

## Identification and Classification of Factors Affecting ICT Knowledge Workers' Turnover in Iran's Mobile Communications Industry

Mohammad Reza Mehregan and Nader Seyed Kalali  
Faculty of Management, University of Tehran, Tehran, Iran

**Abstract:** The purpose of the present research is identification and classification of factors affecting ICT knowledge workers' turnover in Iran's mobile communications industry. After reviewing research literature, seeking experts' opinions and doing statistical analyses, 11 variables were identified as the main turnover precedents; then using exploratory and confirmatory factor analysis, the aforementioned factors were classified in three categories. Results of the research suggest that the personal, job-related and internal/extra-organizational aspects, respectively, explain ICT specialists' and knowledge workers' turnover in Iran's mobile communications industry.

**Keywords:** Factor analysis, ICT knowledge worker, mobile communications industry, turnover,

### INTRODUCTION

Mobile communications industry is one of the leading industries in today's world. Nowadays mobile phones have turned into an inseparable part of people's lives. The use of mobile phones encompasses a wide range of activities including contacting friends and relatives, settling work issues, making emergency calls, sending and receiving SMS, connecting to the Internet, listening to music, playing games, advertising, reading news, entertainment, banking, etc. and its uses are increasingly expanding.

Despite the passage of three decades since the launch of first mobile telephone network, the number of mobile phone users in the world prior to the end of the year 2009 reached 4.6 billion people. The number of mobile phone users today is 370 times more than the number of consumers of this device in 1990 (Heeks, 2008). Under conditions prevailing in this industry, one of the most important concerns of organizations is attracting and keeping knowledge workers and productive human resources. Due to existence of a wide range of job opportunities and knowledge of the specialists which is in demand, personnel turnover rate in this industry is extremely high (Shoaib *et al.*, 2009) and the cost created by workforce turnover and their probable employment at rival organizations cannot be overlooked; therefore, it is necessary that organizations should adopt suitable strategies for keeping human resources in order to reduce employee turnover and keep the employees in the organization; however, to adopt such strategies, in the first step, the reasons for turnover must be identified so that by knowing them, it would be possible to plan more effectively for the retention of knowledge workers. So, in this study,

researchers aimed at Identifying and Classifying of Factors Affecting ICT Knowledge Workers' Turnover in Iran's Mobile Communications Industry.

### LITERATURE REVIEW

Various definitions of turnover have been provided. Employee turnover is rotation of the personnel in the labor market; among companies, jobs and professions; and between employment and unemployment (Abassi and Hollman, 2000). Employee turnover has been defined by Price (1977) as follows: The ratio of the employees of organization who left in a particular period of time to the average number of employees in that organization during the same period of time. Whenever a position of an organization is vacated, a new employee must be hired and trained. This replacement cycle is called employee turnover.

Studies have shown that turnover is a serious challenge for organizations and different organizations use various approaches to keeping their personnel (American Management Association, 1997). Plans for keeping personnel begin with employing the right people and continue with providing conditions which enhance their commitment to the organization. From the viewpoint of organization, employee turnover is a costly issue. Voluntary turnover represents the loss of organizations human capital and future replacement of these employees will inflict different expenses on organizations. Many researchers argue that if high turnover rates are not managed properly, they can have negative effects on profitability of organizations (Wasmuth and Davis, 1983). Some researches show that turnover of high performers has a negative relationship with organization's effectiveness and success (Holtom *et al.*, 2005).

So far numerous studies have been conducted in order to explain the reasons for the phenomenon of turnover and many variables have been enumerated as employee turnover precedents. One of the first studies for explaining the phenomenon of turnover was March and Simon (1958) research and after that many studies were conducted to explain voluntary turnover (Blau and Boal, 1989; Hom and Griffeth, 1995). Some of these studies have dealt with personal factors of turnover (Tett and Meyer, 1993), some have referred to the role of occupational factors (Lambert *et al.*, 2001) and a number of them have also paid attention to the organizational factors affecting turnover (Harter *et al.*, 2002). Peterson (2004) has classified turnover models and theories in three categories: models that focus on the process of turnover, socialization models and comprehensive models. In another research, Zheng and Lamond (2010) have divided these models into four categories: process models, socialization models, expanded models and “shocks” model.

