

Designing a Model of Effective Development Factors of E-Government Services in Iranian Ministries

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Abstract

The purpose of this research is to design a model of effective development factors of e-government services in Iranian ministries. The present study tried to explore organizational and external factors in Iranian ministries (ministry of labor and social affairs, ministry of youth affairs and sports, ministry of foreign affairs, ministry of petroleum, ministry of Economic Affairs and Finance, ministry of energy, ministry of information and communications technology, ministry of interior, and ministry of education) influencing development of e-government services by a model. The model surveyed 287 individuals including managers and experts of e-government units (departments) in Iranian ministries through interviews and a questionnaire. Research variables and data were analyzed by SPSS, LISREL, and structural equations. Research results indicate that senior management and human resources largely influenced development of e-government services in organizational factors dimension; respecting to external environment factors, and information and communicative dimension, cultural and social contexts, as well as online security level and easy access to the websites of ministries largely influenced development of e-government services, respectively.

Keywords: E-government, development of e-services, information technology.

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Introduction

One of the most significant challenges that governments always face is to respond to the changing demands and expectations of the citizens legitimated by them. In response to these demands, the government must seek for new approaches brought continuous innovation in public service delivery for citizens (Aloudat et al, 2014). E-government initiates a new life stage of relationships between government and citizens, which is well reflected in public section management and administrative reforms. The present age is characterized with increasing growing of technologies interwoven with human lives. Man of the third millennium is trying to accelerate development and use of technology in various sections of social system away from the traditional pattern and to create the new model fitted to the requirements of the information age. In this regard, like most suppliers of goods and services, governments are rapidly oriented toward investment on innovative (modern) technologies of goods and service delivery to citizens as an approach to control the costs and to realize citizens' expectations (Elahi, Abdi, Danaeifard, 2010). Many governments are trying to modify (reform) governmental organizations by the advantage of information technology. E-government initiative is that it enables public sector agencies to deliver public services through information technology 24 hours seven days of week by the citizen request; it effectively contributes in citizens' empowerment. Anyway, public sector proper use of new technologies for service delivery may fundamentally change the relationship between government and citizens and reduce many difficulties citizens face in the traditional model such as long hierarchy, dispersion of government agencies, and time wasting (Saghafi, 2010).

However, analyzing electronic services in Iran reveals a small section of allocated services. The questions raise here include what are the effective development factors of e-government services? Are these factors externally rooted? In other word, to what extent technological, legal, cultural, and social infrastructures may influence development of e-services? To what extent, internal factors of the ministries such as senior managers, staffs, as well as structural issues, and the like may affect e-development? Therefore, the present research tries to study effective development factors of e-government services in Iranian ministries as these organizations are of the critical government pillars delivering the largest services to the citizens.

Research background

The concept of e-government is considered as part of motivation for new public management. E-government embraces wide scope of definitions from using information technology to freely transmit information in order to overcome physical barriers of traditional paper and physical systems, to apply technology to enhance accessibility to government services for the benefit of citizens, business partners, and employees. According to UN web page, e-government is referred to public institutions applying Information and Communication Technology (ICT) to deliver information and public services to people. Organization of economic cooperation and development (OECD) believes that e-government is the function of information and communication technology, in particular internet as a means of access to better government. Muthèn (1995), in a study, investigated effective factors of e-government addressed by organizations. According to

research results, an organization consists of 5 related components of management processes, structure, strategy, information, individuals, and roles. As the components are tightly interrelated, any change in one may require modification of other components. Therefore, accepting and moving toward e-government call for necessary changes proportionally in all five dimensions (Willoughby and Gomez, 2010).

