A Study on the Feasibility of the Establishment of Knowledge Management at Payam nour University of Golestan Province

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ABSTRACT

In order to investigate and consider the feasibility of the establishment of knowledge management at Payam nour universities of Golestan province elicited from reviewing the research literature, the researchers endeavored to identify the factors affecting the establishment of knowledge management and the knowledge management components, and then to consider the way of their influence as well as their priorities. Finally, through the presented model, the best option among possible solutions is selected. The investigators have gone through the stages following positing hypotheses 1 to 5. In the end, the results of conducted research are discussed.

The method of the research is descriptive-survey. Data and information is collected through the questionnaire. The statistical community of the study is faculty members and the employees (official, contractual, conditional) of all different branches of payam Nour universities in Golestan province in 89- 90 academic year. The statistical community comprises 172 people from those 76 people are chosen based on stratified sampling method. The obtained data is analyzed through inferential and mathematical statistic. Finally, a model applicable to the establishment of knowledge management at Payam Nour universities of Golestan province is presented.

Keywords

Knowledge, Knowledge management, Effective factors in knowledge management, Feasibility, Knowledge management models

1. INTRODUCTION

Managers' awareness of the value of the intellectual capitals will get their minds round the ways for releasing these powerful abilities and capacities. As Nonaka and others have acknowledged, organizational knowledge is the main source of acquiring permanent competitive advantage [1]. Peter Drucker was the first scholar who attracted public's attention to this subject and, since then, many other thinkers of management affairs as well as ascetic and transcendental companies have taken huge strides in this regard (ibid).

The production, as a demanding work with high investment in a relatively cheap and homogeneous work along with

hierarchical management, is substituted for knowledge organizations. In organizations the huge burden of duties solely rests on the shoulder of a few people. Since knowledge management requires more cooperation, organizational hierarchy has been put aside. The development and status promotion of a company merely relies on holistic company competence, the range of applicability and new knowledge acquisition [2]. An organization, in the science era, is "an organization which learns remembers and works at the apogee of information, knowledge, and available technical knowledge" [3].

With regard to the rapid changes in the economic environment, the role of the universities or higher education institutions as producers of knowledge have been considerably challenged by multiple shareholders. In order to respond to this challenge, it is proposed that universities use the principles and the concepts of knowledge management with the purpose of implementing the infrastructural work in terms of applied research and with appropriate program-based training, using knowledge to support decision making management in order to improve internal document management, exploiting the elevated level of knowledge distribution and using knowledge to materialize a qualitative change in the educational process. [4].

From Jillinda's point of view, colleges and universities are considered important opportunities for employing knowledge management methods, ranging from training to research services, so as to support part of their missions [5].

1.1 Expression of the Problem and the Necessity of Doing Research

Successful organizations are those which turn their personnel's knowledge into organizational ability. Many companies and organizations desist from activity despite their high investment for the exploitation of the innovative methods for utilizing knowledge in their organization and exorbitant software and hardware investments to establish the knowledge management since they failed to attain the expected result [6].

Ghazali and his colleagues believe that the major traditional role of universities is production and propagation of knowledge through thorough research and educational activities as well as their transcendental programs to fulfill general expectations of the society. Also, they should not overlook the importance of conformity with appropriate methods originated from communication and informational technology due to their widespread use. From the viewpoint of researchers, introducing the tools and methods of knowledge management enables universities to share their knowledge to raise the level of their training and research cooperation and also to facilitate student-employee cooperation along with other share holders [4]. The University environment is inherently appropriate for employing the methods and principles of knowledge management. To authenticate the above-mentioned claim, the following rationales should be taken into consideration [4]:

- Universities usually have modern informational infrastructure.
- Sharing Knowledge with others is naturally performed by speakers.
- It is more desirable for students to acquire knowledge straightaway from flexible sources.

