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**INVESTIGATING THE RELATIONSHIP BETWEEN INFORMATION TECHNOLOGY
AND CORPORATE ENTREPRENEURSHIP WITH THE ROLE OF INTELLECTUAL
CAPITAL**

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ABSTRACT

In this study, an attempt has been made to examine the relationship between IT and Corporate entrepreneurship according to the role of intellectual capital. The present research is an applied research and according to research methodology is considered as a descriptive, investigative and correlational research. Population of the study, include all technical colleges staffs of Golestan province about 350 persons, of which, 185 were selected as the sample with the help of Morgan's table for determining the sample size. In order to choose the appropriate sample, random sampling method has been used. In order to collect data field and library methods has been used with questionnaire. For analyzing the data we used descriptive and illative statistic's methods which for performing factor analysis, the SPSS software and for analyzing hypothesizes of research with the structural equation method, the PLS software has been used. Results of the research shows that the selected models have been confirmed according to the load factor and significant numbers, and all the direct relations between variables of the model also were significant. Also findings of the research shows that all of hypothesizes are meaningful.

INTRODUCTION

The use of information technology helps to increase knowledge and awareness of staff and enrich the content of jobs. Making use of IT is a helpful way in business performance in economic. The IT has been changed the business methods. The IT in the environmental fast changing era plays a vital role in continued survival of the organizations. Nowadays with the help of IT and data fast processing the managers can control and coordinate much complicated structures and organs. In addition the IT causes that management and organization's performance, execute with faster reactions (otarkhani, 1387). The competency of the IT is important to the organizations, because it can encourage determining unique, valuable and inimitable resources (Bhatt and Grover, 2005). Further the competitive environment of the business become more intensive day to day. In the past decade fast and vast changes have happened in politic, economic, industry, technology and trade and now they are changing too. The rate of these changes Increases due to changing in technology, free activity, affinity of world marketing, increasing in innovations, decreasing in life cycle of products and reduction of time and location distances. As a result

organizations have been faced with markets which intensive competition and increasing new requirements of the customers considered as their unique characteristics. Nowadays companies in addition to determine strategies in order to attract new clients and do dealing with them, they attempt to keep their present clients and make a permanent relation to them. In other words companies attempt to gain customer's life time value (Takala and Uusitalo, 1996). For improving the quality of information's and fast reaction against changes in today competitive environment electronic business generally use different information's systems in order to connect internal value chains of organization with outside trading activities of organization (eze, 2008).

Literature and History of the research

Nowadays it has been cleared that information and communications are two important powers. These items are both valuable and making values. Someone who knows about different markets and their products prices or be aware about history and future of the market can choose better decisions in order to gain more profit. In addition to their natural value, Information's have another feature which is led to science

and cause to make better decision. Like information's, communications are considered valuable too and according to their size and type create added values. Information's and communications are two essential items for any entrepreneurship activity. Entrepreneurship without any support from institutes, organizations and mans is impossible. Entrepreneurship requires discovering a social need and discovering social needs relates to social recognition, its needs and its cultural and economic and social context. In order to identify the need of any entrepreneurship activity the theorist must have insight toward the environment and knows that what solutions have been presented for that need in different parts of the world. So, like communications science and information's are essential items for any entrepreneurship activity (feyz and colleagues). Bhatt and Grover believe that IT competency is important to an organization because it can encourage identifying the unique, valuable and inimitable resources. They have classified the IT competency into 4 general features which consist of:

A) IT in communications, relates to anything which is directly involved in exchange of information's and

includes some items like: Email, Fax, Telephone, access to the Internet.

- B) IT in production and operation, acts as an umbrella which comprises vast domain of computers technologies in order to direct and indirect support, controlling, discovering and monitoring on productive and operative activities
- C) IT in supporting the decisions, points to the application of IT in supporting managers in decision's mechanism and consists of decision's supporting system, data analysis technics and forecasting software.
- D) IT in administrative and financial affairs, points to the applications of IT to help administrative and official activities, like: organizational documentsand organizing and data storage. On the other hand intellectual capital is a collection of science, informations, intellectual capitals, experience, competition and Organizational Learning that can be used to create wealth. Actually intellectual capital of all staffs includes Organizational science and its abilities to create added value and leads to continuous competitive

