

STUDY OF FACTORS INHIBITING ESTABLISHMENT OF TELEWORKING SYSTEM IN IRANIAN PUBLIC SECTOR

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Abstract

In today's networked economy, the effectiveness of traditional methods of working is reduced day by day. The usual method of employment due to changes in technology is rapidly being merged. Besides, Internet and other information and communication technologies create the possibility so that the group work can be organized without geographical limitation. This method which is made possible by information and communication is known as telework.

Teleworking is a kind of arrangement which is flexible in terms of time (part time or full time), and the location (home, remote sites or mobile form) for an employee to do his tasks and pay his duties. Although, there are numerous benefits associated with teleworking, achieving these benefits mainly depends on successful deployment of this system. Organizations which have implemented this system show that significant preventing factors are involved in implementing this system. Therefore, the present study tries to investigate the "factors preventing the establishment of telework in public sector System of Iran". The present research is applied and descriptive in nature, regarding the goals and methods. The participants in this study were managers and staff experts of public sectors of ministries in Iran (except the Ministry of Information, defense, justice, Interior, and foreign). To identify the barriers of telework systems and determine their importance, two types of tailor-made questionnaire were utilized; the main questionnaire involves the identification of factors, and the second one is the experts' survey for ranking the factors. In this study first, the preventing factors of telework system were identified,

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using factor analysis techniques, and then the barriers were weighed and ranked through Multiple Criteria decision Analytical Hierarchy Process (AHP) techniques. Finally, data were analyzed and recommendations were proposed based on the result.

This model has six indicators of weakness; change management, lack of environmental contexts, mechanisms and operational inefficiencies, poor orientation and organization, lack of employees' knowledge and expertise, and lack of motivation and desire among staff. This model has been developed for the first time in Iranian public sectors.

The results of this study can benefit managers of administrative units to better understand preventing factors. Moreover, it can help them to make decision for teleworking systems management, and increase the productivity of the organizations.

KEYWORDS: Telework, preventing factors, endogenous factors, exogenous factors, factor analysis, Analytical Hierarchy Process (AHP).

Introduction

Philosophy of teleworking is summarized in this statement: "instead of bringing employees to workplace, bring workplace to them". Traditional patterns of work method, work place, work time and organizations are deteriorating. Teleworking is a method for doing job and is a result of accelerated pace of information and communication technology (ICT) spread. Teleworking means to work outside of organization, office and/or firm at any time and place employing ICT (Abbasi, 2004).

Today, ICT shifts the world towards integration and hardly a science field may be found which is not penetrated by its influence and domination. As a result of this, employment and social relations also have been changed fundamentally and these in turn have resulted in increased pace of doing work, time and cost saving and also decrease in unnecessary travels. Progress in ICT, has facilitated inter-personal and inter-organizational interactions even more and changed traditional concept of work from both temporal and spatial viewpoints. Teleworking is also an effective measure in order to reduce travel volume and transportation demand. Though there are other reductive measures e.g. teleeducation, telebanking, using internet in business interactions, e-government and telebuying now being used and implemented, but teleworking

should be used as a complement together with e-government and telebanking in Iran because specific working nature of this country so that it can exert its effects on society and growing trend of sustainable development (**Pour-Moallem and Reza-pour, 2009**)

Teleworking is not a category specific to present time and recent years. Also in 1950s, a journalist was able to transmit its news report to journal and in the next day receive the printed news through telegraph. But conceptualization, development of idea and creation of theoretical bases began in 1970s for the first time and soon found a special place in management, organizational, informational, relational, social and even environmental discussions and since then, number of teleworkers increased exponentially and continuously and today teleworking category has attracted organizations, firms, governments, institutions and people based on its progress in computational and ICT technologies (**Kelly,1985**).

Term of teleworking has become popular during recent years. In Iran also teleworking circular was enacted by Social Affairs and e-government Commission of Ministers' Board in 2010/06/19 with the aim of increasing productivity, enhancing work flexibility and decreasing staff traffic volume. Realization of such outcomes requires successful design and establishment of teleworking system. Undoubtedly, in implementation of each system, some key factors are influential which type and contribution of each are not known in Iranian public sector (**Khodayari, study of factors inhibiting establishment of teleworking system in Iranian public sector, 2012**).

