

The Relationship between Intellectual Capital and Organizational Entrepreneurship (Case Study of Government Agencies in the City of Sanandaj)

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ABSTRACT

In the new economy, intellectual capital has been described as intangible assets which can be used as a source of sustainable competitive advantage. Leading organizations are those which create value by relying on intellectual capital. The development of entrepreneurship in today's organizations is one of the main goals of any organization to achieve sustainable growth and development. This experimental study investigated the influence of the three components of intellectual capital; in other words, human capital, structural capital and customer capital on corporate entrepreneurship in the public institutions of the city of Sanandaj. For exploration and development of the questionnaire items, Principal Component Analysis (PCA) and linear structural relations (LISREL) is used. The model's final estimates indicate a positive impact of each component of the intellectual capital on enterprise entrepreneurship.

KEYWORDS: Intellectual capital, human capital, structural capital, customer capital, entrepreneurship, linear structural relations (LISREL).

1. INTRODUCTION

Until early 1950, the main factor holding back developing countries was considered to be the lack of physical and financial capital. In terms of attitude, these countries resorted to different ways to earn money. This led to increased dependency and the destruction of the economic and political foundations of these countries. But today, it is clear that the injection of large amounts of physical and financial capital doesn't necessarily accelerate the development of these countries (Shojaei et al, 2011). In the new economy, generating wealth and economic growth stems mainly from intangible assets, especially intellectual capital. The development of the new economy emphasizes more on the fact that it depends more on intangible assets rather than physical assets. Therefore, in these economies, the main source of intellectual capital is the main source of economic development and other traditional factors of production such as land, labor and capital are important for the next fiscal position. In such circumstances, intellectual capital, and organizational performance is a key factor in promoting efficiency. The most important issue in the field of intellectual capital is the concept of how to understand, evaluate, and measure assets of this type. Such assessments can adopt appropriate practices and methods, and the development of national knowledge systems to facilitate all-round development (Shojaei et al, 2010). Intangible assets of an organization are intellectual capital and intellectual resources of the organization by turning them into new processes, products, and services to create value deals. The term "intellectual capital" by John Kenneth Galbraith was first introduced in 1969. Before this, Peter Drake used the term "knowledge worker" (Feiwal, 1975). Due to its intangible and dynamic nature, it is difficult to define the term intellectual capital. It is often synonymous with terms such intangible assets or knowledge assets (Guthrie et al, 1999). There is no comprehensive consensus about the nature of intellectual capital and several definitions have been proposed. Itami, one of the pioneers working on the term, defines it as intellectual capital assets such as knowledge, technical knowledge, customer information, trademarks and organizational culture that are measured in terms of the competitiveness of firms. Ross et al defines intellectual capital as processes, and assets all know that normally are not in balance. Their definition includes all intangible assets (trademarks and patents) that also cover modern accounting methods. Stewart sees it as intellectual capital, information, intellectual property and

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experience which are used to create wealth. Edvinson explains intellectual capital as practical experience, organizational technology, customer relationships and professional skills to achieve competitive advantage in the marketplace firms. Bontis views intellectual capital as individual and organizational knowledge that contributes to sustainable competitive advantage (Bontis, 2000). Another definition given by Pulic sees the organization as all employees and their ability to create value-added leading to success. In general, it is like the muscles. It will be lost if you do not use it (Cohen et al 1993). Many attempts to measure the value of knowledge in order to obtain the true value is. It is generally assumed that the higher and better use of knowledge has a major impact on organizational performance (Ross et al, 1997).

The main objective of the organization is to promote entrepreneurship in organizations. Accordingly, this study sought to answer this question is to what extent the components of intellectual capital and organizational entrepreneurship are related. Accordingly, it will be answered in the form of research goals. The main objective of this study was to identify components of intellectual capital and their impact on the entrepreneurial enterprise.

2 - Model and definition of variables

This study sought to examine the relationship between intellectual capital and entrepreneurship based on the size and components of the variables to be introduced.