benefits (Ghelich lee and Moshbaki, 1385). Sherer and colleagues (2003) in their research IT is considered as one of the organizational changing items toward Entrepreneurship and manager support from IT, staffs capability and on time information presentation have taken into consideration. Hayton (2005) in a research with a title of competition in new economic: the effect of social capital on Corporate Entrepreneurship mentioned that intellectual capital is a unique asset of competitive advantage which is caused to facilitate Entrepreneurship by risk reduction and output investment increase in innovation. Jordi Vilaseca (2007) in research which was performed in Spain on 2038 staffs, concludes that there is a positive relationship between the use of IT and communications with improvement of processes related to innovation in organization. Also this research showed that organizations which uses IT and appropriate communications in addition to

have suitable internal and external communications, group activities and innovation processes perform in an Entrepreneurship manner. Osuna and Gerardo (2008) in a research with the title of investigating the role of IT as an intellectual capital in educational products say that the IT has been considered as an opportunity in order to develop intellectual capitals.

Conceptual Model of the research

According to the history of the research and its literature variables have been selected as we see below:

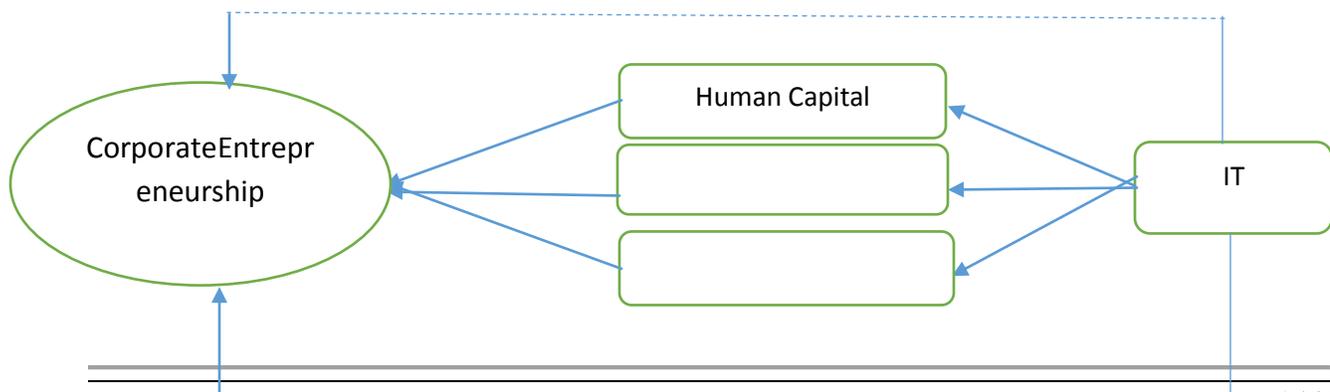
IT variable from the model of Martinz Lorente and colleagues (2004)

Features of intellectual capital consist of man capital, structural capital, and communicative capital from model of Bontis (2000)

Corporate Entrepreneurship variable from Ozdemirsi model (2011)

Conceptual model have been adopted from research of Akbari and colleagues (1391)

Conceptual Model of the research (Akbari and colleagues, 1391)



Research hypothesis

As regards Corporate Entrepreneurship is an attitude involves organization in activities which successfully identifies opportunities and invest on them therefore paying special attention to the IT and communications in organizations structure for identifying Entrepreneurship chances, accounts for one of the important factors in persistence, growth and development of the organizations. In spite of the importance of the Corporate Entrepreneurship and importance that the role of IT and communications can have in access to Entrepreneurial purposes in modern organizations especially in technical colleges, few researches have been executed in field of the effect of this technologies on incidence and development of the Corporate Entrepreneurship. This research has been done with the purpose of surveying the effect of IT and communications on Entrepreneurship according to the role of the features of the intellectual capital. Therefore Research hypothesis includes:

H₁: surveying and explaining the relationship between the IT and Human Capital

H₂: surveying and explaining the relationship between the IT and Structural capital

H₃: surveying and explaining the relationship between the IT and customer capital

H₄: surveying and explaining the relationship between the Human Capital and Corporate Entrepreneurship

H₅: surveying and explaining the relationship between the Structural capital and Corporate Entrepreneurship

H₆: surveying and explaining the relationship between the Communicative capital and Corporate Entrepreneurship

H₇: surveying and explaining the relationship between the IT and Corporate Entrepreneurship

H₈: surveying and explaining the relationship between the IT and Corporate Entrepreneurship according to the mediator role of the dimensions of intellectual capital.

