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RESEARCH ARTICLE

# Designing an Intellectual Capital Model in Health Research Institutes of Academic Center for Education, Culture and Research

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## ABSTRACT

**Introduction:** In the important critical and vital healthcare sector, management of intellectual capital and examining its performance can play a significant role in advancing the goals of such organizations. Thus, this study aims to design a model of intellectual capital in healthcare research centers.

**Methods:** The present study is applied in terms of research results and outcomes, combined (qualitative and quantitative) in terms of the implementation process, descriptive-analytical and exploratory in terms of aim, and cross-sectional in terms of time. The research tool was a questionnaire. The study's statistical population consisted of faculty members and research experts of 8 healthcare research centers of Academic Center for Education, Culture and Research (ACECR) of Tehran. The sample size was determined to be 305 people based on Cochran's formula and the two-stage stratified sampling method. Based on literature review, the intellectual capital questionnaire was designed with 63 questions in the form of Likert scale. Content validity coefficient (CVR) and content validity index (CVI) were evaluated based on expert opinions, and 16 questions were excluded. Cronbach's alpha coefficient of the variables was also estimated to be higher than 0.7, which indicates the confirmation of reliability. To determine the effective factors, exploratory factor analysis was performed, and the model fit was examined by confirmatory factor analysis. SPSS23 and PLS3 software were the analysis tools.

**Results:** Results revealed that the significance level of human, relational and structural coefficients on the measurement of the final variable was significant at the level of 95%. Therefore, the above variables measured intellectual capital well. The relational variable with a coefficient of 0.943 had the highest impact, and the structural variable with a coefficient of 0.882 had the lowest weight and impact. The GOF index value for the general model fit was equal to 0.535, confirming the good fit of the proposed model.

**Conclusion:** To achieve the production of applied knowledge and to take advantage of the maximum capacities and capabilities of research institutes in the era of knowledge-based economy, evaluating and promoting human, structural and relational capital should be prioritized and this requires formulating or redefining health research institutes goals and missions based on indicators and components of intellectual capital.

KEYWORDS:
Intellectual capital, Human capital, Structural capital, Relational Capital, Health care.

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## INTRODUCTION

In today's economy, wealth growth and production come mainly from intangible assets. The economic development of most successful organizations suggests that value-added depends more on intangible assets than on physical assets [1, 2]. Intellectual capital is intangible resources and activities that allow the organization to turn financial, material, and human resources into a mechanism that creates value and innovation. In the current era, those countries are prosperous in a highly competitive economy compared to other countries with more robust intellectual capital [3, 4]. The term intellectual capital was first introduced by the well-known economist Jan kens Galberis in 1969 to explain the gap between the book value and the market value of institutes [5]. There are several definitions of the concept of intellectual capital in the literature. Bontis (2009) argues that intellectual capital is an attempt to make effective use of knowledge (the final product) versus information (raw material) [6].

According to another definition, intellectual capital includes knowledge, information, intellectual property, and experience that can be used to create wealth. It is also a collective mental ability with essential knowledge as a set [7, 8]. Intellectual capital is a combination of intangible resources and activities that enable the organization to add value to its stakeholders in a system of materials, financial resources, and human resources [9]. Intellectual capital also refers to all the knowledge and ability of employees and any process that is rooted in human power, knowledge, information, experience, innovation, learning ability of the organization and can be classified as intellectual capital, provided that it can value or store knowledge in the future (convert tacit knowledge into explicit knowledge). In another definition, intellectual capital indicates the inventory of knowledge of individuals in an organization [10, 11]. From Edvinson's point of view, intellectual capital includes practical experiences, organizational technology, customer relations, and professional skills needed to achieve a firm's competitive advantage [12]. Intellectual capital is composed of different components, but most theorists consider the main components of intellectual capital as human capital, structural capital and relational capital [13, 14, 15]. Human capital includes the skills, experience, efficiency, competencies of the workforce and their knowledge in the areas that are important, and necessary for the success of an organization and their talents, ethics and behavior.

Hence, it can be stated that on a national scale, human capital is the intellectual property of the inhabitants of a country that is improved by continuing education and training [16]. According to Brooking, this capital includes skills, expertise, problem-solving ability, and leadership styles. Human capital can be the soul and mind of intellectual capital sources. This capital leaves the company when the employees leave the organization, but the structural capital and the relational capital remain unchanged even when leaving the organization [17]. Relational capital includes all the relationships that exist between an organization and any other person or organization. These relationships are between the organization and employees as well as with customers, intermediaries, stakeholders, suppliers of raw materials, government officials and investors [18]. The central theme of this capital is the knowledge available in marketing and customer relationship paths. Relational capital plays a mediating role in intellectual capital and leads to the conversion of intellectual capital into market value and a determining factor in the organization’s business [19, 20]. Structural capital is the tacit knowledge related to an organization's internal processes in the field of distribution, communication and management of scientific and technical knowledge. Roos et al. believe that structural capital includes inhuman sources of knowledge, including databases, organizational charts, process implementation instructions, strategies, and executive plans. Structural capital covers a wide range of essential elements [21]. In addition, structural capital is owned by the organization and it exists in the organization and does not disappear even when the employees leave the organization [22].

