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Identification of Success Critical Factors in Communities of Practice of International Telecommunication in Iran

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Abstract: This study aimed to identify the critical success factors in Communities Of Practice (COP) of International Telecommunication Union (ITU) in Iran and also to determine the status of each factor from the viewpoints of members. For this purpose, a set of factors were collected, based on previous studies, and were presented to practitioners and experts of knowledge management field. After the analysis of these factors, fourteen factors were selected as the critical success factors in COPs of ITU. Then, a questionnaire was designed and distributed among the study groups of these communities to determine the status of the mentioned factors. Validity of the questionnaires was confirmed by the experts and the reliabilities were estimated to be 0.74 and 0.72 for the first and the second questionnaires, respectively. The data were analyzed in two descriptive and inferential stages. In inferential stage, K-S test, Binomial test and t-tests were used and factors were ranked according to their weighted averages. Results revealed that motivational mechanism, announcing the achievements for all members of the organization, keeping a continuous and regular connection, building solidarity and subscriber identity among members of COP, dividing the goals to smaller issues, mutual trust among members, use of technology, determining the strategic orientations and goals, leader, high levels of interpersonal skills among the members, holding in person meetings, support of chief manager, utilizing the best external experiences and periodic assessment of members' performance were the fourteen critical success factors in COPs among which supports of chief managers, motivational mechanisms, mutual trust among members and building solidarity and subscriber identity among COP members were showed to be more important.

Key words: Communities of practice, critical success factors, support, technology, management knowledge

INTRODUCTION

The occupations today are faced with complex interactions in most industrial and non-industrial sectors. The fact is that in many resources (e.g., training) everything is changing fast. Formal instructions and trainings to members of organizations are generally being held once or twice a year which is not enough for them to attain the experience and knowledge needed to be successful in their careers. Indeed, organizations and investors must change the formal instructions into informal learning (Buckley and Giannakopoulos, 2007). Knowledge sharing among the members, particularly in communities of practice is a very useful way for increasing the knowledge level in an organization. Knowledge sharing can help new members to keep up with the older ones in knowledge and experiences regarding their career. COPs are informal structures in organizations that connect the members for sharing their knowledge and experiences. COPs are part of knowledge management strategies and are highly effective in increasing the achievements of organizations. One of the reasons why COPs are being such useful is that knowledge cannot be taken away from its bed. Unlike formal structures and policies of COPs, most of the organizations are using these communities as a strategic instrument to create and share knowledge in their organization (Wang *et al*., 2008).

Generally, before industrial era, communities were a place for individual relationships and gathering. However, then with growth of industrialization and importance of knowledge, these communities turned into places for sharing and communicating knowledge and experiences (Buckley and Giannakopoulos, 2007). Communities can be

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defined as a collection of individuals who have common interests and concerns and work together for learning together. The term community of practice was introduced as a part of social theory of learning in practice. COPs have different definitions. Some define it as a style of learning that incorporates active components of active participation, identity and situation (Iaquinto *et al*., 2011). defined COPs as individuals who share a concern and passion (Cross *et al*., 2006). These interactions are important arena for innovation where members of the organization continuously adjust and adapt their behaviors (Probst and Borzillo, 2008).

Regarding the potential of COPs for identifying strategic advantage, organizations should focus their attention on the role that the alternative mechanisms can play in directing these informal structures. Consequently, through COPs, organizations can develop their human resources and develop better practices. Thus, measures must be taken to motivate members to continuously participate in these networks and to actively direct these communities. Few studies have explained how to direct the COPs. This shows lack of supervision mechanisms over leading and directing the COPs (Probst and Borzillo, 2008). Therefore, because COPs are useful and effective mechanisms for knowledge sharing in organizations, the success of these communities will lead to the success of the organization. Study groups of ITU are also a kind of COP. Individuals, regardless of their job and profession, become members of their favorite groups. In these communities, members share their knowledge and experiences in their workplace and answer some related questions using their experience and knowledge from their work career. Sometimes these questions are novel and have never been used in other countries. In such cases, members try to give a novel answer through negotiating their experiences from different countries. However, the question that arises is that what are the critical success factors that can help these communities to improve their efficiency? The concept of critical success factors was first introduced by Ronald Daniel in Mckinsey and Company in 1961. Rockart believed that if the critical success factors are identified and are controlled, successful steps can be taken toward improvement of abilities and toward success (Chen and Hsiang, 2007).