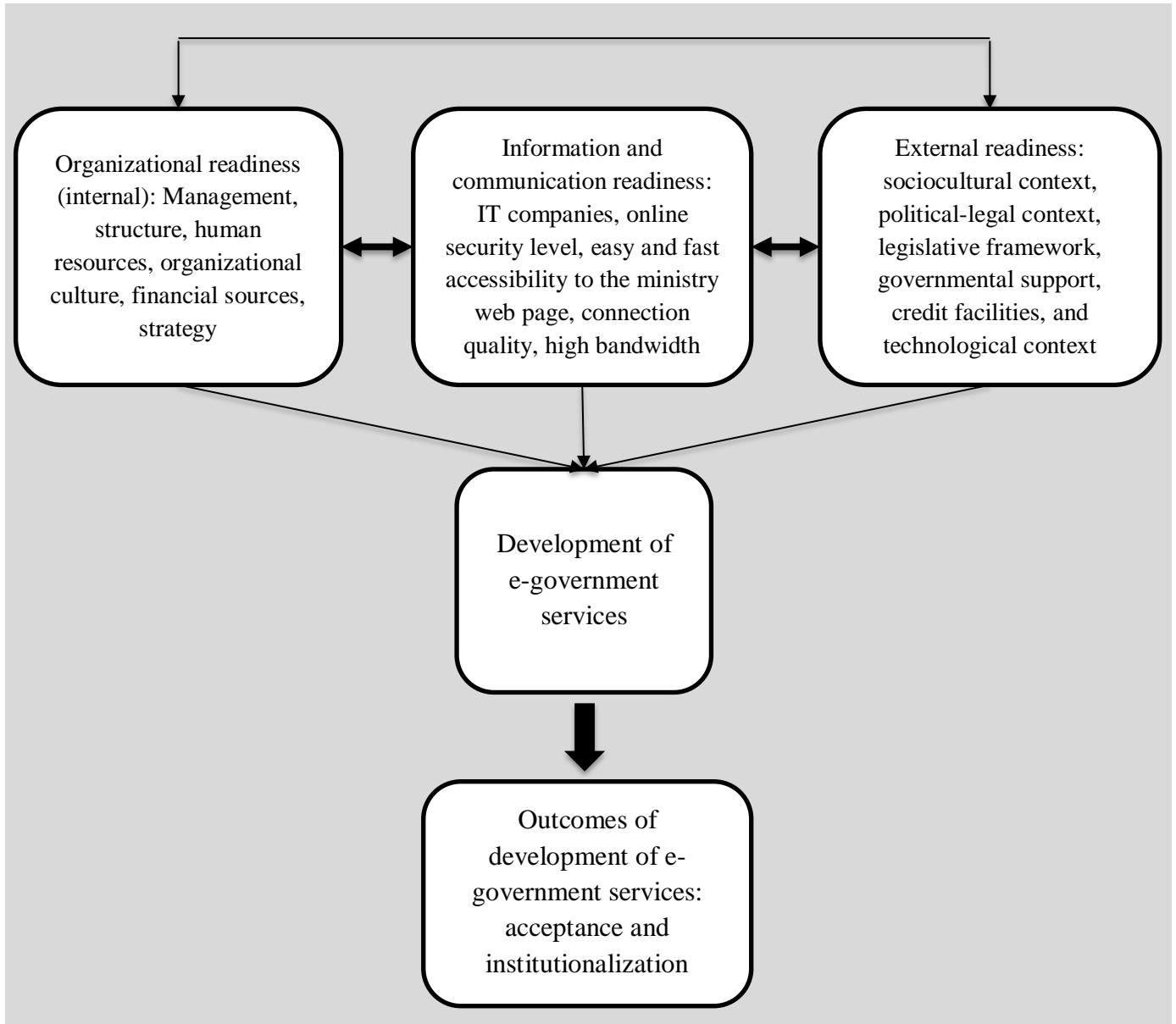
Mutalla and Brackel (2006) categorized e-government preparation assessment tools into four classes of organizational, human resources, information and communication technology, and external context. They assumed information as the critical constituent of economic development and, focusing on access to the information, introduced a new integrated means of e-government service development. Dihjan and Draw (2014) evaluated e-government readiness of public organizations in Vietnam. They provided a framework properly considers both organizational and environmental dimensions, and the opportunity of larger attention to information. Mulla, Hix, and Hinson (2013) analyzed the factors beyond organizational preparedness level in supporting e-government development. The study conducted in Ghana showed that social media, management capabilities, as well as government commitment significantly influence acceptance and function of tangible resources. Amini (2006) carried out a study to identify e-government barriers and challenges at Iranian banks. Research results show that organizational factors rated as the first obstacles followed by technological, managerial, and cost factors. Moreover, Bayati (2005) noted that effective development of e-government may require a framework to understand the electronic concept (Diwandari, Abedi, and Naserzade, 2013).

Infrastructures are of e-development requirements in Iran. Several studies were conducted in this area. In addition, different institutions and organizations proposed some models in recent years. Economist Intelligence Unit (EIU) is of the models exploring e-government development in governmental organizations, which measures 6 components of interior organizational readiness (management, structure, human resources, organizational culture, financial sources, and strategy) through 89 indicators. Literature review shows that some variables, of the mentioned studies, monitor outside; whereas, some others monitor inside factors in the organization. However, there are few studies simultaneously considering both. Reviewing the literature demonstrate that development of e-services is rooted in external and internal organizational factors (Southard and Sian, 2004).

Major conducted studies have been focused on e-commerce; and few studies investigated effective factors of development of e-government services. On the other hand, organizations unequally succeeded in service development. Lack of strategic approach is another problem exists in researches. In a better word, earlier studies individually considered external and internal factors in organization. The present research considers the strategic approach, which is a more comprehensive approach simultaneously exploring these factors and their interactions. Furthermore, research analysis is focused on development of e-services rather than e-commerce. Therefore, research recommendations will be more applicable for policy-makers and senior managements of Iranian ministries. In this regard, research model is illustrated in Figure 1. Research model investigates simultaneous effects of internal and external contexts in organizations;

furthermore, it also studies information and communicative readiness and indicates that external and internal contexts commonly influence development of e-government services in Iranian ministries; hence, internal and external context readiness is necessary for developing e-services in Iran. Moreover, the model also implies that internal and external forces mutually interact.