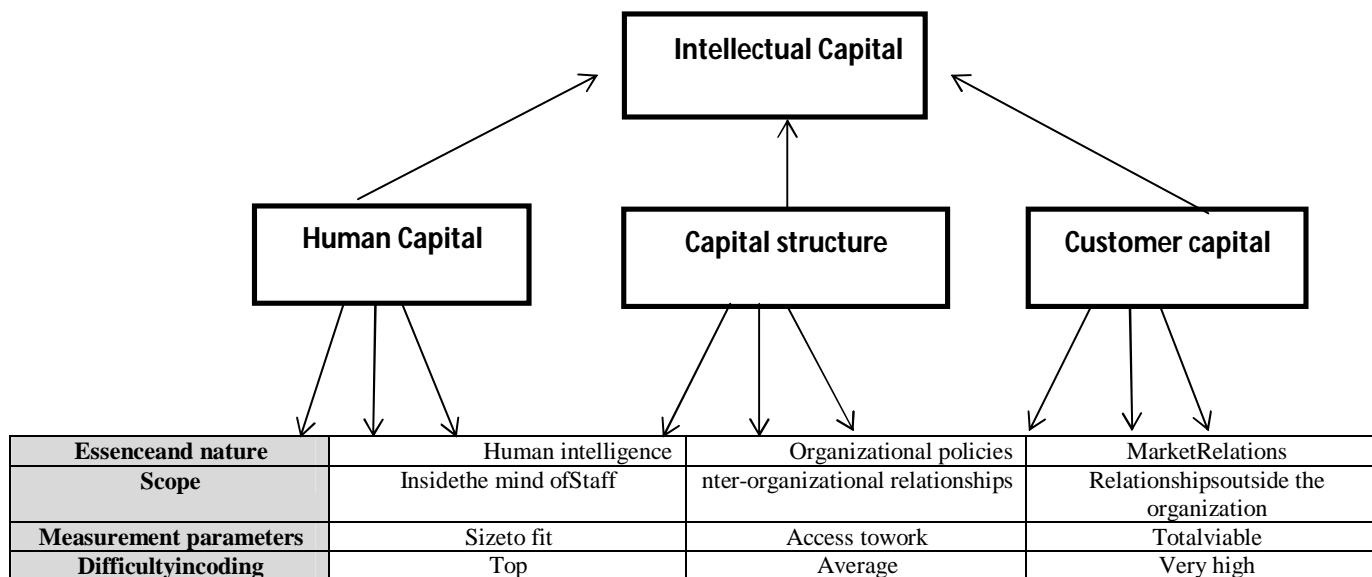
1-2 - Components of Intellectual Capital

In general, any intellectual capital is creating value defined by the intelligence and the human mind. Due to the complexity of the concept of intellectual capital, researchers who have worked in this field have offered their classifications. The first one was done by Asvyby in 1997 in three broad areas:

- Human capital - in the area of personal competence;
- Capital structure - in the area of the internal structure and
- Customer capital - in the area of the outer structure.

This classification has been adopted in most cases until later Bontis modified and extended it. He replaced the customer's capital investment and the four aspects of the essence and the nature, operating area, measurement parameters and difficulty in encoding. The classification by Bontis is similar to Figure. 1(Shojaei, 2009).

Figure 1: Components of Intellectual Capital



Source: Bontis(1998)

1-1-2- Human capital

Human capital describes the stocks of knowledge that is displayed by the staff (Bontis, 1998, Bontis et al, 2002), Ross et al relate intellectual capital created by the staff competencies to eligibility, methods and business acumen. Competencies include skills training and business acumen, as well as behavioral component involves working employees. Intellectual acumen enables employees to change work practices and innovations made in order to solve problems. Although employees are considered as the most important asset of the organization, the

organization may not own them (Ross et al, 1997). Edvinsson and Malone see human capital as combined knowledge, skills, creativity and ability to perform the duties of the employees. In this regard, the combination of genetic inheritance, training, experience and the meaning of life and business, form human capital (Hudson, 1993). Bontis sees human capital as capabilities in extracting the collective knowledge out of its members as the best solutions. Therefore, their departure can lead to loss of memory and thus can be considered a threat to the organization. But from another angle, because the staff is fresh, it can be considered helpful.