Research centers and institutes are an essential part of the national innovation system [23]. The main challenge for the managers of this type of centers is to prepare an appropriate environment for the growth and development of mind and performance of employees and faculty members and to improve current processes, guidelines and increase learning capacity, increase communication with specialized journals, and national and international congresses and other scientific communities to obtain valuable, high-quality and reliable outputs from these knowledge-based centers. Given the influential and effective role of intellectual capital and its strategic nature on promoting organizational performance in research centers and institutes, especially in the vital sector of health, the way of management of intellectual capital and examining their performance can play a significant role in advancing the goals of this type of knowledge-based organizations. In addition, key elements of intellectual capital in health care research institutes and centers have been poorly understood, inadequately defined, and inefficiently reported. Thus, the questions of the present study are as follows: Is there a model that identifies the intellectual assets of health research institutes and introduces its main elements? What is the relationship of these elements with each other, and what effect do they have on each other?

## REVIEW OF LITERATURE

Manes-Rossi et al. (2020) conducted a study entitled "Intellectual capital in Italian healthcare: senior managers' perspectives". The results revealed that managers in this sector should invest more in increasing trust and respect and involve employees in organizational processes to play an active role. Furthermore, continuous management and communication between the main components of intellectual capital are crucial in improving the status of these organizations [24]. Ramirez et al. (2019) conducted research

entitled "Examining the intellectual capital web reporting by Spanish universities". The results revealed that human capital was the most obvious category and communication capital was the indicator with the lowest reporting rate. However, the quality of reporting structural capital was higher than relational and human capital. The results also showed that the size and internationality of the university affect the reporting of intellectual capital in Spanish public universities [25]. Jafari et al. (2018) conducted research entitled "Intellectual Capital at Two Levels of Organizational Excellence in Teaching Hospitals of Tehran University of Medical Sciences". Based on the results, deployment of organizational excellence leads to identifying the organization's strategy, identifying processes, paying attention to employee and client satisfaction, and improving employee knowledge, all of which help promote intellectual capital [26].

Aidi and Sademiri (2018) carried out research entitled "Assessment of Intellectual Capital Condition in Ilam University of Medical Sciences". Results revealed that the Ilam University of Medical Sciences status in terms of intellectual capital and its components, namely human capital, structural capital, and communication capital, was optimal. Based on the results, if the management of intellectual capital is considered in an organization, organizational innovation will develop in that organization [27]. Pirozzi and Ferulano (2016) conducted research to define a new conceptual framework or model for measuring and managing organizational performance, by measuring the financial and non-financial dimensions, and the intellectual capital of a health care organization. The proposed model was developed by combining the Common Assessment Framework (CAF) model with two other models representing intellectual capital and leadership. In the next step, this model was validated with a healthcare organization. The main advantage of this model is its ability to measure and manage intellectual capital, and the financial / non-financial performance of health care organizations. Using a measurement model facilitates the interpretation and evaluation of measured data [28].

Vagnoni and Oppi (2015) conducted applied research in a university hospital in Italy that faced strategic challenges. In the mentioned research, the role of intellectual capital for the strategic management of a university hospital was evaluated. The implementation of this research helped improve the strategic management process of health care organizations, especially university hospitals, considering the components of intellectual capital [29]. Evans et al. (2015) conducted a review study on the conceptualization, management, and measurement of intellectual capital. In the mentioned research, articles related to intellectual capital in the health sector, published in prestigious journals between 1990 and 2014, were systematically reviewed. The results showed that despite the growing number of articles related to intellectual capital in healthcare sector, there is still a gap in this area. Then, the conceptual and theoretical limitations of the literature in this area were explained. Finally, recommendations were proposed for future research [30]. Veltri et al. (2011) examined the concepts of intellectual capital in an important non-profit research institute in the healthcare sector that has been publishing intellectual capital reports for some time. The institute was the Swedish Center of Molecular Medicine (CMM), and this study aimed to evaluate the intellectual capital reporting model used by this center. This study also tried to identify the characteristics of intellectual capital reporting for health care institutes and provided lessons for intellectual capital reporting in such institutes [31]. Peng et al. (2007) sought to identify the components and relative importance of intellectual capital and performance measurement in Taiwan's healthcare industry. A questionnaire including a list of components of intellectual capital and performance indicators was prepared and distributed among 30 managers in the field of health after reviewing the literature and consulting with experts. Based on the collected data, the key elements of intellectual capital that are important for the management of Taiwan's healthcare industry were identified [32].