Teleworking definitions:

Teleworking is a new word representing doing work from home or near the home at an office complex in which employees can access computational resources of main workplace (firm, organization,...) using sophisticated computational and relational equipment. At least one of such an office complex named teleworking centre or regional telecommuting centre is required in every suburb city. In addition to usual office facilities, such equipment include: video-conference systems, PCs, scanners, photocopiers and other office equipment together or separate. In short-term future, teleworking would be probably in the form of working from home. One purpose of teleworking planners is to create a place and a communicational environment at home similar to ones employees have in workplace(**Mamdouhi, 2004**).

Teleworking is a flexible method of work which includes a wide range of working activities and all ones who are able to work outside of employer place or usual working place for a major part of work time. Teleworking can be full-time or part time and often includes electronic processing of information and always involves using telecommunications in order to establish relationship between employer and employee (Gray & et al, 1994).

Conceptualization, development of idea and creation of theoretical bases began in 1970s for the first time and soon found a special place in management, organizational, informational, relational, social and even environmental discussions and since then, number of teleworkers increased exponentially and continuously and today teleworking category has attracted organizations, firms, governments, institutions and people based on its progress in computational and ICT technologies. In 1970s number of teleworkers was small because of such reasons as technological limitations, high costs of information and technology of it, reluctance of firms and organizations to use teleworking and resistance of associations and unions. But in 1980s, teleworking emerged as “the next expected revolution”(Kelly,1985) and continued to growth among employees, employers, transportation planners, societies, telecommunication industry and many other ones (Hendi and Mokhtarian, 1996).

Research Background

According to research literature and related works, it can be said that factors inhibiting teleworking are separatable into two general sorts:

- 1) endogenous inhibiting factors which are due to inappropriate design, establishment and maintenance of teleworking system; and
- 2) exogenous factors which are related to environmental limitations of the system.

Table1. Factors inhibiting establishment of teleworking system

Row	Reference	barriers
1	Naser Pour-Moallem and Mohammad Amin Reza-Pour (2009)	-Lack of training and retraining of human power -lack of telecommunication infrastructure -Lack of re-engineering organizations and executive systems -Lack of required legal bases
2	Pe´rez ,Manuela ,Angel ,Pe´rez.	-Scientific and technical factors: lack of teleworking knowledge, lack of innovation and invention, lack of electronic communication, lack of ICT

	, Martí'nez Sa' nchez. de Luis Carnicer. ,Pilar Jose' Vela ,Mari'a and Jime'nez (2004)	-Human resource factors: organizational resistance, shortage of knowledge-workers, salespersons' knowledge and capability deficiency, lack of skilled staff rotation, lack of training in firm, lack of flexible experiences related to teleworking -Organizational factors: temporary contracts, concentration, lack of outsourcing some of activities, lack of task and activity planning, management, organizational culture, team work, workplace division, retaining contracts -effect of control variables: firm size, gender , tenure, traffic conditions
3	Manuela, Pe' rez Pe' rez., Angel, Martí'nez Sa' nchez., and Mari'a Pilar de Luis Carnicer, (2003)	Capital, management, communications, employees, trust, change, knowledge, managers resistance
4	K. B. and ,Kowalski J. (2005),Swanson	-Lack of support: senior management support, middle management and supervisors support, technical and instrumental support, family support, management training and employee training -lack of communications: formal and informal -lack of trust: managerial trust, employee trust
5	Fan. Ng (2010),Cheuk	-space requirements: place, size, arrangement, open or private space, fixed or shared domain, light, music, noise, outlook view -perceived work pressure -work hours -communications -privacy -access to information
6	Gray,hodson and gordon (1994)	-Psychological factors: lack of adequate understanding, lack of motivation, social isolation, lack of job satisfaction, lack of self-management, work pressure -sociological factors: communication and transportation, group behavior processes, organizational change and culture
7	and Vivien K.G. Lim ,Thompson S.H. Teo (2000)	-work desires and preferences: job insecurity, lack of organizational commitment, -statistical characteristics: gender, marital status -perceived advantages and disadvantages: people, organizations -supporting factors: supervisory support, co-worker support
8	Viviane Illegems*, Alain Verbeke, Rosette S'Jegers (2001)	-environmental factors Technological environment: lack of user access to network, lack of comprehensiveness and spread of network at society level, high cost of ICT