From Rowley's point of view, in order to administer knowledge management activities successfully, the university managers should vigilantly and clearly direct processes related to the production of organization's knowledge investments, and recognize the value of organization's intellectual capitals so that they can perform their permanent role In the society. On the other hand the mere focus on the technical aspects, such as increasing the level of computer knowledge and providing enough information and communicational infrastructure does not necessarily lead to knowledge management activities. Thus, it is propounded as a management requirement to overcome the grave challenges associated with social and cultural issues in an organizational knowledge management [4].

Today, numerous managers have acknowledged the essential role of knowledge in acquiring competitive advantage. It has provoked the others to keep up with the strategic goals in an organization. Therefore, knowledge management is posited as a competitive requirement in the organizations. However, lack of the appropriate infrastructure and basic requirements employ such a process has led to manpower antipathy and waste of financial resources. Thus, prior to taking any measure, the organizations' tendency towards establishing the requirements should be ensured. Holt has considered readiness of an organization or a person in the face of the organizational change as an essential requirement for success. Accordingly, readiness for the knowledge management can be simply defined as a set of essential requirements for successful implementation of knowledge management. In other words, readiness for knowledge management consists of a set of capabilities of a company or organization to access the required infrastructure for knowledge management and the capacity to use them [7]. Jillinda et al. on the applicability of the knowledge management is at the universities, have stated that sharing knowledge have set in extensive grounds for this subject. Davenport and Prusak have also opined that the implementation of knowledge management in the organization necessitates adopting a broad and integrative scope towards culture, organization, technology. However, Niyaz Azari and Amouyi have accentuated the cultural factor in the implementation of knowledge management in organizations [8. Davenport and Prusak believe that the plans which are not appropriately combined with

organizational culture cease to grow. Afrazeh points to the necessity of assessing the infrastructure condition and necessary requirements, before the establishment of knowledge management in the organization in order to reduce the risk [9].

With regard to the fact that Payam Nour University is one of the most important and extensive educational organizations in Iran intend to materialize its motto entitled "education for all people in any place and any time". The establishment of knowledge management in an organizational system is very important. Since no impeccable version exists to be fully compatible with the entire knowledge management spheres, it seems to be inevitable to taking into account the organization's readiness for evaluative studies within the framework of knowledge management. Due to the fact that improper infrastructure in satisfying the requirements will lead to loss with high expenses in the course of a follow-up process, readiness assessment through the establishment of knowledge management system reducing the risk in an organization is of paramount importance.

The aim of the research is to study and consider the feasibility of the establishment of knowledge management at Payam Nour universities in Golestan province. The influential factor in the implementation of knowledge management in Payam Nour Universities of Golestan province has been identified and the way of their effectiveness and priority is taken into consideration. Finally, the appropriate model for the establishment of knowledge management at Payam Nour Universities of Golestan province is presented.

1.2 Conceptual Model

The conceptual model of the research, based on the research hypotheses, is to identify and recognize the effect of influential infrastructure on the establishment of knowledge management at Payam Nour universities of Golestan province (Figure 1).