### Conceptual Model of Research

Conceptual model of research was extracted based on studies in the area of intellectual capital and proposed models of the intellectual capital of Bontis (2001), Secundo et al. (2010), Leitner model in research centers (2002), Bueno model et al. in research centers (2002) ), and Khorakian et al. (2017) [33, 34, 35, 36, 37]. Based on library studies, review of texts and approval of subject matter experts, dimensions and indicators of intellectual capital were determined. They included human capital dimension (including indicators of knowledge, skills and competence, innovation and attitude and motivation), structural capital dimension (including indicators of organizational processes, organizational culture, intellectual property, and knowledge-based infrastructure), and relational capital dimension (including indicators of interaction with the scientific community, interaction with employers and interaction with the community). The conceptual model of intellectual capital in this research is illustrated in (Figure 1).

## METHODOLOGY

The present research is applied in terms of aim, descriptive-correlational in terms of nature and survey in terms of method. The statistical population of the study consisted of faculty members and research experts of 8 research institutes in the area of health and treatment of Academic Center for Education, Culture and Research of Tehran. The minimum required sample was calculated based on Cochran's formula in this way:

$$n=\frac{\frac{Z^2 pq}{d^2}}{1+\frac{1}{N}\left(\frac{Z^2 pq}{d^2}-1\right)}$$

In this formula, N is the population size. Statistics p is the percentage of attribute distribution in the population ( ratio of people who have the study attribute). Statistics q is also the percentage of people who do not have the study attribute. If

the values of p and q are not known, their maximum value of 0.5 is used. At the 5% error level, the value of z equals 1.96, and Z2 equals 3.8416. The value of d is also allowed error. According to these values, the minimum sample was calculated to be 197 people. Since this questionnaire has 47 items and considering five samples for each item, the minimum proper sample size for performing statistical methods related to structural equation modeling is 235 samples. According to the sample size in each class and Cochran sampling formula and determining the minimum necessary and proper sample, the sample size was determined to be 305 people, who were selected by the two-stage stratified sampling method. Some questionnaires were deleted due to deficiencies in answering the questions and some of them were not returned to the research team despite repeated follow-ups. Finally, 281 complete samples were collected. The questionnair contained 63 questions that were designed in the form of a 5-point Likert scale from “strongly disagree” to “strongly agree”. To evaluate the content validity of the questions, t content validity coefficient (CVR) was used by considering the opinions of 20 experts.

$$CVR = \frac{n_E - \frac{N}{2}}{\frac{N}{2}}$$

In this formula, nE is the number of experts who evaluated the question useful and N is the total number of experts. The Lawshe table is used to judge the calculated CVR indicators for the questions. Since the number of experts in the final stage was 20, the questions with a content validity coefficient greater than 0.42 were accepted. In the second step, to calculate the content validity quantitatively, the content validity index (CVI) was used. Content validity index of experts' opinions is questioned in three areas of relevancy, clarity and simplicity and in four scales. With increasing the final content validity, the content validity index value becomes closer to 0.99.

$$CVI = \frac{number\ of\ votes\ are\ completely\ relevant\ + number\ of\ votes\ are\ relevant\ but\ requires\ to\ be\ reviewed}{\text{total number of rators}}$$

In the present study, questionnaires were distributed in two stages to confirm CVI, and in each step, the researcher was required to modify the questionnaire to standardize and validate it. Finally, questions with a content validity index greater than 0.79 were accepted. The mean content validity index for all questions of the questionnaire was 0.83. A total number of 16 questions were excluded. Cronbach's alpha coefficient of human capital (0.91), structural capital (0.80), and relational capital (0.82) was estimated to be higher than 0.7, indicating the internal consistency of items and confirmation of reliability. SPSS23 and PLS3 software was used to analyze the data.

# RESULTS

(Figure 2) shows the standard coefficients of the second-order factor model.

(Figure 3) shows the statistics of second-order factor model test.

(Figure 4) shows the cross validated communality using blindfolding.

## Structural model fit

Results of (Table 1) show that all test statistics are more than 1.96, so they can be confirmed at a 95% confidence level, indicating the significance and appropriateness of the structural model.

(Table 2) shows the rate of explanation of research structures, which indicates that they have high predictive power in research variables, given that all values are higher than 0.6.

According to (Table 3), since the values of Q2 for research structures have been greater than 0.3, it shows a strong predictive power for this structure and confirms the proper fit of the structural model of the research.

## General model fit

To examine the general model fit, the GOF index was calculated. The GOF value greater than 0.36 indicates a high fit.

How to calculate this index is as follows:

$$GOF = \sqrt{\overline{COMMUNALITIES} \times \overline{R^2}}$$

$$\overline{COMMUNALITIES} = 0.392 \qquad \overline{R^2} = 0.731 \qquad GOF = \sqrt{0.392 \times 0.731} = 0.535$$

The GOF index value for the general model fit is equal to 0.535, which confirms the very good fit of general model.