Critical success factors are limited numbers of components that must be present for the success of an organization to be imminent. They are managerial and organizational areas that must be under careful attention continuously for the desirable performance of the organization. Critical success factors are critical issues for current activities and future success of the organization and the failure or success of the organization is dependent on these factors. Critical success factors can be obtained from a number of different sources, all of which are important for the success of the organization. Rockart introduced 5 important sources, namely, the industry in which the organization is working in, the rivals, the environment of the organization and the barriers and challenges of the organization and management levels (Rockart, 1984). Shah *et al*. (2003) introduced environmental change, developmental stage of organization, managerial team, growth stages of organization, size of the organization and the kind of strategy implemented in organization as the critical success factors. In a study on critical success factors of electronic banking, it was shown that to identify the critical success factors accurately, firstly, there should be a clear examination of environment, conditions and rivals of the organization. Secondly, factors must be selected that can create significant and measurable differences in organization. Thirdly, factors must be identified that have great impact on organization performance and in fact play a major role in success of the organization. Finally, those factors must be identified that are controllable. In this condition it can be said that critical success factors are identified. Probst and Borzillo (2008) has introduced the factors determining the measurable goals and strategic orientations, periodic assessment and utilizing the best external experiences as the specific scale for members of COPs. In another study, a leader was stated to be an important success factor. In fact, a leader can improe the interactions and relationships among the members that can lead to increase of the knowledge share. Announcing the achievements of the organization and holding in person meetings are also stated to be important critical success factors. In another review, 48 leaders identified the chief managers' support as a very important factor in COPs' success (Borzillo, 2009). Other factors like presenting motivational mechanisms, building solidarity and subscriber identity among members of the community, mutual trust, using technology and holding regular and continuous connections are also said to be very important factors (Rue, 2008) in this study, regarding the previous studies and elimination of repetitive factors, 14 factors were identified as the critical success factors to answer the question of this study: what are the roles of critical success factors in success of communities of practice of International Telecommunication Union in Iran?

Table 1: Number of distributed and filled questionnaires in different organizations

Organization /company	No. of distributed questionnaires	No. of filled questionnaires
Communications Regulatory Authority	18	14
Telecommunication Infrastructure Company	12	9
Iranian Space Agency	5	4
Information technology company	10	8
Total	45	35

MATERIALS AND METHODS

The design of this study was descriptive analytic and because of its goal, it was considered an applied research. This study was done in two stages. The participants of the first stage were experts and practitioners of knowledge management and information technology professors of Tehran University, Iran. The participants of the second stage were leaders and members of study groups in organizations and other companies, all of which were working in ICT field. In the first stages, the experts were asked to introduce other individuals who have related activities. Indeed, snowball method was used and finally 25 experts and professors responded to questionnaires.

Firstly, the questionnaire was given to experts and professors and according to the responds 14 factors were selected as critical success factors in COPs of ITU. Afterwards, another questionnaire was designed and distributed among members of study groups of ITU in Iran to evaluate the status of each factor. In fact, the second questionnaire was designed to see to what extent are these factors being used in the studied organization. The number of questionnaires that were distributed and filled is shown in Table 1.

The validity of the questionnaires was investigated and approved by experts and professors. Cronach's alpha was used to estimate the reliability of the questionnaires.

Cronbach's alpha coefficients estimated to be 0.74 and 0.72 for first and second questionnaires, respectively. Accordingly, the questions were internally consistent and there was no need to remove or adjust the questions. After investigating the distribution normality of the data using K-S test, T-test and Binomial tests were used. Then the factors were ranked regarding their weighted scores.