Figure 1: Research model



Research methodology

Since the present research tries to find out effective factors of development of e-government services and provide guidelines of reforming measures to the policy-makers, this is an applied study. On the other hand, this is a development-oriented research as knowledge increase attained through combining different models in one and studying variables' interactions. Considering this is a quantitative study, the quantitative strategies are of survey and correlation. In the research, 12 professors, managers, and experts of electronic associated departments were initially interviewed to deeper understanding of research issue. Then, a questionnaire was designed. Research statistical population included professional and managers of Iranian ministries (ministry of labor and social affairs, ministry of youth affairs and sports, ministry of foreign affairs, ministry of petroleum, ministry of Economic Affairs and Finance, ministry of energy, ministry of information and communications technology, ministry of interior, and ministry of education). Due to lack of information on the number of department managers, research sample were obtained through Cochran sampling method of infinite population at the significance level of 95% and estimated error of 0.05. Thus, sample volume was 207 individuals. 360 questionnaires were distributed among managers, experts, and ministries due to the probability of unreturned questionnaires; finally, 287 questionnaires were collected and analyzed.

Once the questionnaire investigated and compared to earlier studies, it was confirmed by understudied supervisors, advisors, as well as e-government experts to determine the questionnaire validity. In addition, exploratory factor analysis was used for validation factor, too.

Research reliability of 92.91% was estimated by distributing a questionnaire among 34 individuals and using Cronbach alpha coefficient through SPSS indicating the questionnaire high reliability. Finally, data were analyzed through path analysis and structural equations methods.

Research findings

Research structural model (path analysis)

This section analyses the relationship and causality between research variables. The results are separately represented by graphs as follows.

Research variables

- 1. Organizational readiness (internal):** senior management, strategy, organizational structure, human resources, organizational culture, and financial resources
- 2. Information and communicative readiness:** IT companies, online security level, easy and fast accessibility to the ministry web page, connection quality, high bandwidth

3. **External readiness:** sociocultural context, political-legal context, legislative framework, governmental support, credit facilities, and technological context
4. **Development of e-government services**
5. **Outcomes of development of e-government services:** acceptance and institutionalization

Path analysis

To find the answer to the question that which model may illustrate the relationship among external context readiness, information and communicative readiness, organizational readiness, and development of e-government services, three conceptual frameworks of the relationships between variables are presented through structural equations model. In the following, the frameworks are separately tested.

First model

It is necessary to determine the type of research variables prior to testing the hypotheses.

Independent variables: Organizational readiness (internal), information and communicative readiness, external context readiness

Mediator: development of e-government services

Dependent variable: outcomes of development of e-government services

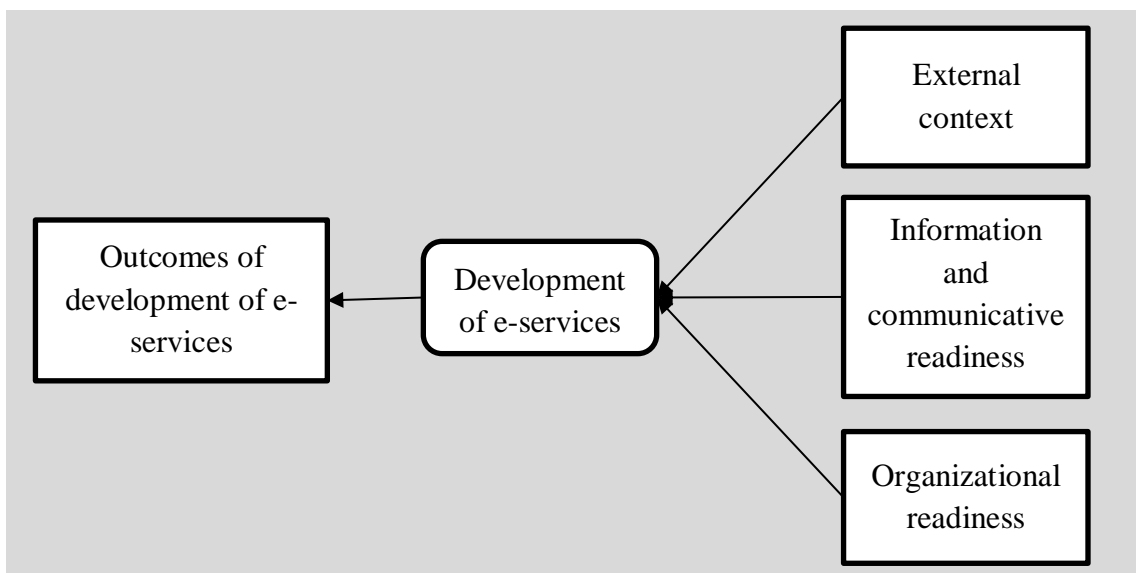


Figure 2: Conceptual framework of the first model

Hypotheses are as follows:

1. External factors have a direct, positive, and significant effect on the development of e-services.
2. Information and communicative factors have a direct, positive, and significant effect on the development of e-services.
3. Organizational factors have a direct, positive, and significant effect on the development of e-services.
4. Development of e-services have a direct, positive, and significant effect on development outcomes (the mediator role of development of e-services)

Respecting to fitness indicators, as seen in Figure 3, the model is proper as Chi square ratio to the degree of freedom is 2.01, which is smaller than 3; further, RMSEA is also smaller than 0.08.