Number of turnover theories and models is considerable but the need for research on the issue of turnover among ICT knowledge workers in new

industries such as mobile communications is deeply felt. In one of the rare studies conducted in the mobile communications sector in Pakistan, career development opportunities, work environment, benefits and work/life policies were identified as the most important factors related to employee retention and turnover (Shoaib *et al.*, 2009). This study was conducted among 130 personnel in mobile communications industry in Pakistan. Ghapanchi and Aurum (2010) considered personal, job-related, environmental, organizational and psychological factors as those affecting information systems experts’ turnover. According to the results of this research, within the literature of turnover, among personal factors, most reference has been made to organizational tenure, age, educational level and gender; next to these, career orientation has been mentioned as having less effect compared with the abovementioned factors. Among organizational factors, salary has been mentioned more frequently within the literature and after that, with a lower degree of effect, factors of fairness in reward and promotability have been mentioned. Out of occupational factors affecting IT experts’ turnover, the factors of role conflict, role

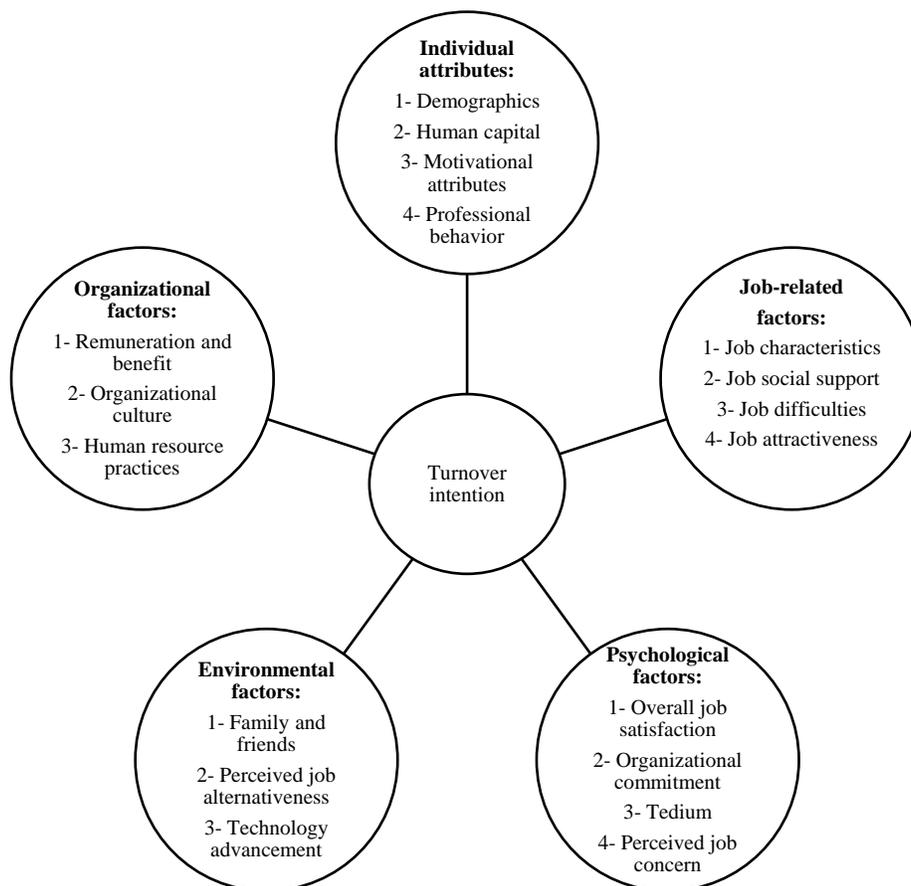


Fig. 1: Precedents of IT employees’ turnover (Ghapanchi and Aurum, 2010)

