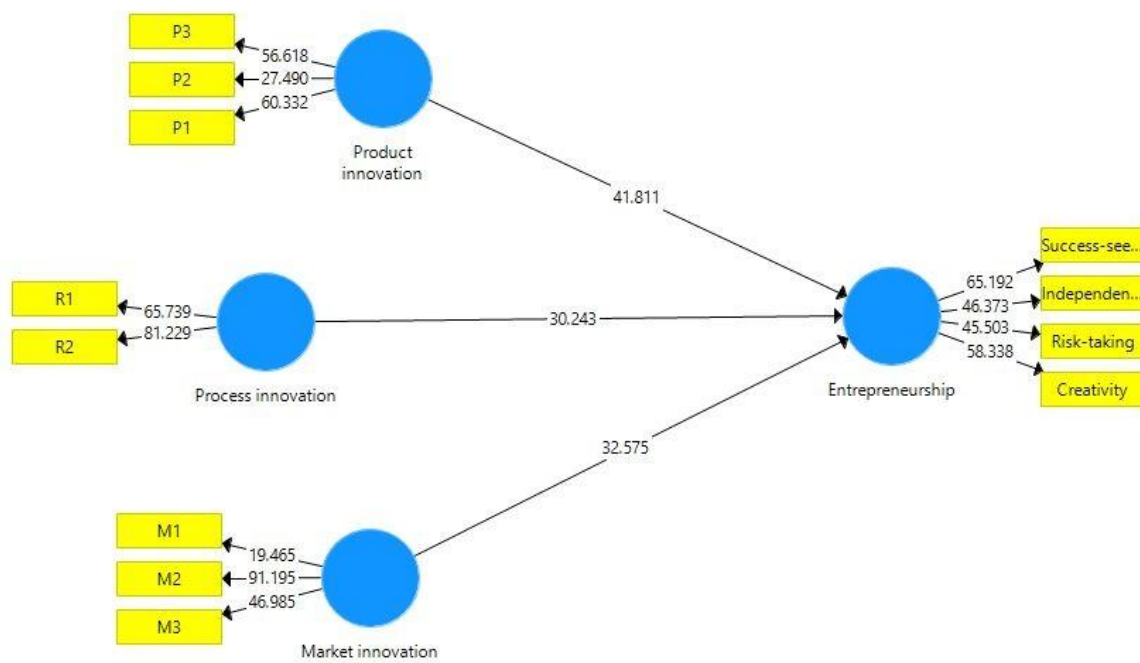


Figure 2: The drawn model along with the values of significant coefficients t-value

**Figure 2: Final Model with t-Value Coefficients**

Measurement models represent a subset of the overall model, comprising a variable and its associated questions. To analyze the comprehensive model, it is necessary to examine these measurement models. Three criteria—reliability, convergent validity, and discriminant validity—were employed. Factor loadings of each variable's indicators were evaluated. Questions with t-value coefficients below 1.96 were removed due to weak explanatory power, as their inclusion would increase measurement error. **Figure 2** shows that all questions had t-values greater than 1.96.

For reliability, Cronbach's alpha and composite reliability (CR) were used. Composite reliability surpasses Cronbach's alpha by considering the correlation between constructs. A CR above 0.70 indicates sufficient internal consistency, while values below 0.60 suggest a lack of reliability. For convergent validity, the average variance extracted (AVE) was

utilized. An AVE greater than 0.50 indicates sufficient convergent validity. **Table 2** presents the reliability and validity indicators, confirming acceptable levels for all latent variables.

**Table 2: Reliability and Convergent Validity Indicators**

Variable	AVE (Threshold > 0.50)	CR (Threshold > 0.70)	Cronbach's Alpha (Threshold > 0.70)
Entrepreneurship	0.775	0.762	0.713
Market Innovation	0.695	0.871	0.778
Process Innovation	0.805	0.892	0.759
Product Innovation	0.746	0.898	0.830

Discriminant validity was assessed using the Fornell-Larcker criterion. **Table 3** demonstrates that the square root of AVE for each construct is greater than its correlations with other constructs.