2-1-2 - structural capital

Structural capital consists of all non-human resources in an organization. Edvinsson and Malon see capital structure as hardware, software, databases, organizational structure, patent, trademarks and any other organizational capabilities that support employee productivity (Edvinson et al, 1997). Bontis introduces the capital structure as guidelines, strategies, policies, and anything that makes the organization more than its physical value (Bontis, 1999). Ross and colleagues see the capital structure as what remains after employees go to their homes (Ross et al, 1997). The findings show in an organization with poor styles and methods , intellectual capital cannot reach its potentials (Bontis, 1999).

3-1-2 – Customer’s Capital

Customer assets include both present value of relationships with customers and potential future value of these relationships. Due to the nature of the customer's investment knowledge, marketing channels and customer relationships are hidden in marketing canals. Thus, things like brands, market share, customer information, relationships with clients, access points and relationships with clients include commercial contracts (Bontis, 2000).

2-2 - Corporate Entrepreneurship

1-2-2 – internal Organizational factors.

The influence of corporate entrepreneurship on the success and performance of the organization's success has led to the studies on organizational factors (Zahra, 1991; Z. and Quinn, 1995). Findings of the research show that internal factors are particularly important in encouraging enterprise entrepreneurship (Burgelman, 1983, Quinn and Slevin, 1991). Researchers have sought to identify some of the key variables influencing corporate entrepreneurship such as reward and control policies (Hornsby et al, 2002), Farhang (Kanter, 1985; Hisrich and Peters, 1986), organizational structure (Quinn and Slevin, 1991; Naman and Slevin, 1993) and administrative support (Stevenson et al., 1985; Kuratko et al, 1993). These factors individually and in combination are seen as the first major corporate entrepreneurial efforts because they affect the internal environment and steps of entrepreneurial operations and support them to make a determination.

This study was conducted to identify the factors within the enterprise, numerous models and theories were reviewed and the McKenzie's model based on internal factors including the structure, strategy, staff, systems, management style, skills and values were studied. To investigate it in a broader and more detailed way, rather than the shared values, the culture will be studied. Also, to avoid interfering factors as indicators of employee skills and operating personnel are reviewed in the form of a factor. In this connection, several other models were examined, including Weisbord Six-box Model, Stephen Robbins model, model by Dessler Gary McKenzie 7S model. Among the tested models, the model by McKenzie was a better known model. It is a management model which views the seven factors of organization with a holistic approach. Wholly, these factors identify operating method of an organization. Offered by Tom Peters and Robert Waterman in collaboration with Richard Pascale and Anthony Athos, all of whom were members of the Mackenzie consulting firm, the model was released in 1978. This model is an appropriate tool for understanding organizations and the focus on hardware aspects, and rational aspects of the organization's software plans (Recklies,2001). This model is more comprehensive than similar models in service organizations and is applicable selective factors which are consistent with the purposes of the present study (Hagshenas, 2001).

2.2.2 – external Organizational factors

As well as internal factors, external environmental factors also have a significant impact on the operations and performance of the organization. Zahra and O'Neill (1998) pointed out factors in the external environment and the interaction with the environment challenge managers in creative and innovative ways. Organization theory has long expressed exogenous changes leading to adjustments within the structure, strategy and operations processes and procedures (Thompson, 1965; Lawrence and Lorch, 1967). Contingency theorists claim that a relatively stable and predictable business environment of the 1950s and 1960s lead to the formation and development of large mechanical organization. These theorists suggest when the rate of environmental change increases, smaller and more flexible

structures appear to be more appropriate. Another point is that entrepreneurship is an effective strategic response to environmental perturbations (Ansoff, 1979; Burgelman, 1983, Miller, 1983).