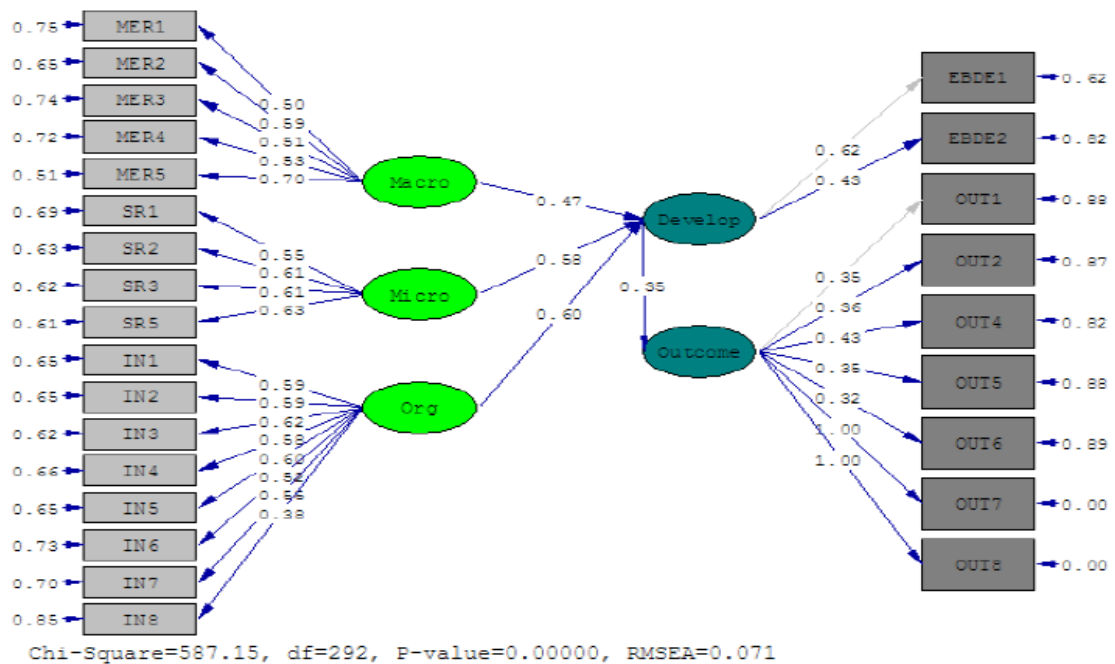


Figure 3: Model standard estimation

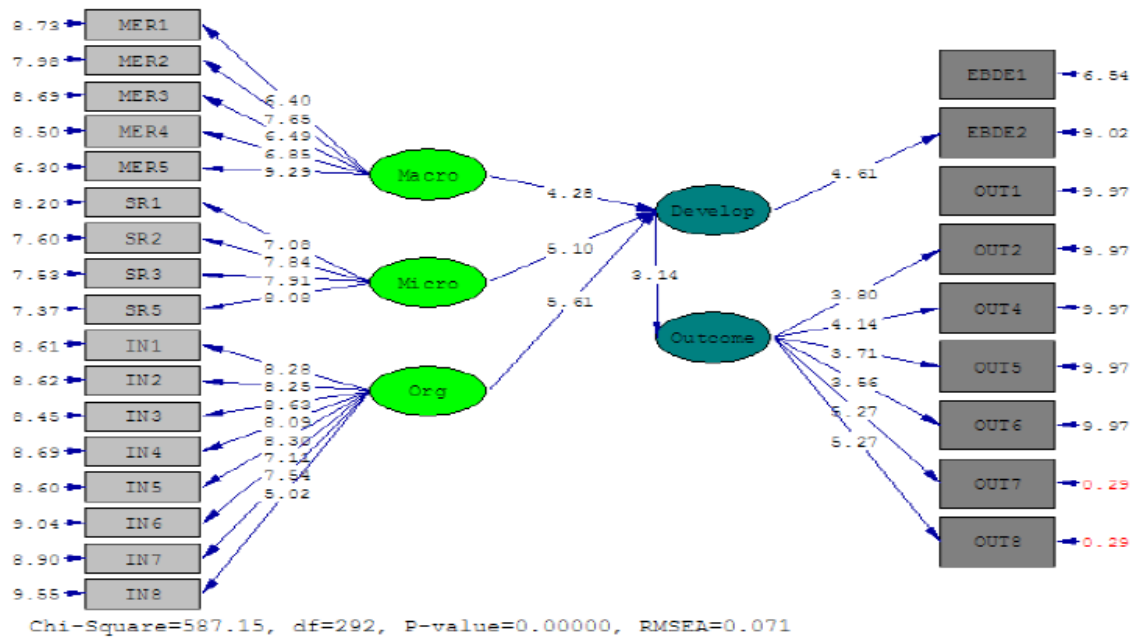


Figure 4: The significant model

According to Figure 4, all model parameters (excluding two errors on OUT7 and OUT8) are significant as their significance number is larger than 1.96. Therefore, according to number significance, it may be stated that all hypotheses are maintained. Total (overall) effects (direct and indirect effect) of external context factors, information and communicative factors, organizational factors, as well as development of e-government services on the outcomes (outcomes) of e-development are presented in Table 1.

Table 1: The effect of model variables on the outcomes of e-banking

Variable	Direct effect	Indirect effect	Total
External context factors	0.47	0.16	0.61
Information and communicative factors	0.58	0.2	0.78
Organizational factors	0.6	0.21	0.81
Development of e-services	0.35	-	0.35

As seen, the largest effects on the outcomes of development of e-banking are as follows: organizational factors, information and communicative factors, external context factors, and development of e-services.