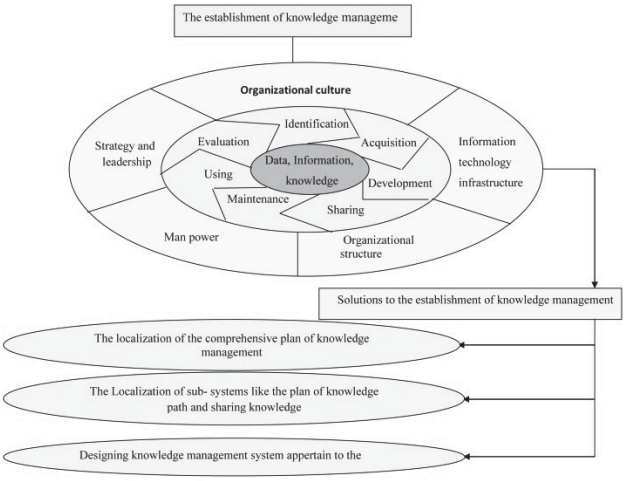

Figure 1. Conceptual model of research

2. REVIEW OF RESEARCH LITERATURE

Reviewing the knowledge management journals indicates that knowledge management and the respective concepts are recognized as the fundamental components of organizations, which brings about perpetuity and maintenance intertwined with competitive advantage. In other words, organizations equipped with knowledge resources are vested with power to introduce lasting value to the customers through combination of traditional sources with new and distinctive methods. In fact, it is attributed to the organizational knowledge that empowers the organization to develop its resources, to strengthen its pivotal roles and eventually to create a competitive advantage. Meanwhile, the organizations exploiting the created opportunity through management tools and modern technology will be successful. Knowledge management is a management tool, which creates value from organization's invisible assets (human capitals) [10].

Knowledge is a source of survival for the organizations and access to the related knowledge and profound understanding of the entire levels is also a prerequisite for success in the organizations. Sharma estimated that without applying knowledge management, more than 80% of the information that the employees acquire in practice is invisible in the organization. Thus, it seems that they remain covert and unusable sources in the management domain, and consequently we should call them wasted informational sources [11].

The knowledge can be regarded as a combination of experience, values, existing information and systematic professional attitudes, which presents a framework for the evaluation and utilization of the new information and experience. Knowledge is formed in the minds of people. It can also be tracked down abundantly in minds, documents, knowledge resources, work processes, organizational processes, practices and norms [2].

The major feature of knowledge management can make a contribution to keep a record of the managers and staff's knowledge of the organization whether individually or in a group in which the results of their decision making will be available and exploitable in similar cases [1].

Form the other perspective, knowledge management consolidates saving and propagation of knowledge through giving value to the intellectual capitals e.g., knowledge management promotes undivided cooperation of people, technology, the processes of the organization and the organizational structure in order to increase the value through reusing and innovation. The cooperation is acquired through creation of knowledge, sharing knowledge and its application as well as through feeding valuable learned lessons and orthodox methods in the memory of organization in order to pave the way for continuous organizational training [3].

The results of Monavverian research indicate that the organizational culture, information technology, manpower and education are effective in knowledge management. However, cultural factor is regarded as the most important factor in the implementation of the knowledge management in organizations [16]. To implement knowledge management in the organization, appropriate measures should be taken in several domains e.g., culture, organization and technology [12].

Research findings of Pauleen and Mason as well as Bhatt indicate that the most important obstacle in the implementation of knowledge management in organizations is management and cultural factors [8].

Jahanian determined to answer the question whether the creation of the business model and business processes representations, using objective-oriented methodology is influential in the improvement of knowledge management in the organization or not? It was eventually concluded that there was a significant relationship between different kinds of objective- oriented models and the process of knowledge management. Besides, the four components of the knowledge management comprising the creation of knowledge, the accumulation of knowledge, sharing of knowledge and using knowledge are the most effective variables [13].

Pursuing the above course of action, Movahhed Zadeh accentuated determining the ups and down of the organization following helpful guidance for understanding knowledge in the most effective way. In the initial stage, determining the gap in the organizational knowledge as an indicator of the distance between the status quo of knowledge and the organization's required and desirable knowledge is a must which explicate the vacuity of organization's knowledge. Accordingly, it seems to be exigent to opt for the appropriate methods to remove or reduce the gap. Being assured of establishment of balance between the explicit and implicit knowledge in an organization is one of the factors and indicators of success. The creation of commitment among the employees, and managerial levels towards the organizational understanding, personnel's endeavor and the managers who set the example in disseminating knowledge will lead to the reinforcement of their functions, facilitating team works as one of the main grounds of innovation [14].

Khajavi in her research entitled "The establishment of knowledge management system and presenting an applicable model in Tehran municipality," used a full-scale model compatible with Nonaka and Takeuchi model to study the six indicators of the leadership in the human resources, structure, knowledgement processes, information technology and culture for the establishment of the system of knowledge management in Tehran municipality. Accordingly, he pinpointed the proper priority of the mentioned indicators [15].