Table 1: List of factors affecting IT and ICT knowledge workers' turnover in Iran's mobile communications industry

1. Age	2. Educational level	3. Organizational tenure	4. Gender
5. Career orientation	6. Salary	7. Role conflict	8. Role ambiguity
9. Task autonomy	10. Workload	11. Task variety	12. Job feedback
13. Boundary spanning activities	14. Job satisfaction	15. Career commitment	16. Career satisfaction
17. Emotional exhaustion	18. Job alternatives	19. A bad boss	20. Fairness in reward

ambiguity and task autonomy have been more frequent than others and next to them, factors of perceived workload, task variety, job feedback and boundary spanning activities are the most frequent factors within the literature. Among psychological factors affecting IT experts' turnover, job satisfaction and occupational commitment have been more frequently mentioned than others; and next to them the two factors of career satisfaction and emotional exhaustion, with a lower degree, affect IT experts' turnover. Among environmental factors, job alternatives are the most frequent within the literature (Ghapanchi and Aurum, 2010).

Unfortunately, the number of studies conducted on determinants of IT and ICT experts' turnover are scarce. Studies of Joseph and Ang (2003), Niederman *et al.* (2006) and Joseph *et al.* (2007) are among these researches. For example, Joseph *et al.* (2007) research includes a study of 33 papers and in their study 43 precedents of IT employee turnover were identified. On the whole, the most comprehensive study on factors affecting IT employee turnover has been conducted by Ghapanchi and Aurum (2010). By studying 72 published papers including both quantitative and qualitative studies, they identified 70 factors affecting IT experts' turnover. In Fig. 1 a list of these factors is identifiable:

After reviewing the literature, identified factors were presented to the experts; then 20 factors which had a higher repeatability and frequency in various studies and were considered as important in Iran's business environment by the experts were selected. These factors were identified as the initial list of factors affecting IT and ICT knowledge workers' turnover in Iran's mobile communications industry. Table 1 presents a list of these factors.

### RESEARCH METHODOLOGY

The purpose of this study is identifying factors affecting ICT knowledge workers' turnover in Iran's mobile communications industry. In this regard, first key factors were identified through reviewing the literature and seeking experts' opinions; after that designed questionnaires were distributed among managers and consultants active in the industry and then they were collected. The obtained results were subjected to statistical analysis that is; insignificant cases were eliminated and the remaining factors were classified using exploratory and confirmatory factor analysis and the conceptual model of factors affecting

ICT knowledge workers' turnover in mobile communications industry was obtained. Data analysis was conducted by using SPSS 15 and LISREL software. The study was conducted during 2011-2012 in Iran.

### RESEARCH INSTRUMENT

As mentioned, after extracting the factors affecting knowledge workers' turnover from the literature, based on the frequency of the variables repeated within the literature, 19 factors were identified; then by interviewing some of the experts in the mobile communications industry, apart from the aforementioned factors, 1 other factor (bad boss) was added which on the whole formed a collection of 20 factors. The large number of these variables and the need for reducing and classifying them required that a questionnaire be designed and experts be consulted.

The designed questionnaire contained 20 questions in which Likert scale had been used. The questionnaire was first examined by the experts; then 30 initial samples were distributed and possible ambiguities and shortcomings were removed. Among organizations with which the experts who were interviewed have cooperated are Hamrah-e-Avval (MCCI), Irancell, Nokia Siemens, ZTE and Huawei. It is noteworthy that in order to implement the research, 220 questionnaires were distributed out of which 203 questionnaires were completed. In order to test reliability of the questionnaire Cronbach's alpha was used; the value of Chronbach's alpha was obtained 0.76.

### RESULT ANALYSIS

**Results of one sample test:** Using one sample test, it was attempted to identify the main turnover precedents from the viewpoint of the experts. Therefore, for all the 20 identified factors, the following two hypotheses were developed and examined:

- H<sub>0</sub>:** According to the experts, factor x ( $0 \leq x \leq 20$ ) is of high importance.
- H<sub>1</sub>:** According to the experts, factor x ( $0 \leq x \leq 20$ ) is not of high importance.