## Testing the hypotheses

(Table 4) shows the coefficients and factor loads of the factor model. According to the results, all significance levels are less than 0.05, so all variables of knowledge, skills and competence, attitude, motivation and innovation measure the human variable. The attitude and motivation variable with a coefficient of 0.897 has the highest weight and skill and the competence variable with a coefficient of 0.720 has the lowest weight. According to (Table 4), all variables of knowledge-based infrastructure, organizational culture, organizational processes, and intellectual property measure the structural variable.

The organizational culture variable with a coefficient of 0.880 has the highest weight and intellectual property variable with a coefficient of 0.738 has the lowest weight. All variables of

intellectual property, interaction with the scientific community, interaction with the employer and interaction with the community measure the relational variable. The variable of interaction with the scientific community with a coefficient of 0.899 has the highest weight, and the variable of interaction with the employer with a coefficient of 0.822 has the lowest weight.

### Investigating the relationships between variables

According to (Figure 5) and (Table 5), the set of fit indicators shows that the model has a good fit to the data.

Results of (Table 6) show that all relationships between variables are significant at the 95% level. The significance level of the relationship between the variables of "human" and "structural" is less than 0.05, so there is a relationship between these two variables and the value of this coefficient is equal to 0.995. The significance level of the relationship between the variables of "relational" and "structural" is less than 0.05, indicating the relationship between these two variables and the value of this coefficient is equal to 0.887. The significance level of the relationship between the variables of "relational" and "human" is less than 0.05, indicating the relationship between these two variables and the value of this coefficient is equal to 0.920.

## DISCUSSION

The present study showed that there is a relationship between all dimensions and variables of intellectual capital, presented in the form of a model in this study. Also, all the studied paths are significant. In this study, all test statistics were more than 1.96, so they can be confirmed at 95% confidence level, indicating the significance and appropriateness of the structural model. In the present study, the coefficients related to intellectual capital to human capital (0.941), intellectual capital to structural capital (0.882) and intellectual capital to relational capital (0.943) show the significance of the path and the appropriateness of the structural model. In addition, the significance level of the relationship between the variables of "human" and "structural" is less than 0.05, so there is a relationship between these two variables and the value of this coefficient is equal to 0.995. The significance level of the relationship between the variables "relational" and "structural" is less than 0.05, which indicates the relationship between these two variables and the value of this coefficient is equal to 0.887.

The significance level of the relationship between the variables of "relational" and "human" is less than 0.05, which indicates the relationship between these two variables and the value of this coefficient is equal to 0.92. The results of this study are consistent with the results of the studies conducted by Edvinson (1997), Bontis (1996), and Pirozzi and Ferulano (2016) on the existence of a strong relationship between the components of intellectual capital [13, 38, 28]. In the study conducted by Khaliq et al. (2018), a direct relationship was found between intellectual capital and human capital (0.913), structural capital (0.903) and relational capital (0.980), which is consistent with the present study [38]. Also, in the study conducted by Peng et al. (2007) in the health sector of Taiwan, human capital with a coefficient of 0.23, structural capital with a coefficient of 0.46 and relational capital with a coefficient of 0.25 affected on the organizational performance of hospitals, which is in line with this study in terms of priority of relational capital [32, 39].

In designing a model for measuring intellectual capital, Matines et al. (2006) showed that human capital and structural and relational capital positively affected on each other, which is in line with the present study [40]. In the study conducted by Nejat et al. (2017), human, structural and relational capitals had a positive effect on intellectual capital and the most significant impact was related to relational capital (0.399), followed by structural capital (0.359) and human capital (0.358), which is in line with the present study [41].

## CONCLUSION

To improve human capital in health care research institutes, it is recommended that the employees and faculty scoring system be implemented. Also, support should be provided for employees to take part in scientific and general workshops and courses. It is also recommended to encourage research on interdisciplinary topics, allocate some part of the profits and benefits of projects to the research team to increase the motivation, provided the job descriptions of each position in order to increase performance, facilitate the training process for new personnel, provide appropriate conditions for strengthening innovative behavior and implementation of concepts related to holding events to introduce innovative and research needs.

To improve the structural capital of health research institutes, it is recommended to make appropriate investments in creating knowledge-based structures, such as providing subscriptions for reputable scientific databases, and provide hardware and software equipment infrastructure for all research employees, to hold conferences, seminars and specialized meetings related to the specialized field of the research institute, and to eliminate additional bureaucratic processes. It is also recommended that organizational culture is promoted by encouraging employees to share knowledge and new findings. It is very important to create an atmosphere that employees and faculty members can freely share their opinions, suggestions and criticisms and to use their suggestions to update the mission and goals of the organization. It is also recommended to provide support (financial and non-financial) for publishing articles, books and scientific documents, and set procedures and structures related to registration of the patents and intellectual properties.

To improve the relational capital in health research institutes, it is recommended to hold conferences, seminars and meetings related to the specialized field of the research institute and to

support researchers and faculty members in well-known domestic and international conferences and seminars. Faculty members should be actively involved in scientific and research associations and the use of the website of the research institute to promote scientific findings should be planned. In order to seek and identify future research projects, focus groups and expert panels should be organized. Promotional actions with the aim of disseminating research findings with appropriate literature to the community should be done. The capacity of public media should be used to share research findings and strengthen the organization's public relations with general and specific audiences.