Variables of the research consider as independent variable according to Research hypothesis and IT and Corporate Entrepreneurship exist as a dependent variable and dimensions of intellectual capital consist of Human Capital, Structural capital and Communicative capital as a mediator variable.

Method of the research

The present research is an applied research and according to research methodology is considered as a descriptive, investigative and correlational research. Population of the study, include all technical colleges staffs of

Golestan province about 350 persons, of which, 185 were selected as the sample with the help of Morgan's table and Cerjecie's table for determining the sample size. Therefore according to the 350 persons as Population of the study, 185 persons extracted for creating the sample same as the table. In this research questionnaires stability have been confirmed by the method of α -crounbach. In the present research in order to analyze data and testing hypotheses, factor analysis and structural equation have been used and all the calculations have done by the SPSS and LISREL software.

Data analysis

Correlations of the research variables

According to the significant level ($\text{sig} < 0.01$) correlation rate between MacKinnon variables (hidden) has been shown below in the table. For example correlational rate between IT variable and human capital is 0.561 (**Table 1**).

Factor analysis

Factor analysis is one of the statistic methods uses in order to survey the relationship between MacKinnon variables and mentioned variables. In order to executing the factor

analysis, among the different ways to do this, can pointed to the method of calculating the amount of KMO, if the $\text{KMO} > 0.7$ then the existing correlation between data will be suitable for factor analysis. In the other hand the Bartlett's test has been used in order to make sure about the data that are appropriate based on the matrix of the correlations are used as the base of analysis, isn't equal to zero in the population (**Table 2**).

According to the KMO number (> 0.7) and significant number of Bartlett's test can say that the data are suitable for executing the factor analysis.

Table 3 of all the explained variance shows that these questions forms 5 factors and these factors explain and cover about 72.65% of the variance that actually indicates justifiability of the questions.

Research hypothesis test

In this part we are going to survey the research hypothesis test by the LISREL software.

Table 1: matrix of correlation between variables of the research

	IT	HC	SC	CC	EN
Pearson correlation	1				
IT sig. (2-tailed)					
N	185				

Pearson correlation HC sig. (2-tailed) N	.561** .000 185	1 185			
Pearson correlation SC sig. (2-tailed) N	.578** .000 185	.346** .000 185	1 185		
Pearson correlation CC sig. (2-tailed) N	.666** .000 185	.355** .000 185	.325** .000 185	1 185	
Pearson correlation EN sig. (2-tailed) N	.608** .000 185	.551** .000 185	.482** .000 185	.439** .000 185	1 185

