KMAN PUBLISHING INSTITUTE
Journal Website

Article history:
Received 05 November 2023
Revised 13 December 2023
Accepted 19 December 2023
Published online 01 January 2024

International Journal of Innovation Management and Organizational Behavior

Volume 4, Issue 1, pp 91-99

IJIMOB International Journal of Innovation Management and Organizational Behavior

E-ISSN: 3041-8992

Presenting a Commercialization Model of Knowledge Emphasizing the Role of Science and Technology Parks in the Relationship Between University and Industry (A Case Study of Knowledge-Based Companies in the Central Province Science and Technology Park)

Narges. Davari[1], Mohammad Hassan. Pardakhtchi[2]*, Gholam Ali. Ahmadi[3]

[1] PhD Student, Educational Management, North Tehran Branch, Islamic Azad University, Tehran, Iran
[2] Professor, Department of Educational Sciences, Shahid Beheshti University, Tehran, Iran
[3] Associate Professor, Curriculum Studies Department, Shahid Rajaee Tarbiat University, Tehran, Iran

*** Corresponding author email address**: mhpardakhtchi@gmail.com

A r t i c l e I n f o

Article type:
Original Research

How to cite this article:
Davari, N., Pardakhtchi, M. H., & Ahmadi, G. A. (2024). Identification and Analysis of Supply Chain and Supplier Risks Using Frog-Leaping and Genetic Algorithms (A Case Study in the Automotive Industry). *International Journal of Innovation Management and Organizational Behavior*, *4*(1), 91-99.
https://doi.org/10.61838/kman.ijimob.4.1.11

A B S T R A C T

Objective: The commercialization of knowledge and technology is an important part of the innovation process. Commercialization implies scaling up from prototype to mass production and gaining access to more resources.
Methodology: This research, by nature, is exploratory and was conducted using a descriptive-analytical method based on grounded theory, aiming to identify the components of knowledge commercialization with an emphasis on the role of science and technology parks in Iran. In the qualitative part, purposive sampling was employed with 12 individuals, where this type of sampling involves selecting units of study based on the research goal rather than at random. In the quantitative part, stratified random sampling was used, and samples were selected for each of the groups mentioned above proportionally to their population relative to the entire statistical population, using the Krejcie and Morgan table, resulting in the use of 300 questionnaires and ultimately, 232 questionnaires were collected and analyzed. For data analysis, factor loadings, Cronbach's alpha tests, composite reliability, and average variance extracted (AVE), the PLS algorithm was utilized.
Findings: The findings indicated that ten dimensions have been identified as components of knowledge commercialization based on the role of science and technology parks: educational-scientific dimension, financial-economic dimension, management dimension, process structure dimension, communicational dimension, legal dimension, socio-cultural dimension, support dimension, opportunities dimension, and threats dimension.
Conclusion: The results show that the cultural and communicational dimensions are the most effective components, and the threats dimension is the least effective component of knowledge commercialization.

Keywords: *Knowledge-based, Commercialization, Science and Technology Park, University, Business*

1 Introduction

Knowledge produced by academic researchers and scientific institutions is recognized as a potential key driver for technological advancement. Recent global policies have been set with the goal of increasing business-oriented activities in universities (Salamati et al., 2016; Wong & Singh, 2014; Yadollahi Farsi et al., 2011). The historical emergence of university missions includes education, research, social services, and technology. At the dawn of the new millennium, "the mission of higher education, which is the foundation of all activities and orientations of this significant social institution, is undergoing a fundamental transformation towards ethics-oriented improvement of human and society". Greater attention to the public domain and social space creation, while striving to maintain constructive and close relationships with decision-makers and policymakers, and the desire to be present and impactful on the global stage (F. et al., 2016; Salamati et al., 2016; Wissema, 2009). are among the missions that are considered in the wave of activities of thought-generating institutions like universities. Cultural wars in universities were partly due to shifts in alignments in intergenerational relationships. The sexual revolution in the 1960s and widespread political movements in the United States regarding civil rights and opposition to the Vietnam War gave new meaning to the political affair. Students began to question the content of courses and the way of teaching, and academicians started to rethink the content and nature of educational programs. The battle between two narratives of culture (culture of two generations or groups and society) is no longer just a battle of definitions but a comprehensive fight and part of the global political body in the new millennium (AliAsghar et al., 2010; Oyo et al., 2008).