RESULTS AND DISCUSSION

The descriptive results in first stage of the study showed that 60% of the respondents were MA graduates and 40 % had PhD. The most common field of study among the respondent was management (40%). About 48% of the respondents' work experience in IT field was under five years. In the second stage, 66% of the respondents had MA degree. The field of study of the 54% of them was power engineering and had at most 10 years of experience in IT. 40% of the participants were leaders and 60% of them were normal individuals. 57% of them are members of these study groups less than 3 years shown in Table 2.

For inferential analysis of the data a questionnaire was designed and distributed among experts and professors. The questionnaires used a likert scale. The data were first investigated to be normally distributed using K-S test. However, this test did not determine all variables and thus the non-parametric Binomial test was used for inferential analysis of the data. According to the results of this analysis 14 critical success factors were identified and introduced shown in Table 3.

After identification of the critical success factors, their implementation in groups and study groups was investigated. From the viewpoint study groups, some factors are not that effective and may not be regarded as critical success factors. Such factors were motivational mechanisms, announcing the organization achievements among members, holding regular and continuous connection, building solidarity among members, dividing the goals in to smaller issues, mutual trust and use of technology.

On the other hand, they believed in the effectiveness of high levels of interpersonal skills, setting strategic goals and orientations, support of chief managers, in person meetings, utilizing the best external experiences and periodic performance assessment. In order to draw the radar graph, weighted average of the factors were estimated using the following formula (Eq. 1):

$$x_w = \sum_{i-1}^{k} w_i x_i \quad 0 < 1, \sum_{i-1}^{x} = 1 \; i = 1,2,...,k \qquad (1)$$

For this purpose, firstly, the absolute and relative frequencies of each items of the questionnaire were extracted. The weighted average is the sum of relative frequencies multiplied by the value of item. Then, the total weighted averages are calculated and divide it by weighted score of each factor to have the weight of each factor. In fact, this weight indicates the importance of each factor from viewpoints of experts and professors. According to the result, the difference between the weights of factors is very small and some factors are ranked in the same ranking shown in Table 5 and Fig. 1.

Table 2: Information of groups and communities in different groups and organizations

Title of the sector	Title of the groups	Title of organization/company
ITU-T	Group 17: security	Information technology companytelecommunication infrastructure company
	Group 11: Signaling and protocol	telecommunication infrastructure company
	Group 13: future generation networks	
	Group 5: environmental and atmospheric changes	Telecommunications regulatory authority
	wtsa	telecommunications regulatory authority
ITU-R	Group 1: spectrum management	Telecommunications Regulatory Authority
	Group 2 : propagation of radio waves	
	WRC	
	Group 4: Space services	Iranian space agency
ITU-D	WTDC	Iranian space agency

Table 3: Determining the critical success factors

Critical success factor	K-S test significance level	Result	Test type	Significance level	Results
Setting strategic goals and orientations	0.047	Not normal	Binomial	0.000	NHR*
Support of chief managers	0.001	Not normal	Binomial	0.000	NHR
Motivational mechanisms	0.001	Not normal	Binomial	0.000	NHR
Mutual trust	0.002	Not normal	Binomial	0.000	NHR
High level of interpersonal skills	0.000	Not normal	Binomial	0.000	NHR
Holding regular and continuous connection	0.041	Not normal	Binomial	0.000	NHR
In person meetings	0.004	Not normal	Binomial	0.000	NHR
Use of technology	0.022	Not normal	Binomial	0.000	NHR
Creating solidarity among COP members	0.011	Not normal	Binomial	0.000	NHR
Leader	0.128	Not normal	One sample t-test	0.000	NHR
Dividing the goals into smaller issues	0.069	Not normal	One sample t-test	0.000	NHR
Utilizing the best experiences out of COP field	0.067	Not normal	One sample t-test	0.000	NHR
Periodic performance assessment	0.068	Not normal	One sample t-test	0.000	NHR
Announcing the achievements	0.068	Not normal	One sample t-test	0.000	NHR

Table 4: Status of each critical success factors in study groups from viewpoint of leaders and individual members