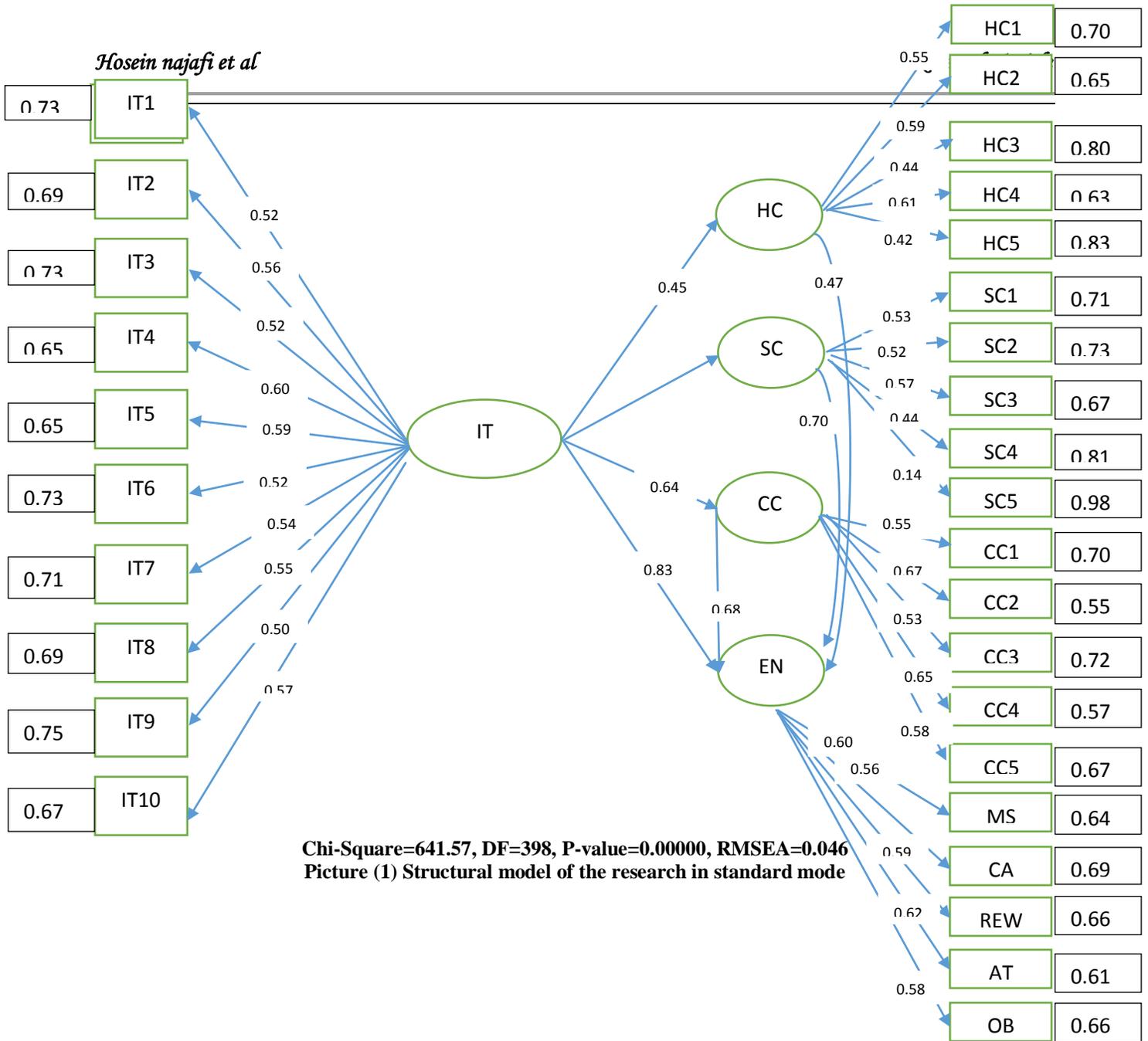
**correlation is significant at the 0.01 level (2-tailed)