The university environment is naturally a vibrant, innovative, and creative environment. It's a place for the growth of personalities, the bubbling up of talents, and the emergence of hidden bright spots. What is deemed undesirable from a youthful, idealistic perspective is most sensitively addressed in the university environment (Salamati et al., 2016; Shafiei, 2013). There is ample evidence supporting the influence of the university atmosphere on academics. One study on first-year students concluded that newcomers quickly grasp the nature of expectations, standards, and values of the university and align themselves with them, so much so that they become indistinguishable from older individuals (Salamati et al., 2016; Wong & Singh, 2014; Yadollahi Farsi et al., 2011). The function of higher education is not only quantitative development to fulfill its missions but also the qualitative development of these missions and the outputs of universities are important.

The commercialization of knowledge and technology is an important part of the innovation process, and no technology or product successfully enters the market without undergoing this process. Commercialization implies scaling up from prototype to mass production and gaining access to more resources (Yadollahi Farsi et al., 2011). There are obstacles and limitations in the path of knowledge commercialization. Weak communications and the lack of networking among investors, industry practitioners, and academics; weak national intellectual property protection laws; bureaucracy and inflexibility of university management systems; cultural differences between industry practitioners and academics; low quality of produced knowledge and technologies in line with labor market needs; and lack of motivation and perceived need for knowledge commercialization in universities are among the most significant barriers to knowledge commercialization in the country's universities (Bandarian, 2009; Salamati et al., 2016).

Knowledge and technology are considered fundamental factors in creating wealth, capability, and knowledge of countries and are a powerful means in national development. Commercialization of research has increased policy-making and management topics and has initiated changes in universities, companies, and society (Spilling, 2004; Talebi et al., 2011; Wissema, 2009). The entrepreneurial university or fourth-generation university is an excellence-oriented generation where the university becomes the center of all scientific, technological, and cultural developments, and its connection with the internal and international world will play an active and initiating role (Bandarian, 2009; Behbudi & Amiri, 2010). The first-generation university educated "professionals." The second-generation university educated not only professional experts but also "scientists." However, the third-generation university, alongside professional experts and scientists, educates "entrepreneurs" (Wissema, 2009). The most important expectation of society from the university, as one of its main members, is to have economic and social value creation through the knowledge produced by researchers. The main strategies to achieve this goal include creating an entrepreneurial culture and orientation among professors and students, establishing university startups and spin-offs, science and technology parks, incubators, accelerators, establishing university research

IJIMOB
E-ISSN: 3041-8992

centers, and strengthening the entrepreneurship ecosystem through industry-university collaborations (Oyo et al., 2008). With the highlighted role of science and technology parks in the economic development of many developed countries and the increase in their number in the last two decades as one of the backbones of the national innovation system and their effective role in creating value and developing innovation and contributing to strengthening the idea to market chain in knowledge-based economies, many developing countries have made considerable efforts to invest in this area in the last two decades.

In this article, which aims to design an appropriate model for knowledge commercialization to explain the role of science and technology parks in relation to the interaction between university and industry, the following questions are raised: What is the appropriate model of knowledge commercialization for explaining the role of science and technology parks in relation to the interaction between university and industry in Iran? What are the components of knowledge commercialization with an emphasis on the role of science and technology parks in Iran? These issues prompted the author to conduct more extensive research and field surveys to examine the dimensions of the problem and the components of knowledge commercialization based on the role of science and technology parks in Iran.

2 Methods and Materials

The present study, by nature, is exploratory research. In such research, instead of testing hypotheses, the goal is to collect patterns and ideas to gain a deep understanding of the subject. For this purpose, a mixed research approach is used, which in fact combines quantitative and qualitative research methods, approaches, and techniques in one study. To achieve the research objective of "identifying the components of knowledge commercialization with an emphasis on the role of science and technology parks," based on the components found, the grounded theory research method was employed.

