

Identification of Effective Factors on Knowledge Commercialization in Universities

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Abstract The purpose of this study is identification of effective factors on knowledge commercialization in universities. The research method in terms of purpose is applied and type of study is descriptive-correlation and studies which combine qualitative and quantitative methods) mixed methods study (. In qualitative section, semi-structured interviews with the use of expert opinion were conducted and make a questionnaire based on the results analysis of the content of interview. And lead to 87 index for knowledge commercialization. With Exploratory factor analysis and variance effective factors and matrix rotated factors, 5 factors that affecting the knowledge commercialization was identified. Factors include: external factors, intellectual capital, knowledge creation, intersectional collaboration, strategic orientation. Factors and identified indicators to the method of structural equations and partial least squares (PLS) were analyzed. And after determining the weight of each factor, the impact dimensions and components on knowledge commercialization were examined. Results showed that there is positive significant relationship between external factors, intellectual capital, knowledge creation, instructional collaboration, strategic orientation with the commercialization of knowledge.

Keywords: knowledge commercialization, strategic orientation, intellectual capital, knowledge creation, intersectional collaboration

Introduction

The growing global competition, opportunity of fundamental and basic research has taken from many industries, so most companies forced to just carry out the required and critical research. Research In today's world, the economic factor has converted. Transitions From pure science are done and scientific and research institutions should be clearly at the service of economy and trade.

Commercialization, is create technology product, service or new process to meet the new demand and fix it requires continuous efforts for the transforming the results to new products and services and successful marketing. Universities, specifically major research universities, played a key role in national and regional economic development. The Important way to help the University to achieve economic growth can be converted of scientific inventions to innovations via legal right Patents and licensing From Research results noted.

The Bayh–Dole Act or Patent and Trademark Law Amendments Act was

passed in the 1980s suggests That universities have the legal right to patent From research with public funds, and contribute in technology transfer for industry and commercialization of research (Wu et al., 2015). Knowledge is based on economic development And universities have, developer role in the development of the knowledge economy via commercialization activities in scientific knowledge. Scientific knowledge can be transferred to the market in different ways: education and training, research contracts, industrial consulting, licensing, Spin off, joint cooperation via Spin off, and research associate (Boehm& Hogan, 2013).

Despite the economic and social roles, third missions focused on company activities and especially on business partnerships and licensing and its emphasis on strengthening Entrepreneurship in college (Nelles & Vorley, 2010). Results and outcomes research until don't convert to practice it can't benefits for society and public welfare and national wealth.

Commercialization and transfer of research findings to industry and the marketing is one of the most complex stages the innovation process. Commercialization of research and knowledge production activity is inevitable for compensate the costs Research and development public and private universities and research centers. And can develop country and play a vital role in all industries, especially high-tech industries.

Generally, the main management challenges of owners and investors knowledge, is How converted your new knowledge to the production and economic efficiency for institutions, investors and employees. In other words, the real problem is not patent but its commercialization.

Continuity the cycle of conversion of knowledge to wealth include the discovery of natural law, the formation of practical ideas based on scientific observations or natural needs, promoting the idea into technology, develop ideas and convert them into processes or products, production competitiveness and economic and finally, entry into financial and business cycles. The cycle That is all stages associated with the production of information and knowledge (Yadollahi farsi & Kalathaie, 2011).

Commercialization process of academic research and technology is Means, Presentation of scientific findings and research students in universities and educational institutions to the public and society. This process will be executive in the relationship between the university and industry and is ready for operation. Which in addition to providing significant economic value for universities, research organizations, also lead to economic growth and increased technical and economic welfare. This issue is important especially in private research

organizations. Because without access to certain clients an achievement, production or experiment about one idea would be useless (Mosaie, 2008).

Studies in the area of knowledge commercialization showed that multiple factors influence it such as intersectional collaboration, knowledge creation, innovation orientation, market orientation, network-oriented, entrepreneurial culture, academic, intellectual capital, and the ability knowledge commercialization.

Intersectional collaboration that is members of the team holding the same position, but different fields, to perform a certain task were worked (Lin et al., 2015). Knowledge creation that is the ability of a company as a whole in the creation of knowledge, its distribution across the organization and its embedding in products, services and systems (Yang, Fang and Lin, 2010).

The innovation orientation, referring to be free in Presentation of new ideas Along with following these ideas in two fields technical and managerial company's (Dhewanto & Sohal, 2014).

Market orientation that is The Company's business strategy which is oriented enough to hidden and apparent needs Customer and creates more value for them continuously (Mu & Di Benedetto, 2011).

Networking means focuses on company's business strategy, effective position of network partners, Management network connections and improve network performance (Mu & Di Benedetto, 2011).

Academic entrepreneurial culture that is orientation of knowledge-based companies to experience new approaches and by new resources, innovate and create new products (Lee and Lee, 2014).

Intellectual Capital, is Collection of knowledge-based assets that are specific to an organization and its characteristics are considered by adding value to key stakeholders of the organization, and leads

to significantly improve the competitive position of the organization (Mar, 2004). Ability to commercialization of knowledge that is ability to convert research results into products, services and processes that can be targeted business developments (Lee and Morgan, 2010).