Second model

Prior to testing the hypotheses, it is required to determine research variables considering research hypotheses.

Independent variables: external context, organizational factors (internal)

Mediator: information and communicative factors, development of e-services

Dependent variable: outcomes of development of e-services.

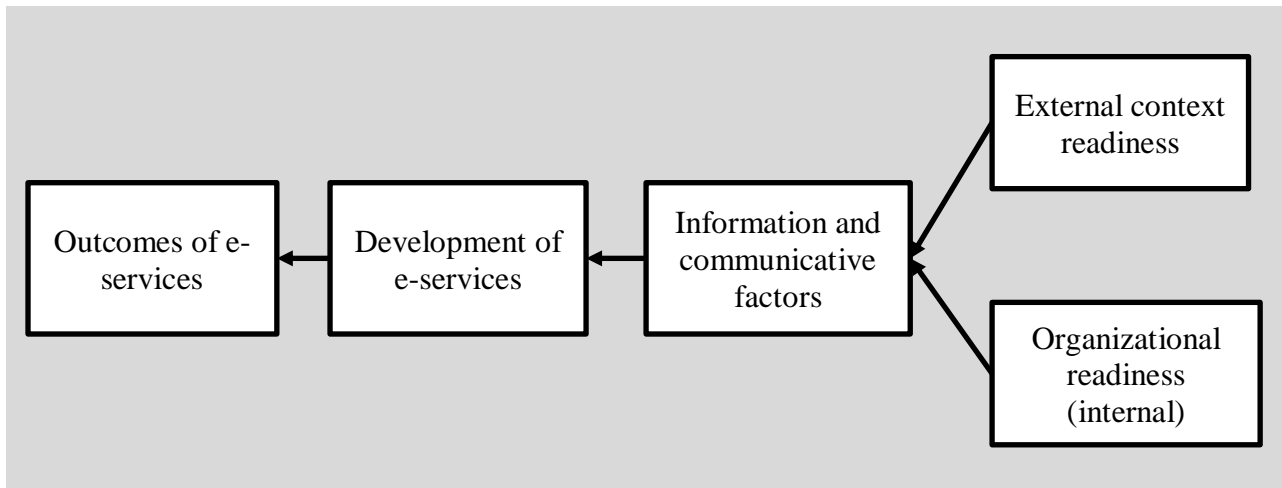


Figure 5: Conceptual framework of the second model

According to Figure 5, the hypotheses are as follows:

1. External context factors have a direct, positive, and significant effect on information and communicative factors.
2. Organizational factors have a direct, positive, and significant effect on information and communicative factors.
3. Information and communicative factors have a direct, positive, and significant effect on the development of e-services.
4. Development of e-services has a direct, positive, and significant effect on development outcomes.

As observed in Figure 6, the model is proper respecting to proportion indicators as Chi square ratio to degree of freedom is 2.17 (less than the allowed value of 3), and RMSEA is also smaller than 0.08.