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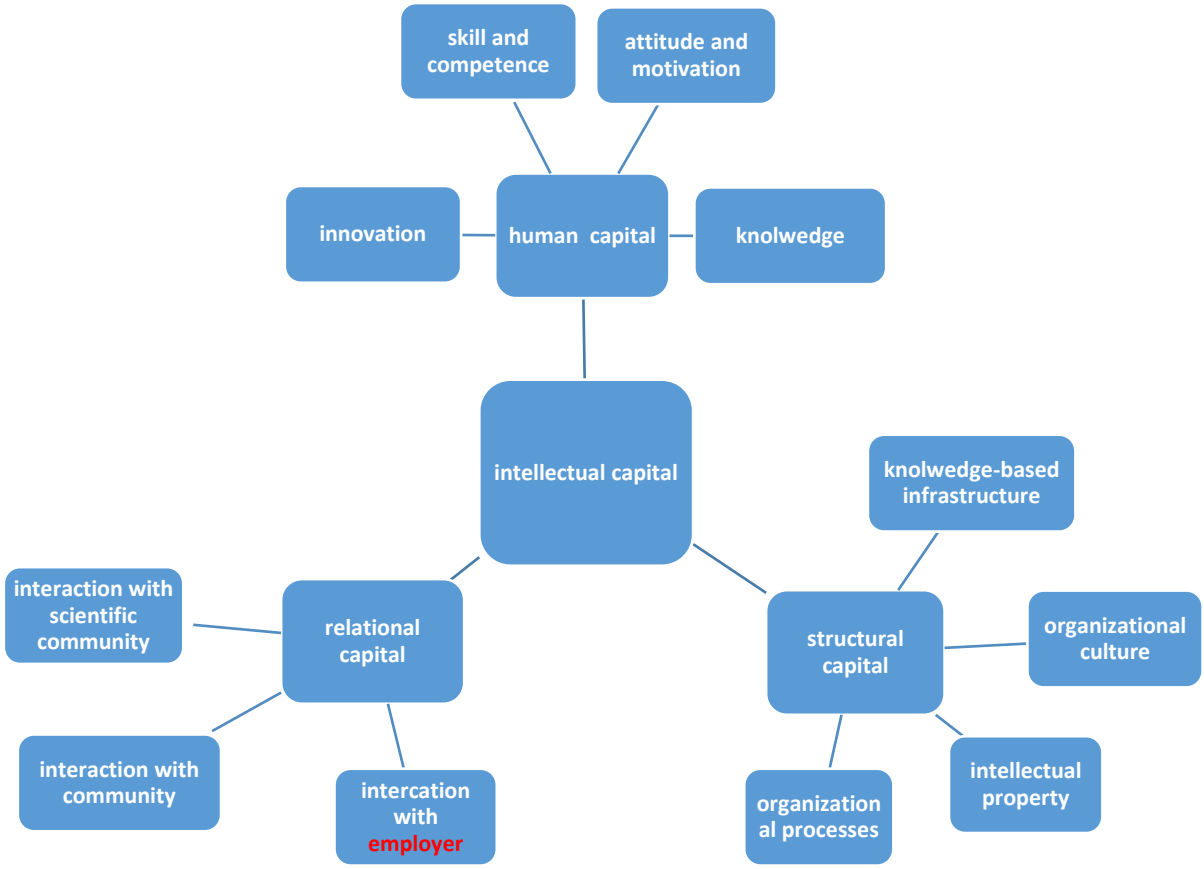