In this study, due to the external variables of the model, Richard L. Daft' (2000) model was selected for further integration because it was more comprehensive. Richard Daft's model views the organization environment as an entity including all things outside the organization which the organization need to react to so as to survive and continue. The pattern shows ten factors as external variables making clear that the factors identified in the model are adjusted according to the requirements of government agencies in Iran. Therefore, using the Delphi techniques and visiting experts and professors and experts in the field of management and directors of a number of government agencies, the factors that are effective on Iranian government agencies were determined from very low to very high levels. Fifteen members of the group were asked to identify factors in the model of Richard Daft effective on government agencies in Iran from very low to very high levels. Based on the similar researches, the factors in the 5-member range had an average over 3 were considered as external factors influencing the Iranian government agencies; government, industry, technology, and cultural factors - social, market and economic sectors. In addition, in this study, in order to prevent overlapping factors, economic factors and market indicators were considered as a major factor. On external variables, other models and theories were not very comprehensive. For example, some researchers and scholars, have classified external environmental factors in four categories that include political factors, economic factors, technical factors and social and cultural factors (Johnson and Scholz, 1999, Goodman, 1995). Fred R. David has divided the external forces influencing organizations into five categories: economic forces, social forces - cultural, ecological, political, governmental, legal, technological forces and competitive forces. Hence, Richard Daft model, the external environmental factors, was diagnosed a more comprehensive model. The association of these factors with corporate entrepreneurship will be briefly reviewed(Hagshenas et al, 1386).

3 - Data collection and questionnaire structure

The field of survey research requires a mental map and a conceptual model in the form of an analytical instrument which are drawn for the variables and the relationships between them. For this study, a theoretical model conducted by Bontis, and Hagshenas et al. has been used. In this study, the following variables are defined:

The original version of Bontis questionnaire conducted in Canada and Malaysia, and the questionnaire by Hagshenas et al. were used. In order to use this questionnaire, the items were translated into Persian and adapted with Iran by replacing some words with more appropriate words. The revised questionnaire with 59 items covers the three dimensions of human capital, structural capital and consumer and encompasses both within the organization and outside the organization entrepreneurship.

Statistical population of this research was government organizations of Kurdistan province. Using random sampling, 179 Organizations were chosen as the sample. Data were collected by questionnaire at the beginning of a letter explaining the goals of the need for cooperation by answering the questionnaire and supplying the necessary data were expressed. The value of the data obtained from the questionnaires was explained to encourage the respondents to answer the questions.

Several questions were included concerning the descriptive information of the respondents such as gender, age, education and work history at the end of the letter. Compilation of answers was based on the five-degree Likert scale (scale range 1 for strongly disagree and 5 for quite agree) that was considered as one of the most common responses to the rise of comparative measurement. In this method, each item must be read and then rated their agreement with the content. To learn more about the structure of the questionnaire, a brief of questionnaire items has been presented in Table (1) and (2).

Table (1): dimensions and indicators of intellectual capital and how it is Human capital

Human Capital			
H1	Favorable conditions of work	H7	appropriate reward
H2	Promote knowledge	H8	ample opportunity for growth
H3	learn from customers	H9	following innovative ideas
H4	sharing ideas	H10	Adapting to market conditions
H5	proud to work in the company o	H11	offering innovative ideas
H6	consistency		
structural Capital			
S1	Favorable business climate	S8	Identifying new ideas
S2	Support the expansion of knowledge	S9	continuous improvement of services
S3	Managers develop appropriate relationships with others	S10	Improvement of the company through Information Technology
S4	Suitable options at work	S11	Improving quality through information technology

S5	Customers in the first place	S12	Better relationship between the organization and the environment
S6	Sponsoring innovative ideas	S13	Internet sale
S7	Pioneering in introducing new products		
Customer capital			
C1	General satisfaction of customer	C8	Being market-oriented
C2	Reducing the time of solving the problems of customers	C9	Meeting with customers
C3	Increasing share	C10	Increase in customer feedback data distribution
C4	More choices by customers	C11	Identifying target markets
C5	Long-standing relationship	C12	Investment on customer demands
C6	Retain high-value services	C13	To ensure ongoing customer relationships
C7	Customer loyalty	C14	Customer feedback

Source: Nemeç et al(2007), Bontis(2000)