To develop the theory, the Strauss and Corbin approach was used, and the final model of the research was presented. In the second part, firstly, the validity of the model derived from the research was examined using expert surveys, and then the model was evaluated in the target population through a questionnaire. In the model evaluation (model validation), the study population includes managers and experts of knowledge-based companies located in the Science and Technology Park of the city of Arak, comprising 31 companies.

In the qualitative part, purposive sampling was used, which includes selecting research units based on the research goal and not just randomly. In the quantitative part, stratified random sampling was used, and a sample was selected for each of the groups mentioned above relative to their population to the entire statistical population, using the Krejcie and Morgan table. For conducting expert surveys and for assessing the validity of the model derived from the research, 12 qualified experts were identified, meetings were held with them, and after explaining the research goal and methodology, a questionnaire was provided to them, and after persistent follow-up, 7 questionnaires were returned. Subsequently, for model validation, 300 questionnaires were used, and ultimately, 232 questionnaires were collected and entered into the analysis process.

For data analysis, factor loadings, Cronbach's alpha tests, composite reliability, and average variance extracted (AVE), the PLS algorithm (SMART PLS software) were used. Based on the findings from the interviews, we will explain the research model. The network of knowledge commercialization themes includes 10 dimensions: educational-scientific dimension, financial-economic dimension, management dimension, process structure dimension, communicational dimension, legal dimension, socio-cultural dimension, support dimension, opportunities dimension, and threats dimension.

3 Findings and Results

The survey findings regarding the demography of the statistical samples show that men constituted 73% of the population compared to women. The highest level of education was Bachelor's degree with 34.8%, the majority of the population is aged between 26 to 35 years, and 41.5% of the statistical population has a work experience of 4 to 7 years.

Model reliability means the generalizability of the model results from one sample to another within the same population. To examine reliability, various tests such as Cronbach's alpha, composite reliability, rho_a test, and shared reliability test were used, the results of which are presented in the Table 1.

IJIMOB
E-ISSN: 3041-8992

Table 1

Cronbach's Alpha Coefficients

Variable	Cronbach's Alpha	Composite Reliability	rho_a	Shared Reliability Test
Structural Aspect	0.725	0.877	0.755	0.782
Scientific Aspect	0.811	0.888	0.828	0.727
Communicational Aspect	0.930	0.955	0.939	0.877
Cultural Aspect	0.751	0.886	0.817	0.796
Opportunities Aspect	0.920	0.941	0.926	0.762
Legal Aspect	0.787	0.904	0.788	0.824
Supportive Aspect	0.866	0.936	0.890	0.880
Financial Aspect	0.829	0.921	0.831	0.854
Management Aspect	0.834	0.884	0.844	0.608
Threats Aspect	0.905	0.930	0.909	0.728

The model's reliability, based on Cronbach's alpha coefficient for its data across each variable, is above 0.7 and is considered acceptable; therefore, reliability is confirmed by Cronbach's alpha. Composite reliability (CR) should be CR>0.7, which is confirmed as such in the corresponding column. In Spearman's correlation or rho_a, the value must also be above 0.7 to be considered acceptable, and the value of shared reliability must be above 0.5 to be confirmed.

Table 2

Convergent Validity

Variable	Average Variance Extracted (AVE)
Structural Aspect	0.782
Scientific Aspect	0.727
Communicational Aspect	0.877
Cultural Aspect	0.796
Opportunities Aspect	0.762
Legal Aspect	0.824
Supportive Aspect	0.880
Financial Aspect	0.854
Management Aspect	0.608
Threats Aspect	0.728

Convergent validity (validity) is calculated by the AVE criterion, which represents the average variance shared between each construct and its indicators. AVE indicates the correlation of a construct with its own indicators, where a higher correlation implies better fit. This index should be above the number 0.5.

The results of the convergent validity examination are presented in the Table 2: If the average variance extracted is less than the criterion of 0.5 for the variable in question, the item with the lowest factor loading is removed, and the average variance extracted is recalculated. In this model, the average variance extracted index for all variables is more than 0.5, indicating the presence of convergent validity.