It must be noted that considering the Likert scale used in the questionnaire for examining the importance of the factors affecting turnover rate, factors with a score higher than 3 or 60% were deemed important

Table 2: The results of one sample test for research variables

	One sample test (test value = 3)				95% confidence interval of the difference	
	t	df	Sig. (2-tailed)	Mean difference	Lower	Upper
Age	13.072	201	0.000	1.079	0.92	1.24
Educational level	16.631	202	0.000	1.236	1.09	1.38
Organizational tenure	11.318	201	0.000	0.921	0.76	1.08
Gender	13.839	201	0.000	1.050	0.90	1.20
Career orientation	-12.603	202	0.000	-0.911	-1.05	-0.77
Salary	32.991	200	0.000	1.473	1.38	1.56
Role conflict	-6.179	201	0.000	-0.510	-0.67	-0.35
Role ambiguity	2.803	201	0.006	0.188	0.06	0.32
Autonomy	-6.752	201	0.000	-0.545	-0.70	-0.39
Workload	-12.191	202	0.000	-0.867	-1.01	-0.73
Task variety	4.114	199	0.000	0.280	0.15	0.41
Job Feed back	-5.463	202	0.000	-0.443	-0.60	-0.28
Role spanning activities	-6.110	202	0.000	-0.468	-0.62	-0.32
Job satisfaction	6.900	202	0.000	0.621	0.44	0.80
Career satisfaction	-5.827	201	0.000	-0.569	-0.76	-0.38
Job commitment	-5.917	202	0.000	-0.567	-0.76	-0.38
Emotional exhaustion	-7.461	201	0.000	-0.733	-0.93	-0.54
Job alternatives	19.597	201	0.000	1.277	1.15	1.41
A bad boss	11.873	200	0.000	0.910	0.76	1.06
Fairness of the reward	35.906	202	0.000	1.468	1.39	1.55

Table 3: Total variance explained

Component	Initial eigenvalues			Extraction sums of squared loadings			Rotation sums of squared loadings		
	Total	% of variance	Cumulative %	Total	% of variance	Cumulative %	Total	% of variance	Cumulative %
1	3.454	31.401	31.401	3.454	31.401	31.401	3.288	29.892	29.892
2	1.874	17.034	48.435	1.874	17.034	48.435	1.928	17.527	47.419
3	1.540	13.998	62.433	1.540	13.998	62.433	1.652	15.014	62.433
4	0.951	8.644	71.077						
5	0.879	7.991	79.068						
6	0.770	6.999	86.067						
7	0.453	4.119	90.186						
8	0.403	3.662	93.849						
9	0.323	2.938	96.786						
10	0.240	2.179	98.965						
11	0.114	1.035	100.000						

Table 4: Rotated component matrix

	Component		
	1	2	3
Age	0.924	-0.106	0.031
Educational level	0.586	0.197	0.172
Organizational tenure	0.787	-0.158	0.106
Gender	0.863	-0.117	0.048
Salary	0.057	0.006	0.842
Role ambiguity	-0.055	0.885	-0.019
Task variety	-0.138	0.885	-0.051
Job satisfaction	0.828	0.071	0.028
Job alternatives	0.056	0.046	0.409
A bad boss	0.061	0.513	0.068
Fairness of the reward	0.089	-0.059	0.850

Thus, the hypotheses of this section of the research have been designed mathematically as follows:

$$H_0 : \mu = 3$$

$$H_1 : \mu \neq 3$$

One sample test was conducted for all research variables, the results of which are as presented in Table 2.

The results show that out of the twenty factors under study, eleven factors of age, educational level, organizational tenure, gender, salary, role ambiguity, task variety, job satisfaction, job alternatives, bad boss and fairness of reward are considered important.

**Results of exploratory factor analysis:** In order to conduct factor analysis, first using KMO index and Bartlett's test we made sure whether the number of data is suitable for factor analysis. Value of KMO index was 0.696 and significance of Bartlett's test statistic was lower than 5%, which confirms that factor analysis is suitable for investigating the issue under study.