		<p>Formal and institutional environment: lack of required rules and regulations, possibility of discrimination between teleworkers and other organizational staff</p> <p>Organizational environment: organizational structure, lack of outsourcing, lack of access to teleworkers, communications, management style, extent of automation of organizational processes, integration of processes</p> <p>-personal factors:</p> <p>Situational characteristics: job features (job location, job content, extent of job continuity, compatibility of job mobility with existing ICT equipment required to do the job</p> <p>Individual perception and attitude: extent of information and awareness of individual in relation to type of working, extent of employees risk taking, extent of employees flexibility</p>
9	Nelson Oly Ndubisi and Cengiz Kahraman (2005)	Limited workforce, environmental factors, organizational design, work nature, teleworking infrastructure, personal attitudes and costs
10	Ghanbari and Bakhtjou (2011)	<p>-individual barriers: lack of appropriate facilities and resources, reduced social relationships, reduced job communications, tight work conditions, belief of teleworkers that they do not progress and are not promoted, inappropriateness of teleworking from home for some people, necessity of English literacy, having technical ability to use and maintain equipment</p> <p>-organizational barriers: information security requirements, lack of appropriate hardware infrastructure, managerial resistance, problems related to monitoring teleworkers performance, identifying workforce suitable for teleworking, costs associated with preparation of grounds for and implementation of teleworking, incompatibility of some organizational cultures with flexibility required for teleworking, problems related to accessibility of teleworkers in emergencies, impossibility of doing some tasks via teleworking</p> <p>-social barriers: legal and technical conditions of society, lack of necessary cultural and social infrastructures required for teleworking</p>
11	Yehuda Barach and Yuk King Joen Yuen(2000)	<p>-problems related to monitoring employees,</p> <p>-fear of social isolation</p> <p>-necessity of careful planning, attention to technology, legal issues, selection of managers and teleworkers and attention to training</p> <p>-lack of organizational readiness to enforce cultural changes</p> <p>-excessive financial costs for procurement of teleworking equipment</p>

(Khodayari, study of factors inhibiting establishment of teleworking in Iranian public sector, 2012)

Research method

Research questions are as follows:

- 1- What are the factors inhibiting teleworking in Iranian public sector?
- 2- What is the importance ranking of each inhibiting factors?

Present research is a descriptive-field one from methodological viewpoint and an applied one with respect to its purpose. Statistical population of this research consists of managers and professionals of Iranian public sector ministerial headquarters (except for ministries of Defense, Justice, Interior and Foreign Affairs). From each ministry, 25 managers and professionals were randomly selected and research questionnaires were distributed to them, sample volume should be at least 300 subjects because of using exploratory factor analysis. Also in order to rank inhibiting factors, opinions of seven experts from the same ministries were asked so that multi-criteria decision making technique (hierarchical analysis) can be applied.

In order to assess reliability of questionnaire, the related questions were developed based on theoretical bases and similar research works and consultation with honorable professors and in pilot phase, vagueness of questionnaire was removed based on received feedback and after some modifications the main questionnaire was finalized and distributed to selected sample. In order to confirm validity of questionnaire Cronbach α was calculated (0.8049) and demonstrated validity of questionnaire. It should be noted that in questionnaire related to hierarchical analysis, because of using pair wise comparisons, assessment of validity and reliability by statistical tests (Cronbach α) is not required.