Table 2: KMO and Bartlett's test

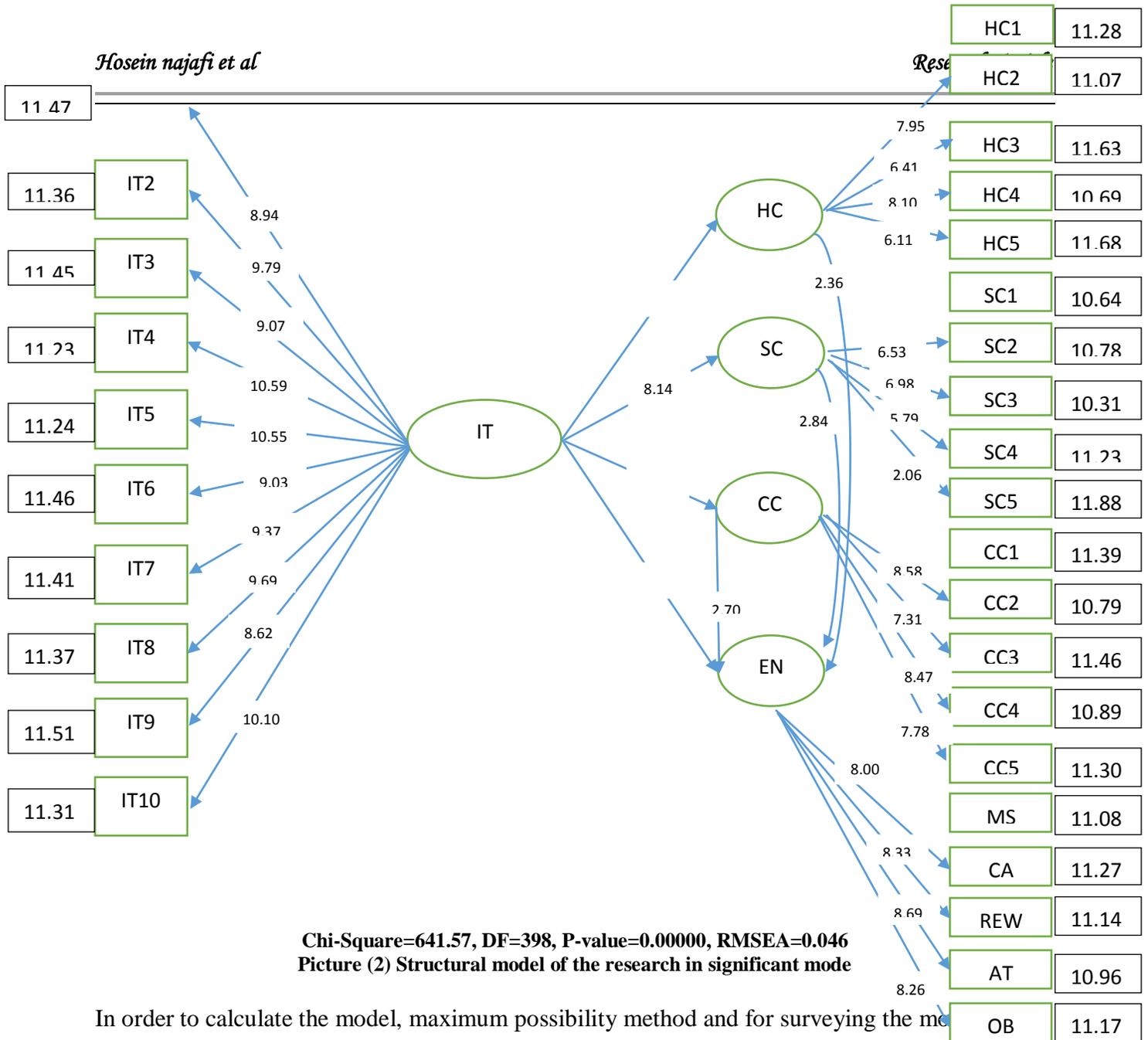
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.	.858
Bartlett's Test of Sphericity Approx. Chi-square	8031.622
Df	561
Sig.	.000

Table 3: Explained Variance

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	16.876	49.635	49.635	16.876	49.635	49.635	8.097	23.815	23.815
2	2.392	7.036	56.671	2.392	7.036	56.671	5.854	17.218	41.033
3	2.194	6.452	63.123	2.194	6.452	63.123	4.648	13.671	54.704
4	1.791	5.266	68.390	1.791	5.266	68.390	3.986	11.725	66.429
5	1.658	4.875	75.265	1.658	4.875	75.265	2.324	6.836	75.265
6	1.092	3.213	76.478						
7	1.053	3.098	79.575						
8	.908	2.670	82.246						
9	.730	2.147	84.393						
10	.669	1.967	86.360						
11	.629	1.851	88.211						
12	.592	1.740	89.951						
13	.471	1.385	91.336						
14	.436	1.282	92.619						
15	.404	1.188	93.806						
16	.284	.836	94.642						
17	.261	.767	95.409						
18	.233	.687	96.096						
19	.203	.598	96.693						
20	.188	.552	97.246						
21	.155	.457	97.702						
22	.141	.414	98.116						
23	.118	.347	98.463						
24	.102	.301	98.765						
25	.098	.288	99.053						
26	.075	.219	99.272						
27	.056	.166	99.438						
28	.049	.144	99.581						
29	.042	.125	99.706						
30	.026	.076	99.782						
31	.022	.065	99.847						
32	.019	.057	99.904						
33	.018	.052	99.956						
34	.015	.044	100.000						



Chi-Square=641.57, DF=398, P-value=0.00000, RMSEA=0.046
 Picture (1) Structural model of the research in standard mode



In order to calculate the model, maximum possibility method and for surveying the model fit indexes like $(\frac{x^2}{df})$, Comparative fitting index (CFI), GFI, AGFI, NFI, NNFI and the RMSEA was used.

The following table shows the pathway coefficients and meaningfulness between variables of the research. As you see pathway coefficients have obtained significant in 0.05 level ($t > 1.96$) for all of the seven relations.