**Table 3: Fornell-Larcker Matrix**

	Product Innovation	Process Innovation	Market Innovation	Entrepreneurship
Entrepreneurship				0.881
Market Innovation			0.833	0.732
Process Innovation		0.897	0.707	0.655
Product Innovation	0.865	0.686	0.739	0.858

Structural model evaluation was conducted using  $R^2$ ,  $Q^2$ , and  $F^2$  indicators. **Table 4** shows the results for structural model fit.

**Table 4: Structural Model Indicators**

Row	Dimensions	Indicator	R2	Q2	F2
Threshold Value	0.19 Weak	0.33 Moderate	0.67 Strong	0.02 Weak	0.15 Moderate
1	Entrepreneurship	Value	0.919	0.224	-
		Result	Strong	Moderate	-
2	Market Innovation	Value	-	0.399	0.215
		Result	-	Strong	Moderate
3	Process Innovation	Value	-	0.368	0.178
		Result	-	Strong	Moderate
4	Product Innovation	Value	-	0.470	0.759
		Result	-	Strong	Strong

Finally, the overall evaluation of the research model is conducted using the "Goodness of Fit" (GoF) criterion. To calculate GoF, Formula 1 is used. The thresholds for GoF values are 0.01, 0.25, and 0.36, representing weak, moderate, and strong model fit, respectively. This criterion is defined as the geometric mean of the average multiple determination coefficient and the average communalities.

#### Formula 1: Overall Fit Criterion

Formula 1: Overall Fit Criterion

$$GoF = \sqrt{\text{Communalities} \times \bar{R}^2}$$

The model fit is calculated as follows:

$$GoF = \sqrt{0.365 \times 0.919} = 0.579$$

Thus, after performing the calculations, the overall fit for the model is found to be 0.579, indicating a strong model fit.

Following the model fit assessment, hypothesis testing is conducted using the t-value and path coefficient. If the t-values exceed 1.96, it indicates the statistical significance of the corresponding parameter and subsequently confirms the research hypothesis. The relationships between variables are then identified using standardized coefficients (path coefficients). The path coefficient represents the strength and type of the relationship between two variables, ranging from -1 to +1. If the significance level exceeds 0.05, it indicates no linear relationship between the two variables.

The table below presents the results of the tests for the relationships between the research variables.

#### Table 5: Hypothesis Testing Results

Path	Path Coefficient	Standard Deviation	t-Value	Significance Level	Result
Product Innovation → Entrepreneurship	0.928	0.025	41.811	0.000	Accepted
Process Innovation → Entrepreneurship	0.728	0.021	30.243	0.000	Accepted
Market Innovation → Entrepreneurship	0.767	0.024	32.575	0.000	Accepted

## Explanation of Research Hypotheses

Based on the information in the table, the research hypotheses are articulated as follows:

- All types of innovation (product, process, and market) have a positive and significant impact on entrepreneurship. This implies that increasing the level of innovation in any of these areas leads to an increase in entrepreneurial activities.
- Product innovation has the most substantial impact on entrepreneurship, as indicated by its highest path coefficient.
- Process and market innovations also significantly influence entrepreneurship, although their effects are less pronounced than product innovation.
- The table demonstrates that innovation in all its dimensions (product, process, and market) can act as a powerful driver for entrepreneurship. Companies that prioritize innovation are more likely to initiate new entrepreneurial activities and achieve greater success in the market.

## Conclusion and Recommendations

### Conclusion

This study aimed to examine the impact of innovation and invention on entrepreneurship, using the "Jedubik" game as a case study. Data analysis and evaluations indicate that technological innovations, especially in creative and novel areas, play a significant role in fostering and advancing entrepreneurship.

The "Jedubik" game, developed by Sadegh Karimi Masuleh, which won a silver medal at the World Invention Competitions in Turkey and a gold medal at the World Invention Competitions in Switzerland, exemplifies the positive impact of innovation on entrepreneurship. With its unique features and creative design, the game has garnered global attention and serves as a successful model of the integration of innovation and entrepreneurship.