Mohayidin and partners included eight private and public universities to assess the level of performance in universities and to determine the factors, involved in the effectiveness of knowledge management performance at three levels of individual, college and University. They used factor analysis to determine the effective factors in knowledge management performances and also multiple regressions to analyze and to determine various variables with added values. Consequently, it can improve the performance of the universities of Malaysia. The findings show that info- structure support, infrastructure capacity (information technology), info-culture and acquisition of knowledge, production, saving and distribution are the important factors in the formation of first measures of knowledge management.

Mian and Petri in their research with the purpose of an empirical study on the way that cultural artifacts affect the implementation of knowledge management in project-based organizations concluded that there is a relationship between cultural tangible artifacts and the importance of knowledge management. When the members of the organization find the organizational culture as the tangible goals, they consider the role of information technology in management as a key element supposing there is no need to pay heed to the human factor. In other words, since human being is not part of the nature of knowledge, he cannot play a significant role in the implementation of knowledge management. In the organizations that the reflection of the organizational culture is felt in their daily routine work, the role of information technology is considered as an important issue in the implementation of knowledge management. These organizations believe that more attention should be paid to human beings due to their essential role in the implementation of knowledge management and their irrefutable role in the nature of knowledge management [16].

The results of Maria and Chen demonstrate that the successful implementation of knowledge management in small and medium companies depends on the consistent mixture of their both process and infrastructural abilities, including technology, culture, and organizational structure. In order to reap more benefit from knowledge management for business operations and decision making, the organizations should understand the advantage of the implementation of knowledge management, and the status of their organization in terms of preparedness to implement the knowledge management [17].

3. RESEARCH QUESTIONS

- How do the effective factors influence the establishment of knowledge management at Payam Nour Universities in Golestan province?
- What are the effective factors' priorities in knowledge management for the establishment of knowledge management at Payam Nour Universities in Golestan

province?

- how do the components of the process of knowledge management influence the Payam Nour University of Golestan province?
- what are the components of the process of knowledge management at Payam Nour Universities of Golestan province
- Is it possible to establish the best method of the establishment of knowledge management at Payam Nour Universities of Golestan province?

4. RESEARCH HYPOTHESIS

- The factors such as organizational culture, organizational structure, and infrastructure of information technology, strategy and leadership, and manpower in the establishment of the knowledge management system at Payam Nour Universities of Golestan province have different effect. Organizational culture is the most effective factor in the establishment of knowledge management at Payam Nour Universities of Golestan province.
- The components of knowledge management (including the identification of knowledge, knowledge acquisition, sharing knowledge, knowledge development, maintenance and saving knowledge, the application of knowledge and the evaluation of knowledge) affect differently on the process of knowledge management at Payam Nour Universities of Golestan province.
- The axis of sharing information is the most important component of knowledge management at Payam Nour Universities of Golestan province.
- The model presented by the combinational approach of analytic hierarchy process and analytical network process is a reliable model for the selection of the best method in the implementation of knowledge management at Payam Nour University.

5. RESEARCH METHOD

In terms of the goal this research is an applied research and regarding methodology is a descriptive- survey. This research is going to study and consider the feasibility of the establishment of knowledge management at Payam Nour Universities of Golestan province. Data is of the kind of the oral variables of Likret scale which is asked from the samples of statistical community through the questionnaire.

5.1. Statistical Community

The statistical community of this research is the faculty members and the staff (official, contractual, conditional) of Payam Nour Universities at all different branches of Golestan province in academic year 89- 90. The number of members of the statistical community has been 172.