Table 6: Results of the direct relation and significant coefficients of hypothesis of the model

Pathway	index	Pathway coefficient	Significant	Test result
Information Technology ---- Human Capital	IT ---- HC	0.45	5.82	OK

Information Technology ---- Structural Capital	IT ----SC	0.85	8.14	OK
Information Technology ---- Communicative Capital	IT----CC	0.64	7.37	OK
Human Capital ----- Corporate Entrepreneurship	HC-----EN	0.47	2.36	OK
Structural Capital ---- Corporate Entrepreneurship	SC-----EN	0.70	2.84	OK
Communicative Capital ----- Corporate Entrepreneurship	CC-----EN	0.68	2.70	OK
Information Technology ---- Corporate Entrepreneurship	IT-----EN	0.83	5.78	OK

In all of the assumptions as the amount of “t” has obtained more than 1.96 (significant threshold) so assumptions of the research are confirmed.

CONCLUSION

In this study, an attempt has been made to examine the relationship between IT and Corporate entrepreneurship according to the mediator role of intellectual capital in technical colleges of the Golestan province. In this regard for testing hypothesis of the research, structural modeling has been used. According to the results there is significant relationship between IT and dimensions of the intellectual capital. This result corresponds with the research of Akbari and colleagues (1391). Results of this research also correspond with the results of the researches of the Rezaeian and colleagues (2010), Osuna and Gerardo (2008). Rezaeian and colleagues (2010) in surveying the role of the intellectual capital and strategic Entrepreneurship in performance of organization with experimental evidences from small and moderate businesses in Iran expressed that there is a relationship between intellectual capital and strategies of Entrepreneurship with organizational performance. Nowadays

different countries are paid particular attention to economic Entrepreneurship and The entrepreneur in science of management and economy. Improvement of the Entrepreneurship and creating appropriate condition for its development are factors of countries economic growth particularly in developing countries. Entrepreneurship has a high level of importance in researches because most of the time it can act as a helper for countries, organizations and companies in this accelerated and wavy process (economic growth). As one of the main subcategories of the Entrepreneurship is Corporate Entrepreneurship without any doubt must say that Corporate Entrepreneurship has an impressive role in organization's successes. Many of the organization's policies which design in order to develop Entrepreneurship is related to IT. In the other hand attempts related to the Entrepreneurship in organization has become more effective and can increase competitive advantages and also improves general performance of company.

Therefore this research tried to evaluate the relationship between IT and intellectual capital and Corporate Entrepreneurship. According to the results there is significant relationship between dimensions of intellectual capital and Corporate Entrepreneurship. This result corresponds with the research of Akbari and colleagues (1391) and Negahdari and Maghsoudi (1389). And also corresponds with the results of Macerinskiene and Aleknavičiute (2011). They expressed that during the research with the purpose of evaluation the effect of intellectual capital on Entrepreneurship conclude that the intellectual capital and its features (SC, HC, and CC) have effect on tendency toward the Entrepreneurship. According to the results there is a significant relationship between IT and CE which corresponds with results of the researches of Feyz and colleagues (1392), Akbari and colleagues (1391), Alambeige and colleagues (1388).

The IT has created many changings in all of the social activities like Entrepreneurship and considered as the most important tool for modern Entrepreneurship. Entrepreneurship in IT has a wide area of acting. Entrepreneurship is requisite for technology development and technology development

creates suitable condition for Entrepreneurship. So based on this principle the importance of role of the creating suitable condition for Entrepreneurship and government task become clear. The government must develop and improve context of Entrepreneurship in IT domain and prepares the easy access of all to these networks. And also with applying technology in the one hand because of the increase in Efficiency, decrease the need for human force and on the other hand leads to diversity in activities and new jobs which creates occupation for human force. The jobs that can be evaluated, are classified into jobs based on informations and jobs based on industry informations. The first group called industry informations and the second industry technology.

SUGGESTIONS

For the future research and studying express some topics as follows:

1. This research performs on technical colleges of Golestan province, suggested to the researchers that perform a same research on other corporation
2. Suggested to survey the effect of IT an communications on CE in small and moderate organizations

3. Suggested to explain about the maturity level of IT processes on realizing the needs of business
4. Identify The effect of corporate and personal factors on CE
5. The effect of fava and social capital on tendency toward CE and investigating the relationship between intellectual capital and CE morality among students

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