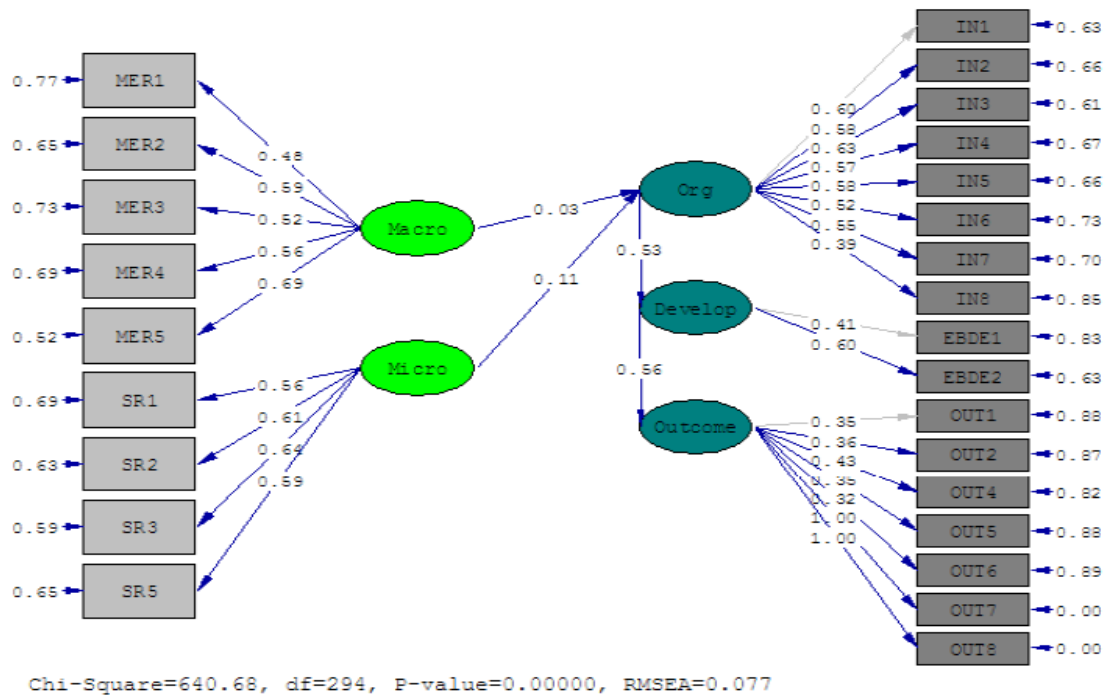


Figure 6: Model standard estimation

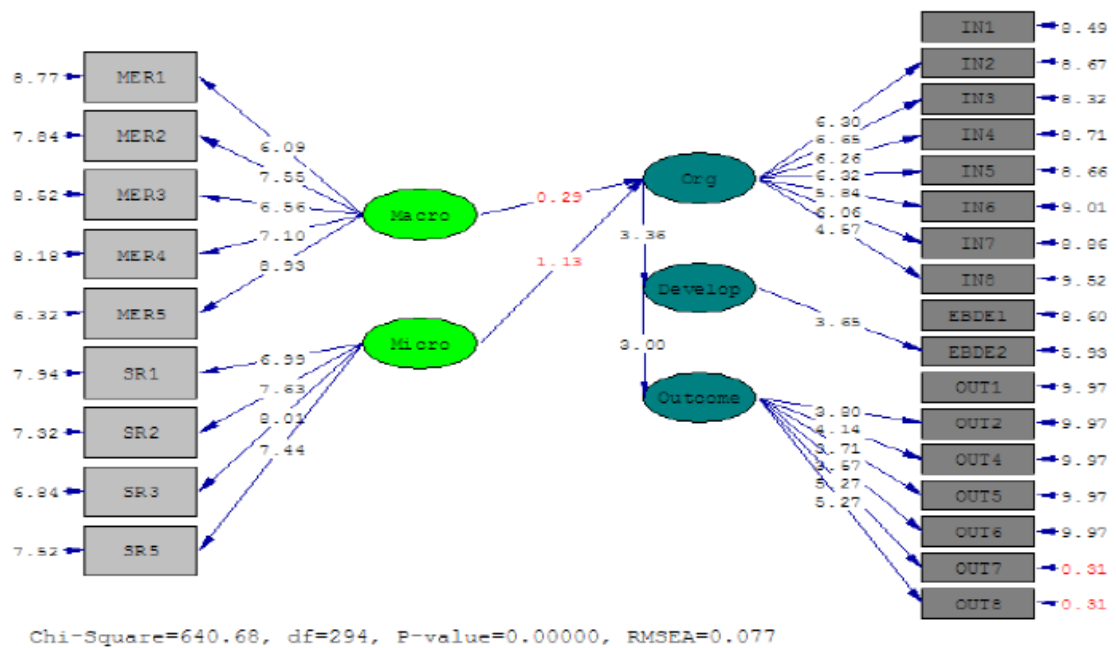


Figure 7: Significant model

As seen in Figure 7, all significance numbers of model parameters (excluding direct effect of external context factors and organizational factors on information and communicative factors, and also two errors on OUT8 and OUT7) are significant, as the

significance level is larger than 1.96. According to significant numbers; thus, it may be stated that the third and fourth hypotheses are maintained.

As the first and second hypotheses are rejected, it is concluded that the mediator effect of information and communicative factors is rejected i.e. information and communicative factors may not be considered as mediator. Thus, it is impossible to investigate indirect effects of external context factors and organizational factors through information and communicative factors. As a result, it may be stated that the variable of development of e-services also show no indirect effect on external context and organizational factors.