- 1- In present study, calculations were generally conducted with respect to two descriptive and deductive aspects. Considering descriptive one, mean, standard deviation, frequency percent and graphs were used and for deductive aspect, exploratory factor analysis was applied to answers of question 1 (what are the factors inhibiting teleworking in Iranian public sector?).
- 3- Before conducting factor analysis using factor analysis statistic, sampling adequacy was examined and supported (0.812). Bartlet test was conducted to ensure that data correlation matrix was not zero in statistical population and factor finding is reasonable. The value obtained for Bartlet test was 2777.013. Then underlying factors were identified using principle component

analysis method and all research questions were loaded by six factors. Thus by conducting factor analysis for questionnaire developed based on theoretical bases and expert opinions, research variables were sorted into six factors and multi-criteria decision making technique (hierarchical analysis) was applied to answers to second question (What is the importance ranking of each inhibiting factors?)

Research results

Based on present research, a model known as “factors inhibiting establishment of teleworking system in Iranian public sector” was developed.

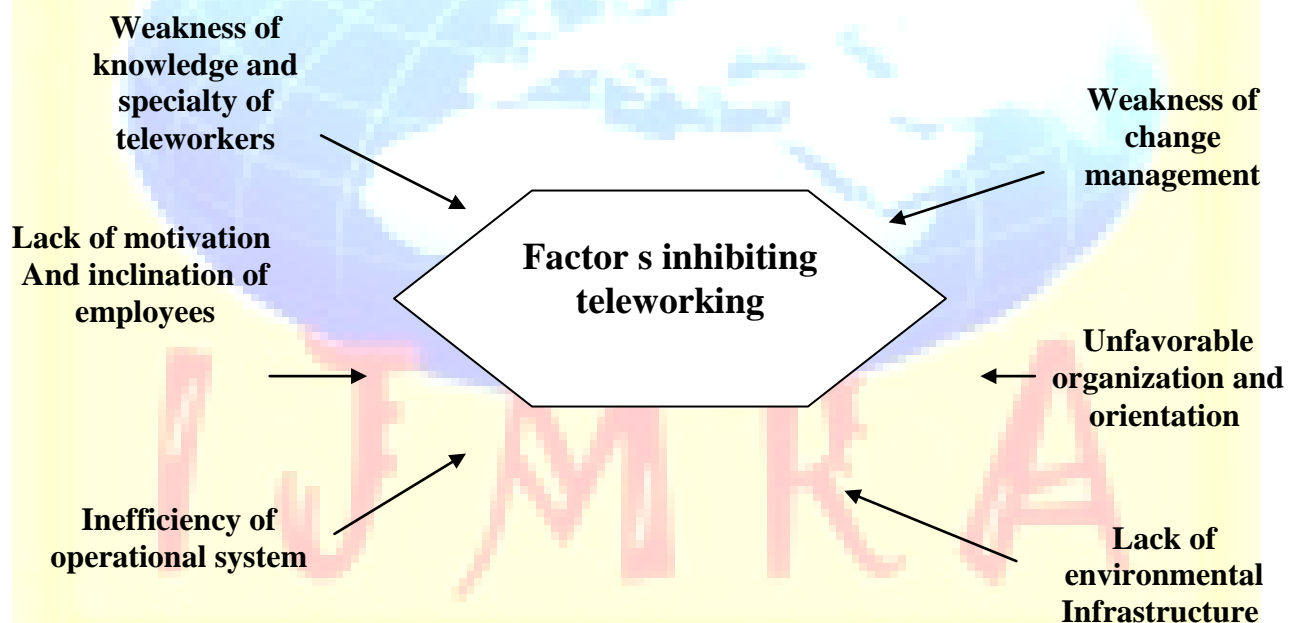


Figure1. Model of factors inhibiting teleworking systems

(Khodayari, study of factors inhibiting establishment of teleworking in Iranian public sector, 2012)

Based on present research, priority of measures is as follows based on their weights:

Table2. Prioritization of measures:

Measure	weight	Final ranking
Weakness of change management	0.422	1
Lack of environmental infrastructure	0.209	2
Inefficiency of operational system	0.163	3
Unfavorable organization and orientation	0.109	4
Weakness of knowledge and specialty of teleworkers	0.053	5
Lack of motivation and inclination of employees	0.045	6

(Khodayari, study of factors inhibiting establishment of teleworking in Iranian public sector, 2012)

Each of measures had several factors which their weights, rankings and priorities are as follows:
Ranking 1 is belonged to fifth measure i.e. weakness of change management which rankings of its factors are as follows:

Table3. Rankings of factors of weakness of change management measure

factors	weight	ranking
Ignorance of reforming organizational processes in establishment of teleworking	0.586	1
Ignorance of training people for teleworking	0.317	2
Incompatibility of organizational culture with flexibility required for teleworking	0.0097	3

(Khodayari, study of factors inhibiting establishment of teleworking in Iranian public sector, 2012)

Ranking2 is belonged to first measure i.e. lack of environmental infrastructure which rankings of its factors are as follows:

Table4. Rankings of factors of lack of environmental infrastructure measurement

factors	weight	ranking
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Lack of favorable economic conditions for teleworking	0.216	1
lack of legal and technical infrastructure required for teleworking	0.201	2
Incompatibility of social and cultural infrastructure with teleworking system	0.175	3
Fear of social isolation	0.166	4
Lack of appropriate technology required for teleworkers	0.128	5
Lack of telecommunication infrastructure for implementation of teleworking	0.114	6

(Khodayari, study of factors inhibiting establishment of teleworking in Iranian public sector, 2012)

Ranking 3 is belonged to third measure i.e. inefficiency of operational system which rankings of its factors are as follows:

Table5. Rankings of factors of inefficiency of operational system measure

factors	weight	ranking
Lack of management trust in employees in order to assign teleworking tasks to them	0.365	1
Concerns of employees on lack of progress and promotion	0.243	2
Impossibility of doing some tasks in teleworking	0.155	3
Presence of temporary contracts with employees in organizations	0.100	4
Fear of decrease in job communications in teleworking	0,066	5
Problems related to monitoring teleworkers performance	0.042	6
Possibility of discrimination between teleworkers and other organizational employees	0.030	7

(Khodayari, study of factors inhibiting establishment of teleworking in Iranian public sector, 2012)

Ranking 4 is belonged to sixth measure i.e. unfavorable organization and orientation which rankings of its factors are as follows:

Table6. Rankings of factors of unfavorable organization and orientation measure

factors	weight	ranking
Tasks which their performance implies group work	0.449	1
Lack of experienced employees in organization for establishment of teleworking system	0.303	2
Concern of management on strategic information leakage	0.178	3
Reluctance of organization to outsource some activities	0.069	4

(Khodayari, study of factors inhibiting establishment of teleworking in Iranian public sector, 2012)

Ranking 5 is belonged to forth measure i.e. weakness of knowledge and specialty of teleworkers which rankings of its factors are as follows:

Table7. Rankings of factors of weakness of knowledge and specialty of teleworkers measure

factors	weight	ranking
High costs of teleworking system establishment	0.426	1
Inadequacy of technical knowledge of teleworkers for using and maintaining equipment without support	0.373	2
Lack of employees having knowledge and specialty for teleworking in organization	0.156	3
Lack of mative for learning English in employees	0.045	4

(Khodayari, study of factors inhibiting establishment of teleworking in Iranian public sector, 2012)

Ranking 6 is belonged to second measure i.e. lack of motivation and inclination of employees which rankings of its factors are as follows:

Table8. Rankings of factors of lack of motivation and inclination of employee's measures

factors	weight	ranking
Low motive of employees for working from home	0.423	1
Reluctance of men to implement teleworking system	0.238	2
Reluctance of women to implement teleworking system	0.173	3

Reluctance of married employees to implement teleworking system	0.116	4
Reluctance of single employees to implement teleworking system	0.050	5

(Khodayari, study of factors inhibiting establishment of teleworking in Iranian public sector, 2012)

Present research shows that measure of weakness of change management is the most important factor inhibiting establishment of teleworking system in Iranian public system and among its factors, ignorance of reforming organizational processes in establishment of teleworking had the most effect on implementation of teleworking system. Thus it is recommended that variables covered by this measure and appearing in 3 following inhibiting factors are addressed and adjusted:

- 1-1- Ignorance of reforming organizational processes in establishment of teleworking
- 1-2- Ignorance of training people for teleworking
- 1-3- Incompatibility of organizational culture with flexibility required for teleworking

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