Critical success factor	K-S test significance level	Result	Test type	Significance level	Result
Support of chief managers	0.051	Not normal	One sample t-test	0.001	NHR
Dividing the goals into smaller issues	0.102	Not normal	One sample t-test	0.831	NHR
Utilizing the best external experiences	0.109	Not normal	One sample t-test	0.006	NHR
Periodic performance assessment	0.109	Not normal	One sample t-test	0.000	NHR
Mutual trust	0.056	Not normal	One sample t-test	0.310	NHR
Use of technology	0.268	Not normal	One sample t-test	0.152	NHR
Setting strategic goals and orientations	0.007	Not normal	Binomial	0.001	NHR
Motivational mechanisms	0.000	Not normal	Binomial	0.100	NHA*
High levels of interpersonal skills	0.000	Not normal	Binomial	0.000	NHR
Regular and continuous connection	0.025	Not normal	Binomial	0.062	NHA
In person meetings	0.014	Not normal	Binomial	0.000	NHR
Building solidarity among members	0.021	Not normal	Binomial	0.573	NHA
Announcing the organization	0.007	Not normal	Binomial	0.000	NHA
Leader	0.007	Not normal	Binomial	0.058	NHR
achievements among members					

NHA: null hypothesis approved

Table 5: Ranking of the critical success factors regarding their weighted averages

Rank	Factor	Weighted average
1	Support of chief managers	4.6
	Motivational mechanisms	
2	Mutual trust	4.48
3	Building solidarity among members	4.4
4	Setting strategic goals and orientations	4.32
5	Announcing the organization	4.24
	achievements among members	
6	Utilizing the best external experiences	4.08
7	High levels of interpersonal skills	4.2
	Use of technology	
8	Holding regular and continuous connection	4.12
9	In person meetings	4
10	Periodic performance assessment	3.88
11	Leader	3.84
12	Dividing the goals into smaller issues	3.64

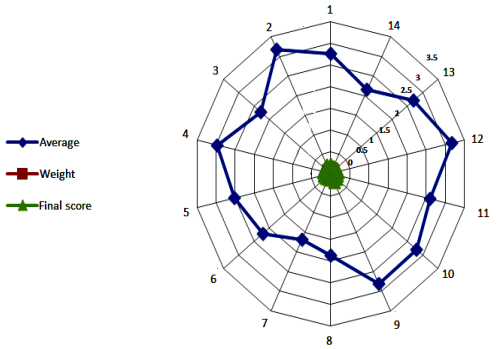

Fig 1: Radar graph of critical success factors in COPs of ITU in Iran

CONCLUSION

In this study, 14 critical success factors were identified which are as follows: motivational mechanism, announcing the achievements for all members of the organization, keeping a continuous and regular connection, building solidarity and subscriber identity among members of COP, dividing the goals to smaller issues, mutual trust among members, use of technology, determining the strategic orientations and goals, leader, high levels of interpersonal skills among the members, holding in person meetings, support of chief manager, utilizing the best external experiences and periodic performance assessment. The results of this study are in line with ShamiZanjani and Alami. They emphasized on presence of a leader in COPs. They also mentioned the factors announcing the organization achievement among members and holding in person (face-to-face) meetings as critical success factors. Popbst and Borzillo (2008) introduced setting measurable strategic goals and orientations, periodic performance assessment and utilizing the best external experiences as critical success factors. Borzillo (2009) highlighted the importance of chief managers' support as an important critical success factors. Rue (2008) identified motivational mechanisms, building solidarity among members, mutual trust, and use of technology and holding regular connection as critical success factors in COPs. Thus, the current study has confirmed the findings of previous studies. All in all, the study tried to provide sufficient information to help COPs or similar communities and groups in Iran, though there are only a few of such communities in Iran. It is recommended to other scholars and students to do studies in this field so they may find more interesting or different results. It is also recommended to managers and experts of this field to use factors like motivational mechanism such as rewards or other advantages and building trust and solidarity among members to have a great influence on improvement and promotion of communities of practice.

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