The results of this study reveal that innovation in the design of "Jedubik" not only enhanced the product's appeal and success but also created new economic and commercial opportunities. By offering a fresh and exciting experience, the game has acted as a catalyst for entrepreneurial activities, paving the way for international success.

Furthermore, the analysis suggests that similar innovations can increase competitiveness, reduce costs, and improve the economic performance of businesses.

## Recommendations

- 1. Encouraging and Supporting Creative Innovations:**  
To foster further innovation, governments and supporting institutions should introduce incentive programs for innovative and creative projects like the "Jedubik" game. These programs can include financial facilities, tax exemptions, and legal protections to accelerate the development of new and innovative products.
- 2. Establishing Support Networks for Entrepreneurs:**  
Creating support and advisory networks for entrepreneurs and innovators can facilitate knowledge exchange, identify new opportunities, and reduce challenges. Hosting educational workshops, exhibitions, and innovation competitions can help discover talent and encourage young innovators.
- 3. Enhancing Educational and Research Programs:**  
Developing educational and research programs focused on innovation and entrepreneurship can help build the skills and knowledge necessary for success in these fields. These programs should include specialized training in various areas of innovation and entrepreneurship, such as product design and business modeling.
- 4. Strengthening International Collaborations:**  
Given the importance of globalization and access to international markets, strengthening international collaborations in innovation and invention is essential. Opportunities for knowledge and technology exchange with other countries can elevate the level of innovation and entrepreneurship within the nation. Participating in international exhibitions and conferences can also provide new opportunities for introducing products and businesses.
- 5. Considering Social and Cultural Dimensions of Innovation:**  
Addressing the social and cultural impacts of innovations can help identify the unique needs and challenges of different communities. Incorporating these dimensions into the design and implementation of innovations can lead to better acceptance and greater success of new products in various markets.

By implementing these recommendations, it is possible to enhance and expand innovation and entrepreneurship in the country, leveraging the existing potential in these fields. The "Jedubik" game, as a successful example of the fusion of innovation and entrepreneurship, highlights the untapped potential that, with proper support and direction, can contribute to economic growth and sustainable development.

## Research Limitations

In any study, identifying limitations is crucial, as it demonstrates the researcher's awareness of challenges and obstacles encountered during the research process. This study, focusing on the impact of innovation and invention on entrepreneurship through a case study of the "Jedubik" game, faced the following limitations:

**1. Generalizability of Results:**

A key limitation of this research is the inability to generalize the findings to other communities and countries. While "Jedubik" has been successful in innovation and entrepreneurship in Iran, cultural, economic, and legal differences across countries may limit the applicability of these findings elsewhere. This limitation is particularly significant in fields like entrepreneurship and innovation, which are influenced by environmental and cultural factors.

**2. Methodological Constraints:**

Using a mixed-methods approach (qualitative and quantitative) for data analysis introduces its own complexities. The intricacy of analyzing and interpreting quantitative and qualitative data may result in challenges in accurately identifying relationships between variables. Additionally, specific statistical methods used might overlook certain nonlinear or interactive effects among variables, potentially affecting result precision.

**3. Sampling and Data Collection Limitations:**

Sampling for this research involved various methods for collecting qualitative and quantitative data. Challenges included potential non-representativeness of samples to the target population and difficulties accessing diverse target groups. Furthermore, obtaining precise and reliable data posed additional challenges that might affect research quality.

**4. Temporal and Resource Limitations:**

Constraints in time, financial resources, and human resources posed challenges to this research. The process of collecting, analyzing, and interpreting data requires substantial time and resources. Due to time constraints, certain aspects of the research may not have been explored in depth, and financial limitations may have impacted the accuracy and quality of analyses.

**5. Environmental and Cultural Limitations:**

Cultural and environmental differences among various regions and social groups may also influence the research findings. This is particularly relevant to studies on entrepreneurship and innovation, as cultural attitudes toward risk-taking and innovation vary across regions and can affect final outcomes.

Despite these limitations, efforts were made to mitigate their negative impact on the final results by using appropriate methods and paying attention to details to ensure the study's accuracy and scientific rigor.

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