Table (2): dimensions and indicators of entrepreneurship and how it is encoded

Entrepreneurship			
Internal Entrepreneurship		External Entrepreneurship	
EP1	Structure	EP7	Technology
EP2	Strategy	EP8	Economic section and the and market
EP3	Leadership style	EP9	Cultural – social section
EP4	Organizational culture	EP10	Government
EP5	Organizational systems	EP11	Related industry
EP6	Human power		

Source: Haghshenas and others, 2007

4 - Estimation of Model and Analysis

1-4 - reliability (trustworthiness)

Scale is valid if it is repeated in other cases to reach the same conclusion. Reliability coefficients range is from zero (no confidence) to 1 (complete trust) is. Reliability coefficient, which indicates how well the instrument measures the characteristics and specifications of stable and temporal variables . The reliability coefficient measuring tools are used in different ways. Among them are test - retest or retest, equivalent methods, techniques Kudr - Richard Sven and Cronbach's alpha. In this study, Cronbach's alpha is used to determine the reliability of the test method. The alpha reliability of the scale is much greater. According to the empirical rule, Alpha must be 7/0 or more in order to be considered. Table (3) gives the reliability of test results.

Table (3): reliability of test results cited

Variable	related questions	Chronbach
Human capital	H1 ...H11	0.845
Customer capital	C1 ...C11	0.801
Structural capital	S1 ...S14	0.705
Entrepreneurship	EP1 ...EP11	0.794

Source: (computations of the present research)

According to the table above, alpha for each of the three structures was more than 0.7 and this indicates the desirability of collecting data for an exploratory study.

2-4 - Structural Equation Modeling:

Structural equation modeling SEM is a powerful multivariate analysis technique in a family of multivariate regression and GLM general linear model is developed to be precise allowing the researcher to examine a set of regression equations. Analysis Structural equation modeling can be performed by two techniques: Structural analysis of covariance and linear structural relations LISREL and partial least squares PLS.

A comprehensive statistical approach to test hypotheses the structural equation model of relations between variables and the latent variables was offered . Measured variables are variables that can be directly observed and measured; these variables are observed variables, also called indicators or manifest variables. Latent variables are variables that are not directly observable and must be inferred from the measured variables, the variables measured by the covariance between two or more variables are shown. LISREL is a mixture of the two analysis techniques: factor analysis (measurement model), path analysis - applied regression analysis (structural model).

Measurement model tries to assess the relationships between variables and latent variables by identifying the latent variable constructs. This phase of the study is done through confirmatory factor analysis test done. Table 4 shows the results of the confirmatory factor analysis.

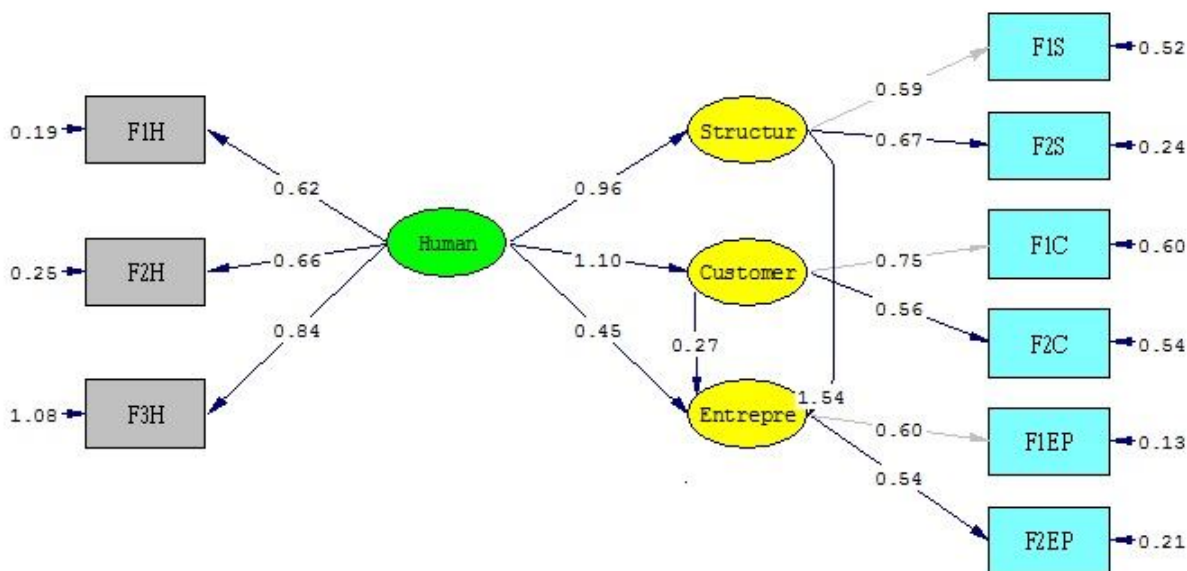
Table (4): Summary of Confirmatory Factor Analysis and indices