These days knowledge commercialization was become an undeniable necessity. Meanwhile, Iranian universities have not yet ideally, to commercialize their knowledge.

University of third generation entrepreneur is Create value and wealth. The order of wealth, is not Just material wealth and economic. Wealth is more than money and can be create social wealth; culture and politics, such as the promotion of knowledge, intellectual capital, the effective use of human resources, and conservation of natural resources. All these are in line with the correct and appropriate use from results of research and the university. The third generation of university graduates should be Employed knowledge with applied research and create of wealth with innovation and impact on the industry and market environment and entrepreneurial business, value creation.

In this study, we try to use appropriate methods to identify factors influencing the commercialization of knowledge and by analyzing the different mentalities of different people on these issues be examined.

Methodology

The research method in terms of purpose is applied and type of study is descriptive-correlation and studies which combine qualitative and quantitative methods) mixed methods study (.in terms of type of data, mixed exploratory method. in terms of time is cross-sectional study.

Statistical sample

A: The qualitative part: academic experts

and professionals who had executive records the macro level decision-making and the so-called elites are known. To determine samples this research and determination of this group of experts, Judgmental sampling method was used. In this study, 10 samples were considered to be interviewed

B. The quantities part:

The statistical population included of 2207 faculty members of Tehran's Azad University. Sampling method is Cluster sampling method. For determine the sample size Using Morgan table and were selected 327 people.

Instrument

A: The qualitative part: in the qualitative part of the study, semi-structured interviews were used. In individual interviews with respondents, was used for the initial six interview questions. While the other subsidiary questions Also next to each question to understand the experiences of participants was raised during the interview. Researcher in the process of sampling of the participants, the data was analyzed. So case was incomplete with received new information from the new entrant will be complete. After 10 interviews, main and secondary Factors Was repeated in previous interviews

and researchers were saturated. During interviews to collect opinions on the appropriate indicators to determine predictive factors on talent management was investigated and main and secondary Factors were evaluated and finalized.

(B) The quantitative part: in the quantitative phase of research, criteria Extracted from The qualitative phase were investigated to design a questionnaire. In fact, of research questionnaire based on standard questionnaires And the results of the qualitative study was developed. This questionnaire consisted of 109 items of packaging and five-item Likert.

Information on the questionnaire can be seen in Table 1.

Validity and reliability

A: qualitative: To ensure the validity qualitative research and to assure accuracy of the findings from the perspective of researchers, we used Valuable comments and faculty professors and experts in the field Also, at the same time, participants in the analysis and interpretation of the data was used.

B. quantitative: Validity of the questionnaire was confirmed by experts in the field. In addition to the structural validity, from two criteria of Convergent and divergent validity were used, which Specific structural equation modeling with approach by PLS. also in this study to determine the reliability of the data collection used Cronbach's alpha By Spss software and the composite reliability which is calculated by the software Smart PLS.

The values of these coefficients for all

variables were above 0.7 which indicates adequate reliability of the questionnaire. The average variance extracted values, Combining reliability and Cronbach's alpha coefficients in Table 1 is visible.

Data analysis method

A: qualitative: For qualitative data analysis of research from content analysis was used.

In this study gathered qualitative data analysis, via open coding and axial coding is done.

B. quantitative: According to research questions in the quantitative section Descriptive and inferential statistical methods were used. In the descriptive part the mean and standard deviation of each variable is presented. In Section inferential analysis research questions Using correlation coefficient, structural equation modeling (exploratory factor analysis and confirmatory factor analysis), Friedman and Kolmogorov - Smirnov and using SPSS software and PLS Smart.

Table 1. Information on research questionnaires

Dimension	Component	Question Number	Number of questions
1 Intersectional collaboration	Collaborative relationships	1-5	5
	Collaborative leadership	6-10	5
	Communication and information sharing	11-14	4
		15-19	5
	Trust formation		
2 Knowledge creation	socialize	20-23	4
	Withdrawal	24-27	4
	Compound	28-31	4
	Internalization	32-35	4
3 Strategic Orientation	The innovation orientation	36-39	4
	Market orientation	40-45	14
	Networking	46-59	6
	Academic entrepreneurial culture	60-64	5
4 Intellectual Capital	Human Capital	65-69	5
	Social capital	70-74	5
	Organizational capital	75-78	4
5 Ability commercialization of knowledge	Commercialization speed	79-83	5
	Market area	84-87	4
	Breadth of technology	88-92	5
	The novelty of the new product	93-97	6
6 External organizational Factors	Market demand	98-102	5
	Cooperation with industry	103-109	7

Results

In this section, the question of research using scientific methods investigated and evaluated. According to the table 2, there is a significant positive correlation between intersectional collaboration, knowledge creation, strategic orientation, intellectual capital, knowledge Commercialization Ability, and External organizational Factors with Commercialization knowledge.

Tables shared values indicators, variance matrix effective factors and rotated Factors for each of the dimensions affecting the Commercialization knowledge were examined and finally the results of the qualitative and exploratory factor analysis the dimensions and components that affect the Commercialization knowledge in the table 3.