**Fig.1:** Basic conceptual model of intellectual capital in health care research institutes

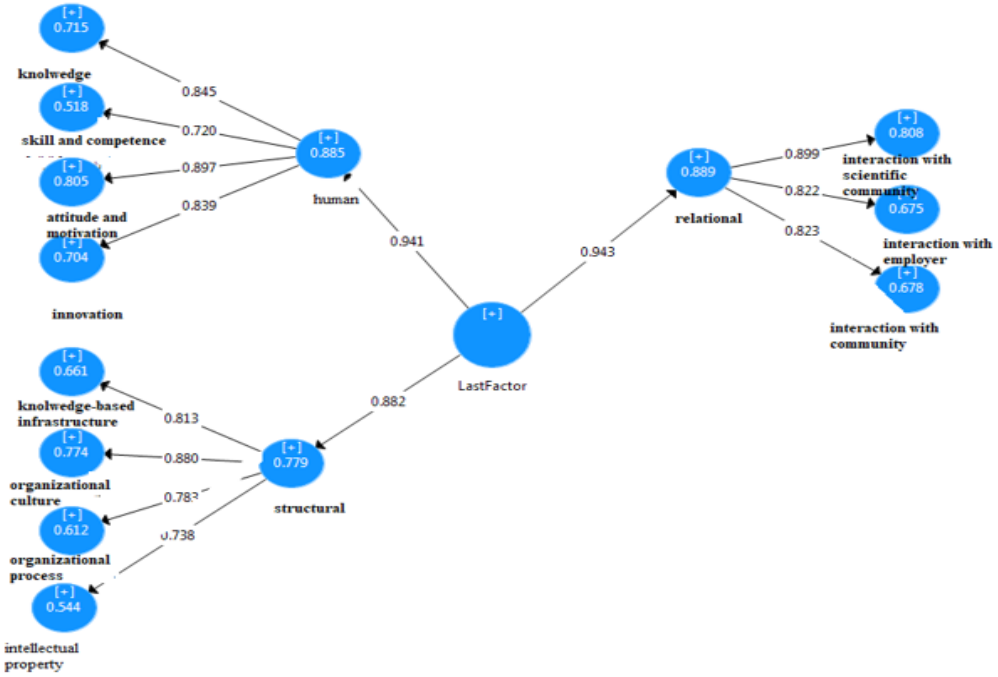


**Fig.2:** Standard coefficients of the second-order factor model

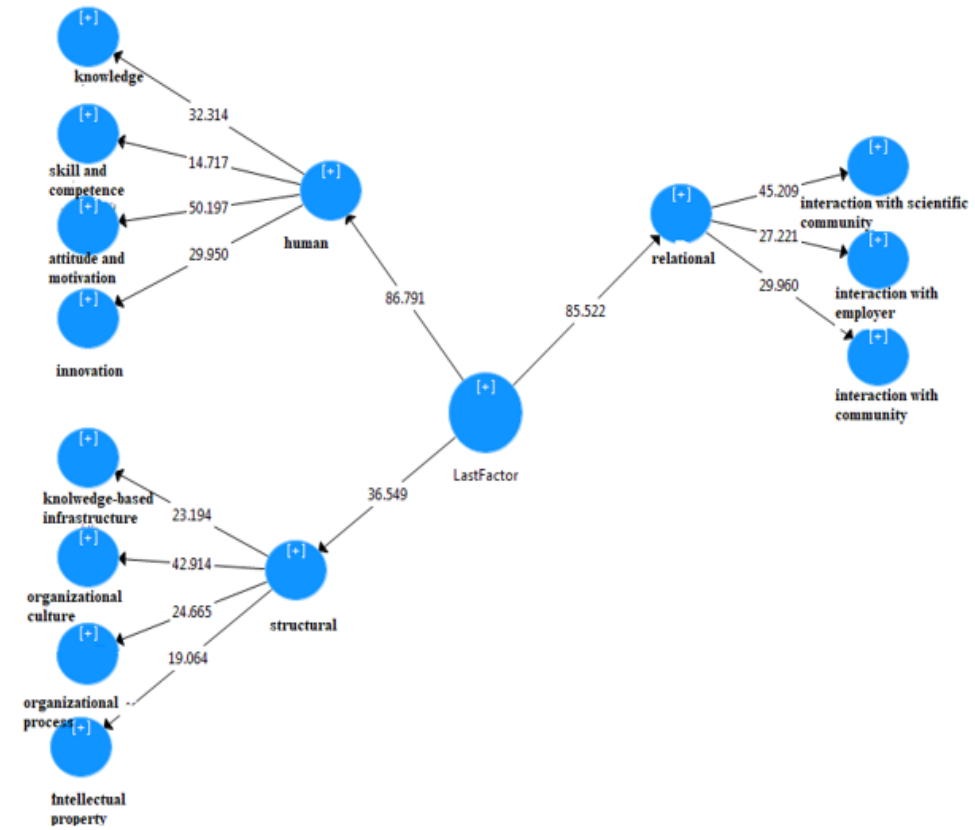


**Fig.3:** Statistics of second-order factor model test

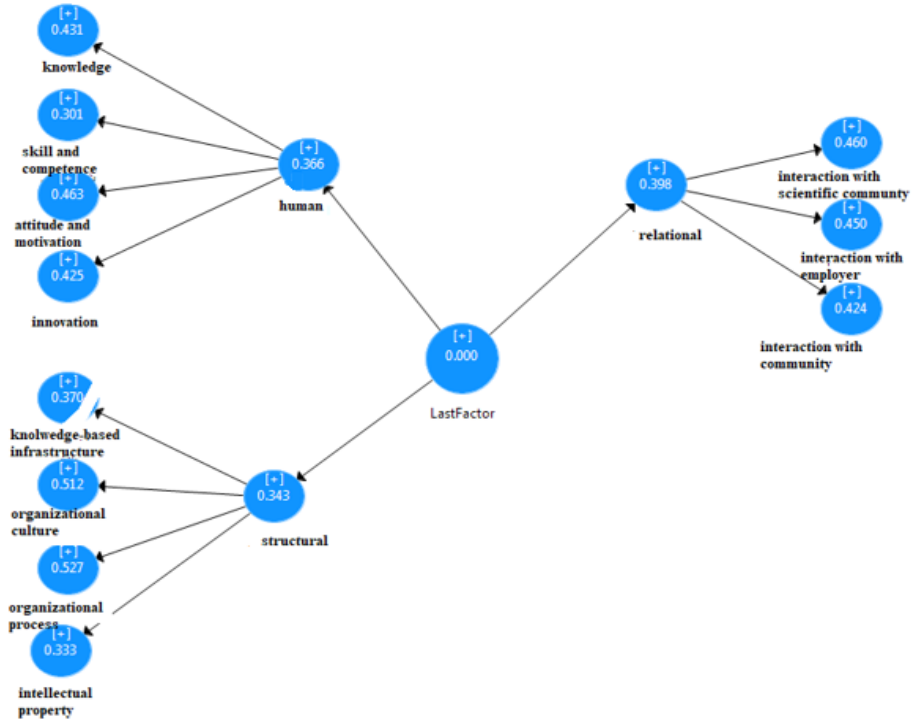


**Fig.4:** Cross validated communality using blindfolding

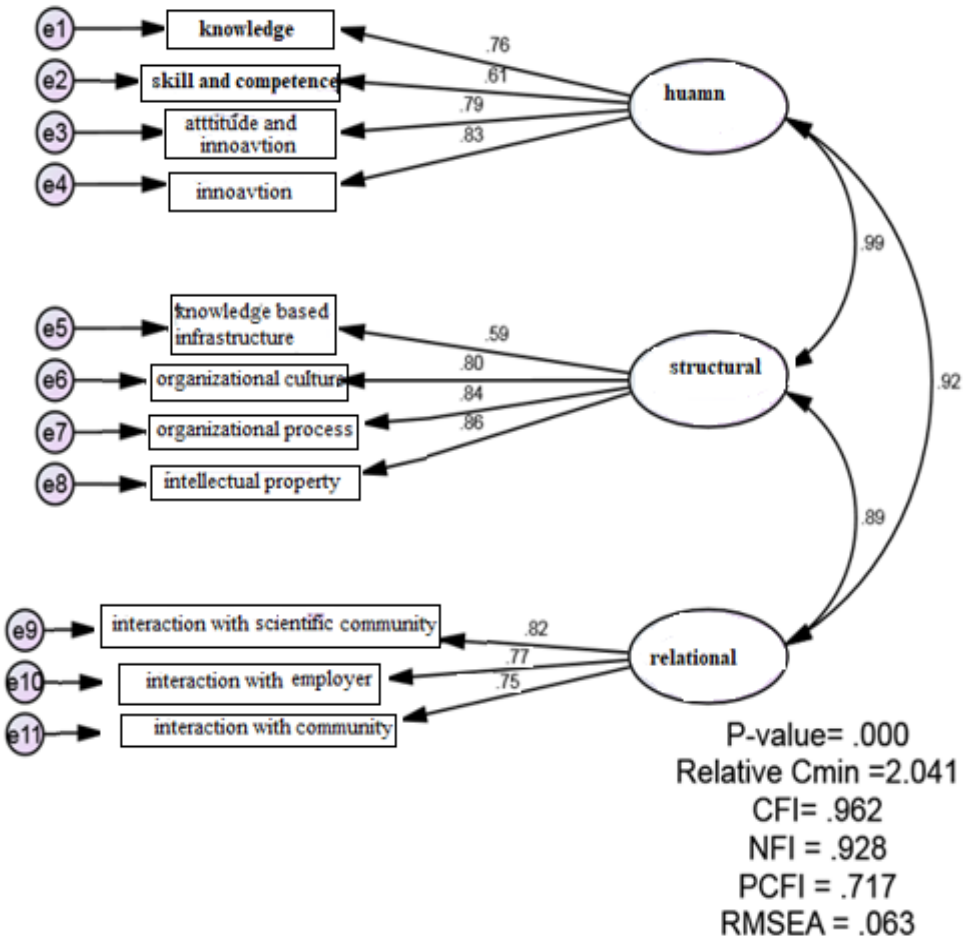


**Fig.5:** Relationships between variables

**Table 1:** Significance level of relationships between latent variables in research

| Row | Original Sample (O) | Sample Mean (M) | Standard Deviation (STDEV) | T Statistics (\|O/STDEV\|) | P Values |
|---|---|---|---|---|---|
| human LastFactor -> | 0.941 | 0.940 | 0.010 | 86.791 | 0.000 |
| relational LastFactor -> | 0.943 | 0.941 | 0.010 | 85.522 | 0.000 |
| structural LastFactor -> | 0.882 | 0.884 | 0.024 | 36.549 | 0.000 |
| human -> knowledge | 0.845 | 0.847 | 0.024 | 32.314 | 0.000 |
| human -> skill and competence | 0.720 | 0.717 | 0.047 | 14.717 | 0.000 |
| human -> attitude and motivation | 0.897 | 0.896 | 0.017 | 50.197 | 0.000 |
| human -> innovation | 0.839 | 0.838 | 0.027 | 29.950 | 0.000 |
| relational -> interaction with employer | 0.822 | 0.819 | 0.032 | 27.221 | 0.000 |
| relational -> interaction with community | 0.823 | 0.822 | 0.032 | 29.960 | 0.000 |
| relational-> interaction with scientific community | 0.899 | 0.896 | 0.020 | 45.209 | 0.000 |
| structural -> intellectual property | 0.738 | 0.742 | 0.039 | 19.064 | 0.000 |
| structural -> knowledge-based infrastructure | 0.813 | 0.814 | 0.032 | 23.194 | 0.000 |
| structural -> organizational culture | 0.880 | 0.879 | 0.019 | 42.914 | 0.000 |