Table 1. The number of the members of statistical community

The name of unit	The number of employees	The number of faculty members	Total number
Gorgan	44	2	46
Gonbad e Kavous	41	16	57
Bandar Torkman	16	6	22
Bandar Gaz	2	2	4
Kord Kouy	10	3	13
Ali Abad	2	1	3
Ramiyan	2	0	2
Galikesh	8	1	9
Azad Shahr	2	1	3
Kalaleh	7	2	9
Agh ghala	3	1	4
Total	137	35	172

5.1.1. Sample Size

The sample size estimation is calculated with the purpose of assessing the community mean by using the following formula [18].

(1) $$n = \frac{Z_{\frac{\alpha}{2}}^2 S_x^2}{\varepsilon^2} = \frac{1.96^2 * 17.33^2}{3.9^2} = 75.69 = 76$$

N: sample size

α: significant level of p that is considered as 0.05.

$Z_{\frac{\alpha}{2}}^2$: It is extracted from the standard normal probability table and its value is equal to 1/96.

ε: The amount of precise estimation or possible mistake

(2) $$\bar{x} = \frac{26 * 5 + 26}{2} = 78$$

(3) $$\varepsilon = \frac{78 * 5}{100} = 3.5$$

Sx: standard deviation of the sample

(4) $$S_x = \frac{1}{6}R$$

(5) $$S_x = \frac{26 * 5 - 26 * 1}{6} = 17.33$$

The number of questions: 26

Score recording: based on Likert scale (1-5)

From 76 distributed questionnaires 68 questionnaires returned.

5.1.2. Logic of Sampling

For more similarity among samples and community and to

increase the precision of sampling, the stratified sampling is used so that, first the community is divided into the homogeneous groups and the number of samples in each group is specified, and then using simple random sampling the required number is chosen from each group [18].

Table 2. Determining the number of samples required in each university branches of Payam Nour University of Golestan province.

The name of unit	The number of employees	The number of faculty members	
Gorgan	46	0.27	18
Gonbade Kavous	57	0.33	23
Bandar Torkman	22	0.13	9
Bandar Gaz	4	0.02	2
Kord Kouy	13	0.08	5
Ali Abad	3	0.02	1
Ramiyan	2	0.01	1
Galikesh	9	0.05	4
Azad Shahr	3	0.02	1
Kalaleh	9	0.05	4
Agh ghala	4	0.02	2
Total	172	1.00	68

6. DATA ANALYSIS METHOD

The first and the third hypothesis were analyzed through the inferential statistics, while the second and the fourth hypothesis were analyzed through the mathematical method. For the fifth hypothesis, group decision making method was used for ranking the solution options.

6.1. Research Findings Regarding the 1st Question & Hypothesis

According to the first hypothesis, the factors such as organizational culture, organizational structure, information technology infrastructure, the leadership and strategy, and manpower affect the establishment of knowledge management system differently.

The presented formulae can be interpreted as follows:

a. The effective factors influence differently.

b. The effective factors influence equally.

$$\begin{cases} H_0 : \mu_1 \neq \mu_2 \neq \mu_3 \neq \mu_4 \neq \mu_5 \\ H_1 : \mu_1 = \mu_2 = \mu_3 = \mu_4 = \mu_5 \end{cases}$$

The result shows that the ranking of the factors is not the same and there is a significant difference between them (Table .3). Accordingly, it can be concluded that the research assumption cannot be rejected. In other words, the effective factors affect the establishment of knowledge management differently at Payam Nour universities in Golestan province.

Table 3. Ranking of the effective factors through Friedman test.

The effective factors	Mean Rank
Organizational culture	2.93
Organizational structure	1.81
Information technology infrastructure	3.59
Strategy and leadership	2.24
Man power	4.43

Table 4. The Statisticsa of Friedman test for the 1st hypothesis.

N	67
Chi-Square	118.282
df	4
Asymp. Sig.	0.000

6.2. Research Findings Regarding the 2nd Question & Hypothesis

According to the second hypothesis, the most important factor influencing the establishment of knowledge management system is the organizational culture.