Hidden variables	Factor and item	RMSEA	P-value
Human capital	(3 factors, 11 items)	0.084	0.0011
Customer capital	(2 factors, 13 items)	0.072	0.001
Structural capital	(2 factors, 14 items)	0.056	0.0479
Entrepreneurship	(2 factors, 11 items)	0.047	0.000

Source:(Computations of the researcher)

The results of the measurement model estimates and t values indicate the coefficient is significant. We see that the results of the measurement model fully support the theory made in the exploratory factor analysis and can estimate the structural model research. The structural model is simply a causal relationship between the latent variables. In other words, this model aims to discover both direct and indirect effects of latent independent variables on the dependent latent variables. One of the advantages of latent variable structural equation model that is free of random error. Figure (2) shows a structural model that includes both variable components of intellectual capital and entrepreneurship research.

Figure (2): the structural model (path analysis)



Chi-Square=33.72, df=22, P-value=0.03238, RMSEA=0.025

Source: Calculations research

5 - Evaluation model:

In general, good indicators are fitted in two categories: comparative or comparative fit variances. As all the indices except one of them is between 0 and 1, the larger the index refers to better fit the criteria, so that the minimum criterion 90/0. LISREL Linear Structural Relations fitness major indices are in the second category and explain variances to examine the fitness of GFI, AGFI and the square root of the estimated variance of the error of approximation RMSEA modification.

$$GFI = 1 - \frac{\text{tr}\left\{\left[\Sigma^{-1}(S - \Sigma')\right]^2\right\}}{\text{tr}\left[\left(\Sigma^{-1}S\right)^2\right]} = 1 - \frac{F_t}{F_n} = 1 - \frac{F[S, \Sigma(\theta)]}{F[S, \Sigma(0)]} = 1 - \frac{\chi_t^2}{\chi_n^2}$$

$$R^2 = 1 - \frac{\sum e'^2}{\sum (y - \bar{y})^2} \tag{1}$$

The ratio between the estimated value and the true correlation matrix (the variance and covariance explained in S) measures the same as it is given. Proposed hypotheses or models to model the minimum numerator and denominator function model hypotheses is zero or null model, i.e. a model where there is no correlation between all parameters are zero. No significant test is for the index between zero (poor fit) and one (perfect fit) which does not vary. In this case, the index is closer to 1 the better the fit of the model to the data.

$$AGFI = 1 - \frac{df_n}{df_t}(1 - GFI) = 1 - \frac{n(n-1)}{2 \cdot df}(1 - GFI) = 1 - \frac{\chi_t^2/df_t}{\chi_n^2/df_n}$$

$$df_n = (1/2)[(p+q)(p+q+1)] \quad , \quad df_t = (1/2)[(p+q)(p+q+1)] - t$$

$$\bar{R}^2 = 1 - (1 - R^2) \frac{N-1}{df} \tag{2}$$

The index, which is the same as the adjusted degrees of freedom, where n is the number of latent variables exogenous and df degrees of freedom model. The closer this index is to 1 the better the fit of the model to the data.

$$RMSEA = \sqrt{\max\left\{\left(\frac{F(S, \Sigma(\theta))}{df} - \frac{1}{N-1}\right), 0\right\}} \tag{3}$$

The index difference between the models fit per degree of freedom where is the asseing fit of the model F and N is the total number of observations. Small values of this index indicate a good fit of the model so that the index equal to or less than good for models is 0/05 (from 0.05 to 0.08 Good, from 0.08 to 1 is very poor and more than 1 weak).To obtain optimal values for non-significant χ^2_{GOF} for all fitness indicators, the table (5) illustrates the estimation of suitability of this model.