Third model

In Figure 8, the mediating role of external context factors and organizational factors (internal) is investigated. In other word, it is assumed that external context factors and organizational factors may serve as the mediator of the relationship between information and communicative factors and development of e-services. Hence, the following conceptual model is studied.

Prior to testing the hypotheses, research variables are determined regarding research hypotheses.

Independent variable: information and communicative factors

Mediators: external context factors and organizational factors

Dependent variables: development of e-services and development outcomes

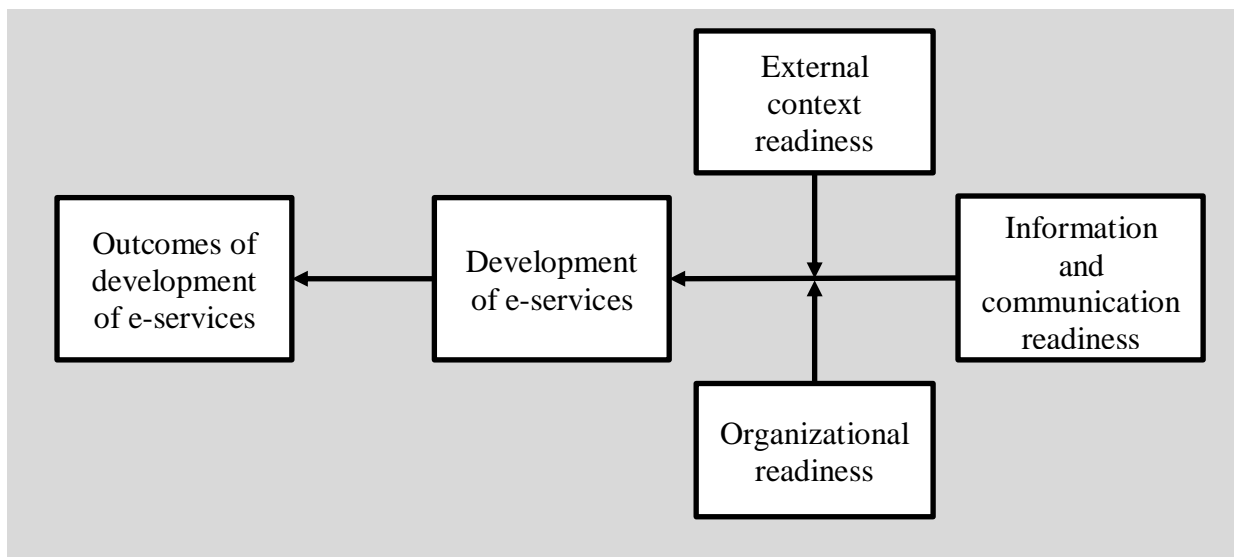


Figure 8: Conceptual framework of the third model

According to Figure 8, the hypotheses are as follows:

1. External context factors mediate the relationship between information and communicative factors and development of e-services.
2. Organizational factors mediate the relationship between information and communicative factors and development of e-services.
3. Information and communicative factors have a direct, positive, and significant effect on the development of e-services.
4. Development of e-services has a direct, positive, and significant effect on development outcomes.

The mediating effect of external context and organizational factors was tested using the statistical method of subgroup analysis.

Mediating role of external context factors

- a. Studying the regression model where external context factors are undesired (141 cases)