In order to prove the proposed hypothesis, special vector technique and the analytical network process are used. The hierarchy chart is as follows:

The special vector of the effective factors and sub-factors with the rate of incompatibility is 0.04 and 0.05 (Table 5 &6). In contrast with the second hypothesis, it shows that information technology is the most influential factor and communication technology is the most influential sub-factor.

Table 5. Special vector of factors affecting the establishment of knowledge management.

Man-power	Strategy and leadership	Organizational Structure	Organizational culture	IT infrastructure
0.042	0.077	0.161	0.303	0.417

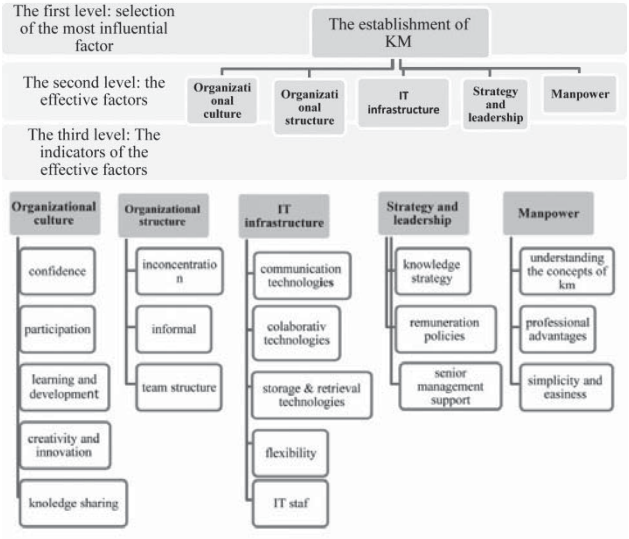

Figure 2. Hierarchical model of the factors affecting the establishment of knowledge management.

Table 6. Special vector of the sub-factors affecting the establishment of knowledge management.

factor	indicator	weight
Organizational culture	confidence	0.018
	participation	0.064
	Learning and development	0.053
	creativity and innovation	0.053
	knowledge sharing	0.131
Organizational structure	inconcentration	0.069
	informal	0.023
	team structure	0.008
IT infrastructure	communication technologies	0.18
	collaborative technologies	0.066
	storage & retrieval technologies	0.155
	flexibility	0.049
	IT staff	0.031
Strategy and leadership	knowledge strategy	0.033
	remuneration policies	0.007
	senior management support	0.033
Manpower	understanding the concepts of km	0.018
	professional advantages	0.003
	simplicity and easiness	0.005
total		1.00

6.3. Findings of the Research regarding the 3rd Question & Hypothesis

The components of knowledge management including the identification of knowledge, the acquisition of knowledge, sharing knowledge, knowledge development, maintenance and saving knowledge, application of knowledge along with the evaluation of knowledge affect the process of knowledge management differently. The presented formulae can be interpreted as follows:

a. The effective factors influence differently.

b. The effective factors influence equally.

$$\begin{cases} H_0 : \mu_1 \neq \mu_2 \neq \mu_3 \neq \mu_4 \neq \mu_5 \neq \mu_6 \neq \mu_7 \\ H_1 : \mu_1 = \mu_2 = \mu_3 = \mu_4 = \mu_5 = \mu_6 = \mu_7 \end{cases}$$

Table 7. The ranking of the components of knowledge management process drawn from Friedman test.

	Mean Rank
including the identification of knowledge	6.03
the acquisition of knowledge	3.38
knowledge development	4.93
sharing knowledge	4.55
maintenance and store knowledge	3.50
application of knowledge	3.12
the evaluation of knowledge	2.50

Table 8. The Statisticsa of Friedman test for the third hypothesis.

N	67
Chi-Square	118.282
df	4
Asymp. Sig.	0.000

The results show that the ranking of components is not the same and the effect of the components of knowledge management on its process is not identical (Table 7&8), indicating a significant difference between them. Accordingly, it can be concluded that the assumption of H of the study cannot be rejected.