Table 3

Reflective Model Measurement Quality Test

Variable	CV COM
Structural Aspect	0.310
Scientific Aspect	0.430
Communicational Aspect	0.654
Cultural Aspect	0.339
Opportunities Aspect	0.607
Legal Aspect	0.386
Supportive Aspect	0.490

IJIMOB
E-ISSN: 3041-8992

Financial Aspect	0.443
Management Aspect	0.410
Threats Aspect	0.561

To ensure a suitable quality of prediction, an index known as the cross-validated redundancy index, or CV COM, was used. All CV COM values of the measurement model are above 0.15 or average, indicating that our measurement model is of suitable quality. Additionally, considering the obtained value for the Q2 index, the structural model quality for the model variable is above the strong level (0.02, 0.15, 0.35). Therefore, the research's structural model is of suitable quality.

Table 4

Significance of Path Coefficients at 99% Confidence Level

Relationships	Path Coefficient	Significance Value	Confirmation/Rejection
Structural Aspect >>> Knowledge Commercialization	0.164	3.303	Confirmed
Scientific Aspect >>> Knowledge Commercialization	0.140	3.476	Confirmed
Communicational Aspect >>> Knowledge Commercialization	0.241	4.168	Confirmed
Cultural Aspect >>> Knowledge Commercialization	0.287	3.434	Confirmed
Opportunities Aspect >>> Knowledge Commercialization	0.216	4.376	Confirmed
Legal Aspect >>> Knowledge Commercialization	0.105	2.382	Confirmed
Supportive Aspect >>> Knowledge Commercialization	0.121	3.434	Confirmed
Financial Aspect >>> Knowledge Commercialization	0.109	3.424	Confirmed
Management Aspect >>> Knowledge Commercialization	0.103	3.070	Confirmed
Threats Aspect >>> Knowledge Commercialization	-0.411	7.623	Confirmed

Another index for confirming relationships in the structural model is the significance of path coefficients, displayed in Table 4. The significance of path coefficients complements the magnitude and direction of the model's beta coefficient sign. If the obtained value is above the minimum statistic at the considered confidence level, that relationship or hypothesis is confirmed. At significance levels of 90%, 95%, and 99%, this value is compared with minimum t-statistics of 1.64, 1.96, and 2.58, respectively.

Based on the results of the significance of path coefficients, all factors affecting knowledge commercialization have a significant impact, and the path coefficient of all variables is positive except for the threats variable, which has a significant and negative impact on knowledge commercialization. Moreover, the GOF index for the research model is obtained at 0.7997, indicating the overall desirability of the research models.

4 Discussion and Conclusion

The current research aimed to identify the factors affecting the commercialization of knowledge with an emphasis on the role of science and technology parks, to identify the limitations, obstacles, and challenges of knowledge commercialization with the help of science and technology parks, and to offer solutions. In this regard, after interviewing 12 experts and collecting information, the interviews were coded using grounded theory. The network of themes for knowledge commercialization includes 10 dimensions: educational-scientific dimension (including practical training, scientific quality, and training through seminars), financial-economic dimension (financial support for knowledge-based companies and a stable economic situation), management dimension (management of expert and elite human resources, problem identification, business model, competitive advantage, and planning), structures and processes dimension (revision of the duties of science and technology parks, improvement of work processes), communicational dimension (university-industry interaction), legal dimension (strategic laws and support laws), socio-cultural dimension (entrepreneurship culture and support culture), support dimension (support for knowledge-based companies and idea developers), opportunities dimension (technological, international environment, human resources, business environment, access to resources), and threats dimension (educational-scientific, economic, international conditions, management, social culture).

According to the findings and the research model, the central phenomenon of the research was the commercialization of knowledge, with the identified causal conditions being: entrepreneurial attitude, knowledge-based

IJIMOB
E-ISSN: 3041-8992

view of the industry, virgin business environment, and rich and abundant resources.