The results of factor analysis (Table 3 and 4) show that the obtained model explains 62.43% of ICT knowledge workers' turnover in Iran's mobile communications industry.

The results of exploratory factor analysis suggest three categories. In regard to the variables comprising each category, factors affecting turnover were classified under the titles of personal, Job-Related and internal/extra-organizational aspects (Table 5).

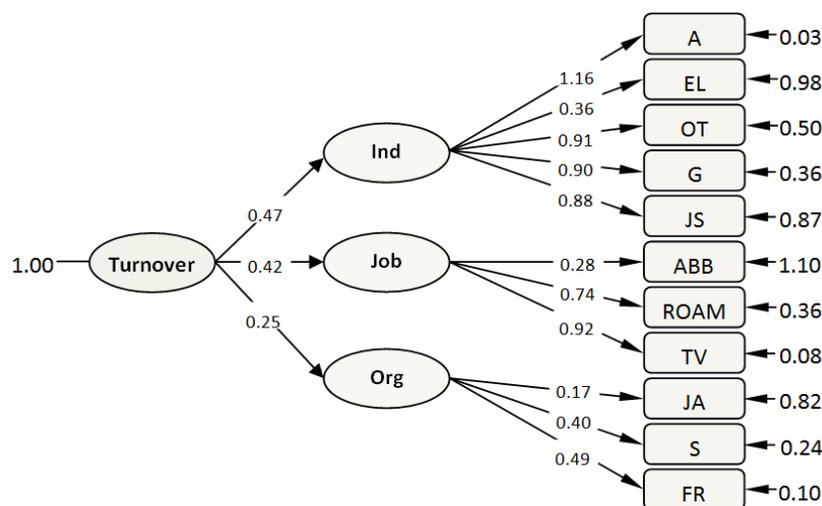


Fig. 2: The model of ICT knowledge workers' turnover in Iran's mobile communications industry  
 $\chi^2$ : 88.44; df: 41;  $\chi^2$ /df: 2.157; GFI: 0.88; AGFI: 0.58; RMSEA: 0.076

Table 5: Classification of variables in three categories of personal, job-related and internal/extra-organizational aspects

Variables	Aspects
Age	Personal
Educational level	Personal
Organizational tenure	Personal
Gender	Personal
Job satisfaction	Job-related
Role ambiguity	Job-related
Task variety	Job-related
Bad boss	Job-related
Salary	Internal/extra-organizational
Job alternatives	Internal/extra-organizational
Fairness in reward	Internal/extra-organizational

**Results of confirmatory factor analysis:** Figure 2 is the model obtained from exploratory factor analysis and shows the factors affecting turnover in the form of personal, job-related and internal/extra-organizational aspects.

RMSEA value is 0.076 and the GFI and AGFI are respectively, 0.88 and 0.58. Also, value of Chi-square statistic is 88.44 and degree of freedom is 41; therefore, the ratio of Chi-square to degree of freedom is 2.157 which is less than 3, thus it is inferred that the obtained model is suitable.

### CONCLUSION

The aim of the policies for retention of employees is to keep main employees at the organization and to decrease rotation and loss of employees, which is futile and costly (Armstrong, 2008). Employees are among the most important success factors of any business and therefore, they must be motivated and kept at the

organization at any price so that the organization may be able to enter global competition based on provision of high-quality products and services. It should be noted that in the long term, investment on the employees is reversible.

In the present research, factors affecting ICT knowledge workers' turnover in Iran's mobile communications industry have been studied. By reviewing the literature of the subject and seeking experts' and specialists' opinions, 20 variables were obtained as the variables affecting turnover and the results of exploratory and confirmatory factor analysis classified these variables, in order of importance, in the form of personal (0.47), job-related (0.42) and organizational (0.25) aspects. The results also indicate that the most important turnover precedent is the personal factor; therefore, organizations must pay due attention to the personnel recruitment phase so that they may recruit those knowledge workers who are less prone to turnover in the future.

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