6.4. Research Findings Regarding the 4th Question & Hypothesis

According to the fourth hypothesis, sharing knowledge is

the most important component of the process of knowledge management.

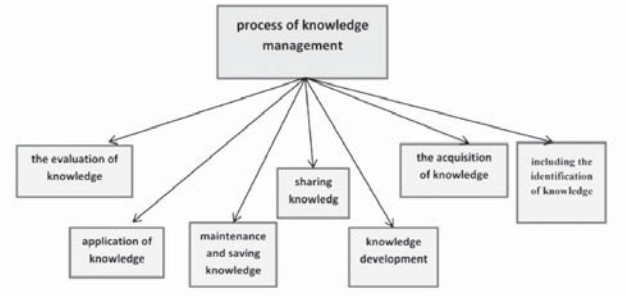

Figure 3. The hierarchical model of knowledge management components

The special vector of knowledge management processes in terms of priority indicates that the knowledge management components with the compatibility rate are 0.30 (Table . 9).

Table 9. the special vector of knowledge management processes

Knowledge development	including the identification of knowledge	the acquisition of knowledge	application of knowledge	the evaluation of knowledge	sharing knowledge	maintenance and store knowledge
0.051	0.103	0.103	0.103	0.103	0.268	0.268

According to the above special vector congruent to the fourth hypothesis, sharing knowledge component is equal to the saving and maintenance component (0.268), which is more than other components in of knowledge management the process.

6.5. Research Findings regarding the 5th Question & Hypothesis

According to the fifth hypothesis, the model presented by the combinational approach in the analytic hierarchy process along with the analytical network process is a reliable method in choosing the best method for the establishment of knowledge management at Payam Nour universities in Golestan province.

To achieve the objective, the solution options for the establishment of knowledge management are displayed (Table 10). The options are ranked in terms of two methods of group decision making:

a. The method of analytic hierarchy process

b. The method of analytical network process

Table 10. The solution options for the establishment of knowledge management.

The solutions	Ai
The implementation of the comprehensive plan of knowledge management and its localization in the organization	A1
The modules of knowledge management system like the sub systems of the plan of knowledge path and sharing knowledge	A2
Designing and building a knowledge management system appertain to the organization	A3

The purpose of the study is to detect the solution for the establishment of knowledge management in the organization. The cluster of components includes information technology, infrastructure, manpower, organizational culture, organizational structure, and the strategy and leadership. Concurrent with the following main criteria, some sub criteria are taken into consideration displayed in the hierarchical model (Figure 2).

The entire criteria of the second level have internal relationship with each other as well as the sub criteria of the third level. Organizational culture sub-systems can be affected by the other systems while sustaining relationship. It is assumed that the sub-criteria have no effect on themselves. In this case options have no effect on the criteria. The mentioned model is displayed under the network analysis in Figure 4.

The factors, sub-factors and options in the hierarchical method are connected hierarchically in a unilateral relationship from top to bottom, whereas the bilateral relationship in analytical network technique with possible interrelationship between the factors and sub-factors relationship can be detected. Since the organizational criterion is influenced by other criteria, the researcher decided to use both methods. It is worth noting that the final method is a combination of both.

According to the obtained special vector drawn from the analytic hierarchy process, the incompatibility rate is 0.04, in which the third option has gained the highest weight, indicating the most optimum solution (Table 11).