Higher education, by transferring applied knowledge in the field of employment, creating skills and abilities required for entrepreneurship, and fostering an entrepreneurial attitude, has introduced entrepreneurship concepts into the university and directs students' knowledge, attitudes, and skills towards entrepreneurship and becoming entrepreneurs (Talebi et al., 2011; Yadollahi Farsi et al., 2011). Attitudes can still be changed through education and learning. Therefore, having an entrepreneurial attitude can be among the factors that help create the phenomenon known as knowledge commercialization. Viewing the industry from a knowledge-based perspective, considering the industry's knowledge aspect from a management, productivity, and progress perspective is also valuable. The university foundation is the education of specialized and trained human resources. The knowledge of academics, leading to the presentation of new opinions and ideas in the industry, can become economic development and knowledge commercialization. Also, the factor of a virgin business environment in this research is effective in knowledge commercialization, with the presence of successful startups in any industry in the country indicating the existence of such an environment (AliAsghar et al., 2010; Bandarian, 2009; Salamati et al., 2016; Shafiei, 2013). Finally, the presence of rich and abundant resources in the Central Province (such as petrochemical products, aluminum ingots, juices, chemicals, various glasses, foundry products, polyester fibers, meat, edible offal, and flowers and plants) can stimulate and attract the attention of many industrialists and academics towards knowledge commercialization.

Contextual conditions identified in this research include society, university, industry, and knowledge-based companies. The emergence of the importance and role of scientific knowledge in innovations and the development of new businesses on one hand, and the increase in population entry rates into higher education on the other hand, have positioned universities as one of the main and fundamental players in innovation and comprehensive development of countries. Therefore, in the commercialization process, academic research plays an important role in the country's development, materializing superior ideas, and also in academic entrepreneurship. Most universities have established close relationships with private companies to gain a superior position and strive to expand their range of activities. This has led to the creation of various forms of cooperation with the industry and efforts to commercialize research outcomes as a fundamental principle alongside teaching and research. Another foundation for knowledge commercialization is the industry, and given that the Central Province is one of the industrial hubs of the country, it has made the relationship between industry and university for the purpose of commercialization much easier. The Central Province has 37 active industrial towns and parks, and Arak is among the industrial cities of the country that ranks first in terms of diversity of industrial products, second in the presence of major industries, and overall, one of the four industrial hubs of the country. This city, due to the presence of major industries, is the largest and first manufacturer of construction machinery, the largest wagon and locomotive manufacturer, the largest combine manufacturer, the largest producer of hydraulic cranes and lifts in the Middle East, and also with producing 80% of energy equipment, an aluminum producer, the largest volume of machine manufacturing, production of telecommunications infrastructure (companies such as Avangan, Yasan, and Gam), gasoline, and the largest mining industries in the country, is known as the industrial capital of Iran. Additionally, knowledge-based companies as another contextual factor, are knowledge-driven businesses that have been formed with the goal of sustainably converting knowledge into wealth, and their economic activities are based and accompanied by research and development activities in the field of new and advanced technologies, thereby leading to the development of a knowledge-based economy in a society, thus providing a foundation for the commercialization of knowledge.

Intervening conditions in this research include laws and regulations, structures and processes, university-industry cooperation, managers and the government, economic factors, technological factors, socio-cultural factors, and the international environment. External laws and regulations such as government laws or internal industry, university, or knowledge-based company regulations can act as both a facilitator and a barrier to commercialization. If laws can be drafted to assist companies or universities in knowledge commercialization, they can facilitate the commercialization process. Conversely, if the laws and regulations refer to bureaucratic paperwork or strict banking or financial institution regulations for assisting industries and knowledge-based companies, they are seen as obstacles. The existing structures and processes in industry, universities, or knowledge-based companies are another intervening factor that is closely related to their laws and regulations. The presence of complex or simple processes among organizational units in industries and also universities, the

IJIMOB
E-ISSN: 3041-8992

presence of vertical and hierarchical or horizontal and flat structures, slow or quick responsiveness, high or low formality, etc., can affect the speed or lack thereof in knowledge commercialization. University and industry cooperation for the purpose of knowledge commercialization is a very clear and evident factor; without the necessary cooperation between the university and industry, there will be no knowledge commercialization. Managers and the government are another intervening factor affecting knowledge commercialization. University managers pay attention to the selection of commercialization strategies for academic research as an important factor in enhancing the process of designing and developing academic products. Industrial managers also trust the knowledge produced in universities and use it to create their products and services.