-which model can be detected to determine their role on Commercialization knowledge in the Islamic Azad University in Tehran?

Analysis the model using confirmatory factor analysis (method of path analysis) and software Smart PLS 2 described above. The Figure below shows the model implemented based on standardized coefficients.

According to the results in the figure 1, intersectional collaboration, knowledge creation, intellectual capital, strategic orientation and external factors are able to analyze the Commercialization knowledge by 64%.

Also in Figure 2, the model is presented based on t-statistic values, values more than 1.96 for this test, confirmed the efficacy between the two variables. Also according to Figure 2, intersectional collaboration and creation of knowledge, intellectual capital, knowledge, capabilities and external factors on Commercialization knowledge was confirmed.

Is an identified factor influencing the commercialization of knowledge influence on commercialization?

Table 2. The mean, standard deviation, coefficient of reliability, AVE and the correlation coefficient between the variables

Structures	average	SD	Cronbach's alpha	Reliability coefficient combined	AVE	1	2	3	4	5	6	7
Intersectional collaboration	3.569	0.511	0.899	0.929	0.767	1.000						
Knowledge creation	3.494	0.566	0.804	0.873	0.635	0.576	1.000					
Strategic Orientation	3.533	0.558	0.795	0.858	0.520	0.661	0.567	1.000				
Intellectual Capital	3.461	0.550	0.836	0.879	0.520	0.752	0.549	0.624	1.000			
Ability commercialization of knowledge	3.488	0.594	0.849	0.909	0.769	0.504	0.566	0.586	0.517	1.000		
External organizational Factors	3.796	0.488	0.867	0.909	0.715	0.683	0.699	0.741	0.747	0.617	1.000	
Commercialization on knowledge	3.494	0.566	0.837	0.879	0.519	0.699	0.743	0.747	0.617	0.632	0.741	1.000

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Commercialization knowledge	3.494	0.566	0.837	0.879	0.519	0.699	0.743	0.747	0.617	0.632	0.741	1.000

Table 3 .the dimensions and components identified effective on commercialization of knowledge

Dimensions	Intersectional collaboration	Knowledge creation	Strategic Orientation	Intellectual Capital	Ability commercialization of knowledge	External organizational Factors
Components	Collaborative relationships Collaborative leadership Communication and information sharing Trust formation	socialize Withdrawal Compound Internalization	The innovation orientation Market orientation Networking Academic entrepreneurial culture	Human Capital Social capital Organizational capital	Speed commercial-of Market area Breadth of technology The novelty of the new product	Market demand Cooperation with industry

Table 4. The results of the research model

	Effects investigated	Standardized coefficients	T value	Approval / rejection	total effects
1	The impact of intersectional collaboration on commercialization	0.128	2.545	Approval	0.254
2	The impact of knowledge creation on commercialization	0.220	1.971	Approval	0.222
3	The impact of intellectual capital on the commercialization	0.149	2.198	Approval	0.265
4	Ability commercialization of knowledge	0.299	4.127	Approval	0.294
5	The impact of strategic orientation on commercialization	0.333	4.788	Approval	0.343
6	The impact of external organizational factors on commercialization	0.192	3.790	Approval	0.178
7	Commercialization potential impact on the commercial performance	0.397	4.851	Approval	0.398

Discussion and Conclusion

The purpose of this study is to Identification of effective factors on knowledge commercialization in universities. The result showed that a collection of internal organizational (Intersectional collaboration, Knowledge creation, Strategic Orientation, Intellectual Capital, Ability commercialization of knowledge, External organizational Factors) and external organizational factors that affect the commercialization of knowledge. Intersectional collaboration The Company able to reached a consensus and improves the effectiveness of new product development. Of course, in intersectional collaboration, special training for managers to coordinate the complex process of product development with a variety of people is required.

Intellectual Capital at the University of high Ability for the commercialization of knowledge So that human capital, organizational, social, emphasis on education, preservation and development of human resources, the quality of work and life and operational knowledge as a decisive lead to the commercialization of knowledge. Academic entrepreneurial culture, promotes innovation orientation at the university and the result is innovation. But it should be noted until the university

does not have a strategic approach to commercialization to obtain financing these factors cannot have a significant role in the commercialization of knowledge. The results of this study Is consisted with the results Damari et al. (2013); Lin et al (2015); MU and Di Benedetto (2011); Rezvani and Toghraie (2011); Dovanto and Sohal (2014).

Suggestion

1. University policy, paying particular attention to intersectional collaboration at the University According to their networking Such as improving communication between medical specialists and provides interdisciplinary fields of scientific innovation.

2. University presidents for commercialization in the university should be more attention to the intellectual capital with upgrade Intersectional cooperation. In fact, the commercialization of knowledge, human capital and operational knowledge is needs to train, retain and develop human resources and attention to quality of work life.

3. In relation to organizational factors the policy makers suggested the Through improving the relationship between industry and university centers, Networking between industry and university reduce environmental

uncertainty, and Provide More Communications And by granting low-interest loans And facilitate the processes of commercial law at the University of improving their knowledge.

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