Table 11. The special vector of solution options in the analytic hierarchy method

Alternatives	A1	A2	A3
Special vector	0.264	0.34	0.396

According to the obtained data drawn from the analytical

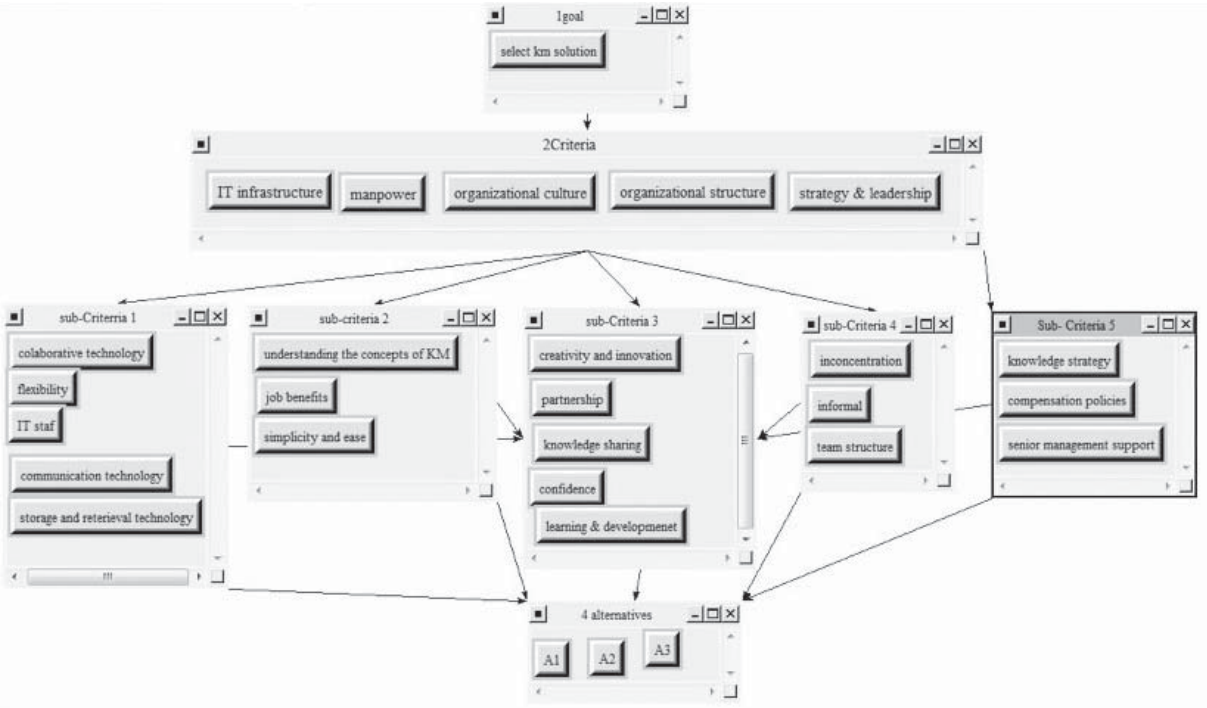

Figure 4: The presented model under the analytical network process

network process (Table 12); once again, the third option has acquired the maximum weight, indicating the most optimum solution.

Table 12. The special vector of solution options in the analytical network method

Name	Ideals	Normals	Raw
A1	0.66640	0.287271	0.085796
A2	0.653958	0.281806	0.084163
A3	1.000000	0.430923	0.66640

7. RESULTS AND DISCUSSION

To sum up, the present study compatible with other findings concluded that, infrastructure factors of information technology, organizational culture, organizational structure, the leadership and strategy as well as manpower are not equally effective in the establishment of knowledge management defined in terms of the above-mentioned priority at Payam Nour University in Golestan province. Communication technologies and saving and maintenance technologies are detected as the most effective sub-factors in terms of order. Considering the components of knowledge management, derived from Ramhard model, the research finding shows that seven presented components have unequal effect on the process of knowledge management in this organization. Consequently, the components of sharing knowledge and saving and maintenance of knowledge are the most effective ones.

Due to the same results drawn from the analytic hierarchy process and analytical network process, the reliable solution in terms of the solution options is the third one. It is worth mentioning that each one of above-mentioned solution, in case of implementation, should include a component of knowledge management regarding the amount of its impact, and also the combinational model of the analytic hierarchy process in which the analytical network process is an appropriate model for the establishment of knowledge management at Payam Nour universities in Golestan province (Figure 4).

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