Economic factors have effective strategies to accelerate the focus on knowledge commercialization, including creating suitable platforms in society for fostering financial motivation, providing data and information for secure investments and future forecasting by the government through the development of new strategies and enactment of supportive laws including policy stability, interest rate reduction, long-term tax exemptions, and capital provision and allocation for loans. Also, technology innovation, product manufacturing, and technical knowledge in the form of tangible goods or products are intervening factors. Entering today's business world with technology, commercialization, and the added value it brings is the solution; the presence of new technologies and the use of technology are prerequisites for knowledge commercialization; commercializing knowledge itself is very important for creating new technology. The commercialization process, the transfer of knowledge and technology from research centers such as growth centers and science and technology parks to existing industries or new businesses, is crucial. Attention to fostering an entrepreneurial culture; focus on the necessary education for applying knowledge; the existence of a culture of effort and striving, attention to scientific topics in society, education for children in schools and families for learning and applying knowledge, etc., as instances of socio-cultural factors, can help knowledge commercialization in the long term. The international environment can also act as a barrier to knowledge commercialization as well as an opportunity for it. This environment provides a platform for exporting industrially produced goods, creates competition among companies, and increases the academic connection between industry and university or acts as a barrier, leading to increased imports, various sanctions, and heavy and unfair competition in the Central Province.

The necessary strategies for commercialization in this research are education, university-industry interaction, higher education through the transfer of applied knowledge in the field of employment, creating the necessary skills and abilities for entrepreneurship, fostering a cultural environment and research support for entrepreneurship, and directing students' knowledge, attitudes, and skills towards entrepreneurship and becoming entrepreneurs, facilitating legal commercial conditions, and comprehensive support are crucial. Ultimately, the outcomes obtained from knowledge commercialization in this research include: an increase in income through the creation of new products, innovative innovations, or new technologies. Another outcome is foresight created by the interaction between industry and university, where the university becomes aware of the industry's needs, and the industry provides its support to academics for the creation of applied science, easily foreseeing the future for progress, development, and prosperity of the country, and will assist in scientific development of the industry as the next outcome. The next outcome is economic prosperity, which is created following an increase in income, and this, in turn, will lead to the next outcome, which is the reduction of unemployment. Increased income, economic prosperity, and the reduction of unemployment will undoubtedly lead to the general satisfaction of society.

This study, while contributing valuable insights into the commercialization of knowledge with an emphasis on the role of science and technology parks, is not without its limitations. First, the research was geographically constrained to the Central Province, which may limit the generalizability of the findings to other regions or countries with different industrial and economic contexts. Furthermore, the study primarily relied on qualitative interviews and surveys for data collection, which might introduce subjective biases from both the respondents and the researchers. Lastly, the rapidly evolving nature of technology and market demands means that the identified factors influencing knowledge commercialization may require continuous reevaluation to remain relevant.

Future research could expand upon this study by exploring the commercialization of knowledge in diverse geographical settings to enhance the generalizability of the findings. Comparative studies between regions or countries with varying economic and technological landscapes could

IJIMOB
E-ISSN: 3041-8992

provide deeper insights into the universal and unique factors influencing knowledge commercialization. Additionally, employing longitudinal research designs could help in understanding the temporal changes in the commercialization process and the long-term impacts of science and technology parks on innovation ecosystems. Investigating the role of digital transformation and artificial intelligence in knowledge commercialization could also offer fresh perspectives and contribute to the body of knowledge in this field.

The findings of this study have practical implications for policymakers, university administrators, and industry leaders. For policymakers, the importance of creating supportive legal frameworks and financial incentives for knowledge-based companies is clear. Policies promoting entrepreneurship education within higher education institutions and fostering closer university-industry collaborations can significantly enhance knowledge commercialization efforts. University administrators should consider integrating entrepreneurship and innovation into curricula and providing students and faculty with the resources and support to pursue commercial ventures. Industry leaders, on the other hand, can leverage collaborations with universities and science and technology parks as a strategic approach to innovation, benefiting from access to cutting-edge research and emerging technologies. Establishing incubators and accelerators within science and technology parks can further facilitate the growth of start-ups and spin-offs, driving economic development and fostering a vibrant innovation ecosystem.