Table (5): range of fit indices

Fitness index	Good fitness	Acceptable fitness	Calculated Amounts
χ^2	$0 \leq \chi^2 \leq 2df$	$2df \leq \chi^2 \leq 3df$	33.72
p value	$.05 \leq p \leq 1.00$	$.01 \leq p \leq .05$	0.03238
χ^2/df	$0 \leq \chi^2/df \leq 2$	$2 \leq \chi^2/df \leq 3$	1.5327
RMSEA	$0 \leq RMSEA \leq .05$	$.05 \leq RMSEA \leq .08$	0.025
GFI	$.95 \leq GFI \leq 1.00$	$.90 \leq GFI \leq .95$	0.87
AGFI	$.90 \leq AGFI \leq 1.00$	$.85 \leq AGFI \leq .90$	0.92

Source: (Hoyle, 1995; L. Mann, 1996).

According to the table, first four indicators can be easily observed. The numerical equivalent χ^2 is 33.72 while the degrees of freedom are connected with the 22 conditions and the range is a good fit. In addition the range is a good fit. Index values for the P-value, RMSEA, GFI and AGFI are also in acceptable range, or are in a good fit. It can be concluded that the model was a good model fit and its results are reliable, and can be used as evidence for more enquiries.

6 - Conclusions and Recommendations

Table 6 shows the estimation results of the structural model research. It is interesting to note that based on the proposed model in this study, as can be seen in the above figure, in addition to the direct effect, the indirect effect can also be observed.

For correct interpretation of the effects of variables, the ensemble which is the result of the direct and indirect effects should be considered.

Table (6): Results of path analysis (structural model)

Path As → To		Direct path (1)	Indirect path (2)	total Effect (2) + (1)
Human →	Entrepreneurship	0.61	0.44	0.46
		2.32	2.12	2.18
Structural →	Entrepreneurship	0.36	--	0.36
		7.22		7.22
Customer →	Entrepreneurship	0.29	--	0.29
		2.85		2.85

Note: The numbers in the top row shows the path values and bottom row numbers illustrates t values

Source: (Research computations)

Each of the following recommendations is provided to strengthen the human capital component:

- Identifying strategic jobs (identifying jobs that are tied to the organization's goals)
- Measuring the competence of employees and continuous improvement programs
- Job satisfaction is measured continuously at intervals and analyzing the information
- Take decisions based on the results of the analysis of this information to remove the obstacles to achieving job satisfaction
- Measurement at regular intervals of organizational learning
- Data analysis and comparison of the measurement of organizational learning and action learning standards, such as reward and punishment
- Preparation for careers, career paths and succession tables
- Using the information to improve their performance
- Providing training, consulting and organizational opportunities to help improve future employees with appropriate learning level.

To strengthen the capital structure of each of the components, the following recommendations are offered:

- Documenting the process of identifying and applying best practices and international competitors
- Use of advanced and modern structures like structures and project teams in different parts of the organization
- Using information systems that make it easy to access to information.
- Research and development budget and more time to practice and communicate and collaborate with academic references and experiences of domestic and foreign competitors
- Using feedback for Customer Reviews.

Following recommendations are offered to strengthen the capital components:

- Identify those key processes that have the greatest value for customers
- Conduct training for customers to employees who have direct contact with customers
- To identify customers' needs
- Distribution of customer feedback across the organization
- Import Customer Reviews on how to design and deliver services.
- Strengthen customer attitudes among all members
- Recruit, train, motivate and empower employees so that they can fully serve their customers
- Continuous follow up and timely response to customer expectations and complaints
- Expectations of customers
- Analyze customer feedback and action based on the findings
- Conduct training to employees when dealing with customers

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