| structural -> organizational process | 0.783 | 0.782 | 0.030 | 24.665 | 0.000 |

**Table 2:** Explanation coefficient index of research structures

| Row | R-square | R Square Adjusted |
|---|---|---|
| Knowledge variable | 0.715 | 0.713 |
| Skills and competence variable | 0.518 | 0.515 |
| Attitude and motivation variable | 0.805 | 0.804 |
| Innovation variable | 0.704 | 0.702 |
| Knowledge-based infrastructure variable | 0.661 | 0.659 |
| Organizational culture variable | 0.774 | 0.773 |
| Organizational process variable | 0.612 | 0.610 |
| Intellectual property variable | 0.544 | 0.541 |
| Interaction with the scientific community variable | 0.808 | 0.807 |
| Employer interaction variable | 0.675 | 0.673 |
| Interaction with community variables | 0.678 | 0.676 |
| Human variable | 0.885 | 0.884 |
| Relational variable | 0.889 | 0.888 |
| Structural variable | 0.779 | 0.777 |

**Table 3:** $Q^2$ values of endogenous research structures

| Row | $Q^2$ |
|---|---|
| Knowledge variable | 0.431 |
| Skills and competence variable | 0.301 |
| Attitude and motivation variable | 0.463 |
| Innovation variable | 0.425 |
| Knowledge-based infrastructure variable | 0.374 |
| Organizational culture variable | 0.508 |
| Organizational process variable | 0.522 |
| Intellectual property variable | 0.461 |
| Interaction with the scientific community variable | 0.459 |
| Employer interaction variable | 0.446 |
| Interaction with community variables | 0.419 |
| Human variable | 0.366 |
| Relational variable | 0.398 |
| Structural variable | 0.343 |

**Table 4: Coefficients and factor loads of the model**

| Row | | Coefficients | SD | T test statistic | P-VALUE |
|---|---|---|---|---|---|
| Knowledge variable | Human | 0.845 | 0.024 | 32.314 | 0.000 |