Authors' Contributions

All authors have contributed significantly to the research process and the development of the manuscript.

Declaration

In order to correct and improve the academic writing of our paper, we have used the language model ChatGPT.

Transparency Statement

Data are available for research purposes upon reasonable request to the corresponding author.

Acknowledgments

We would like to express our gratitude to all individuals helped us to do the project.

Declaration of Interest

The authors report no conflict of interest.

Funding

According to the authors, this article has no financial support.

Ethical Considerations

In this research, ethical standards including obtaining informed consent, ensuring privacy and confidentiality were observed.

References

AliAsghar, P., Arian, G., & Samira, N. (2010). Prioritization of Factors Affecting Knowledge Commercialization at Universities (Five Top Universities). *Journal of Entrepreneurship Development*, *3*(1), 35. https://www.magiran.com/paper/868553

Bandarian, R. (2009). Marketing and Commercialization of new Technologies: Stages, Facilitators, and Critical Success Factors. *Roshd -e- Fanavari*, *19*(5), 1-10. http://rimag.ricest.ac.ir/fa/Article/20176

Behbudi, D., & Amiri, B. (2010). The Long Run Relationship Between Knowledge Based Economy and Economic Growth in Iran. *Journal of Science and Technology Policy*, *2*(4), 23-33. https://jstp.nrisp.ac.ir/article_12794_741040725add81e63fafcbff9cf435d2.pdf

F., M. F., Niaz Azari, K., & Salehi, M. (2016). Presentation of Structural models for the commercialization of knowledge in Islamic Azad University. *Journal of Future Studies Management*, *26*(4), 17-27. https://www.magiran.com/paper/1721022

Oyo, B., Williams, D., & Barendsen, E. (2008). A System Dynamics Tool for Higher Education Funding and Quality Policy Analysis. https://www.researchgate.net/publication/242753790_A_System_Dynamics_Tool_for_Higher_Education_Funding_and_Quality_Policy_Analysis

Salamati, T., Vaezi, E., Memarpour, M., & Rajabzadeh, A. (2016). Commercialization Model Design and Presentation of Proposed Algorithm of Knowledge Commercialization for the Higher Education. *Knowledge Retrieval and Semantic Systems*, *3*(8), 61-80. https://doi.org/10.22054/jks.2017.22386.1134

Shafiei, M. (2013). Organizational Commitment in Knowledge base Startup Companies: the Team Coherence and Business Survival Factor in the Competitive Environment. *Roshd -e-Fanavari*, *34*(9), 1-10. http://rimag.ricest.ac.ir/fa/Article/20062

Spilling, O. R. (2004). Commercialization of knowledge–conceptual framework. 13th Nordic Conference on Small Business (NCSB) Research,

Talebi, K., Sanaee Pour, H., & Heidari, N. (2011). Explaining the Role of Science & Technology Parks in the Growth of the New Technology-Based Firms (NTBFs). *Journal of*

E-ISSN: 3041-8992

Entrepreneurship Development, *4*(1), 147. https://www.magiran.com/paper/937494

Wissema, J. G. (2009). *Towards the Third Generation University: Managing the University in Transition*. Edward Elgar. https://books.google.com/books?id=Vt0zmAEACAAJ

Wong, P. K., & Singh, A. (2014). A Preliminary Examination of the Relationship between Co-Publications with Industry and Technology Commercialization Output of Academics: The Case of the National University of Singapore. *STI 2014 Leiden*, 702. https://www.academia.edu/download/46944863/Methodological_Proposal_for_Evaluating.pdf#page=714

Yadollahi Farsi, J., Zali, M. R., & Bagherifard, S. M. (2011). Recognizing Affective Structural Factors on Developing Academic Entrepreneurship; The Case of University of Applied Science and Technology. *Journal of Science and Technology Policy*, *4*(1), 17-33. https://jstp.nrisp.ac.ir/article_12833_f4685922c3fcc39e8dd3727cc1649f72.pdf

E-ISSN: 3041-8992