| Skills and competence variable | | 0.720 | 0.047 | 14.717 | 0.000 |
| Attitude and motivation variable | | 0.897 | 0.017 | 50.197 | 0.000 |
| Innovation variable | | 0.839 | 0.027 | 29.950 | 0.000 |
| Knowledge-based infrastructure variable | Structural | 0.813 | 0.032 | 23.194 | 0.000 |
| Organizational culture variable | | 0.880 | 0.019 | 42.914 | 0.000 |
| Organizational process variable | | 0.783 | 0.030 | 24.665 | 0.000 |
| Intellectual property variable | | 0.738 | 0.039 | 19.064 | |
| Interaction with the scientific community variable | Relational | 0.899 | 0.020 | 45.209 | 0.000 |
| Employer interaction variable | | 0.822 | 0.032 | 27.221 | 0.000 |
| Interaction with community variables | | 0.823 | 0.032 | 29.960 | 0.000 |
| Human variable | Final factor | 0.941 | 0.010 | 86.791 | 0.000 |
| Relational variable | | 0.943 | 0.010 | 85.522 | 0.000 |
| Structural variable | | 0.882 | 0.024 | 36.549 | 0.000 |

**Table 5: Fit indices**

| Fit indices | value | Criterion value | Result |
|---|---|---|---|
| Significance level | 0.000 | More than 0.05 | Inappropriate |
| X2 | 2.041 | 2-5 | Inappropriate |
| CFI | 0.962 | More than 0.9 | Inappropriate |
| NFI | 0.928 | More than 0.9 | Inappropriate |
| PCFI | 0.717 | More than 0.5 | Inappropriate |
| RMSEA | 0.063 | Less than 0.8 | Inappropriate |

**Table 6:** Relationships between variables

| | | | Non-standard coefficient | standard coefficient | Standard error | Test statistic | Significance level |
|---|---|---|---|---|---|---|---|
| Human | <--> | Structural | **438.0** | **995.0** | **060.0** | **310.7** | **0.000** |
| Relational | <--> | Structural | **355.0** | **887.0** | **055.0** | **505.6** | **0.000** |
| Relational | <--> | Human | **283.0** | **920.0** | **043.0** | **606.6** | **0.000** |