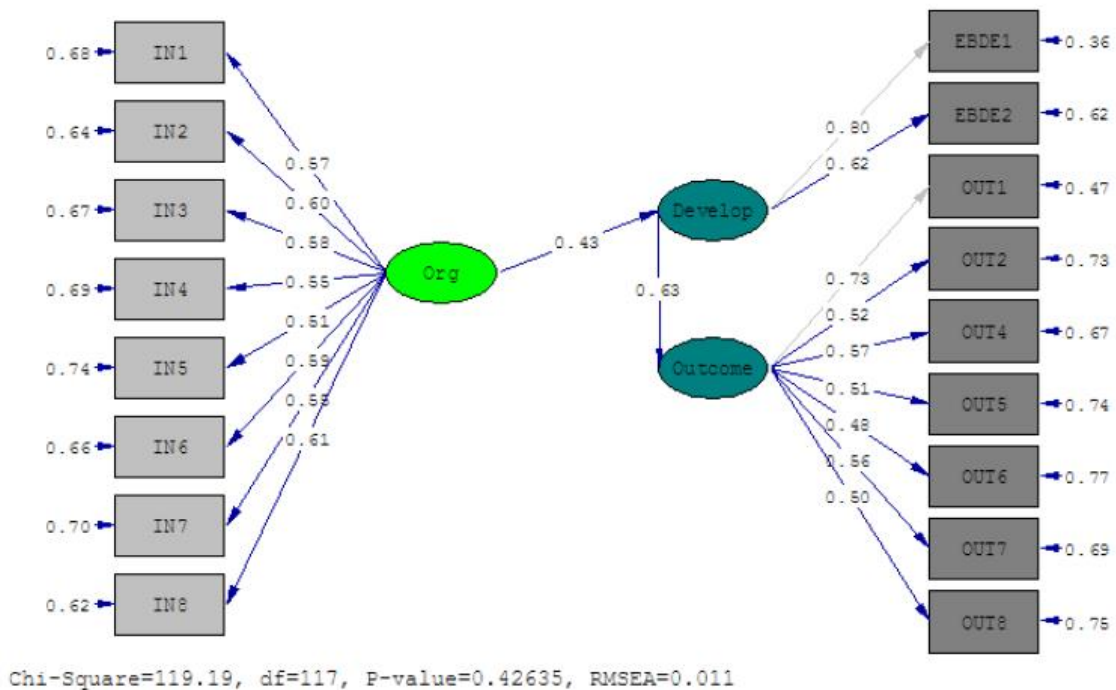


Figure 9: Standard model

- b. Studying the regression model where external context factors are desired (146 cases)

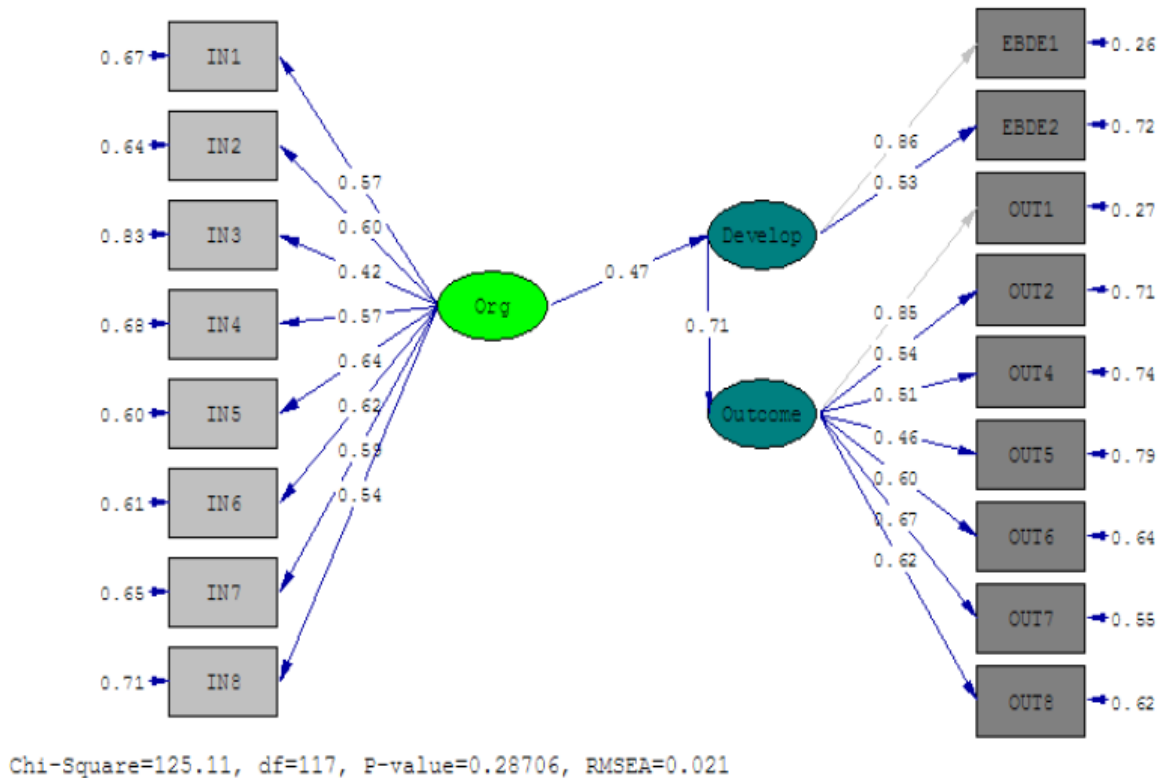


Figure 10: Standard model

Once the regression model is examined in desired and undesired conditions of external context factors, it is required to compare its effects on variables. The results are provided in Table 2. According to the negligible difference between the two models, it is inferred that external factors have no mediating role in the relationship between information and communicative readiness and e-development. In other word, because of the models' coefficients proximity, it is not necessary to measure Z_r and Z_0 . Hence, it is deduced that external context factors have no mediating role in the relationship between information and communicative factors and e-development.

Table 2: Comparison of the two models

Interaction of the variables	Undesired external context factors model	Desired external context factors model	Model difference value
Information and communicative factors in banking development	0.43 significant	0.47 significant	0.04 negligible
Banking development on development outcomes	0.63 significant	0.71 significant	0.08 negligible

Mediating role of organizational factors (internal)

a. Studying regression model at undesired organizational factors (146 cases)

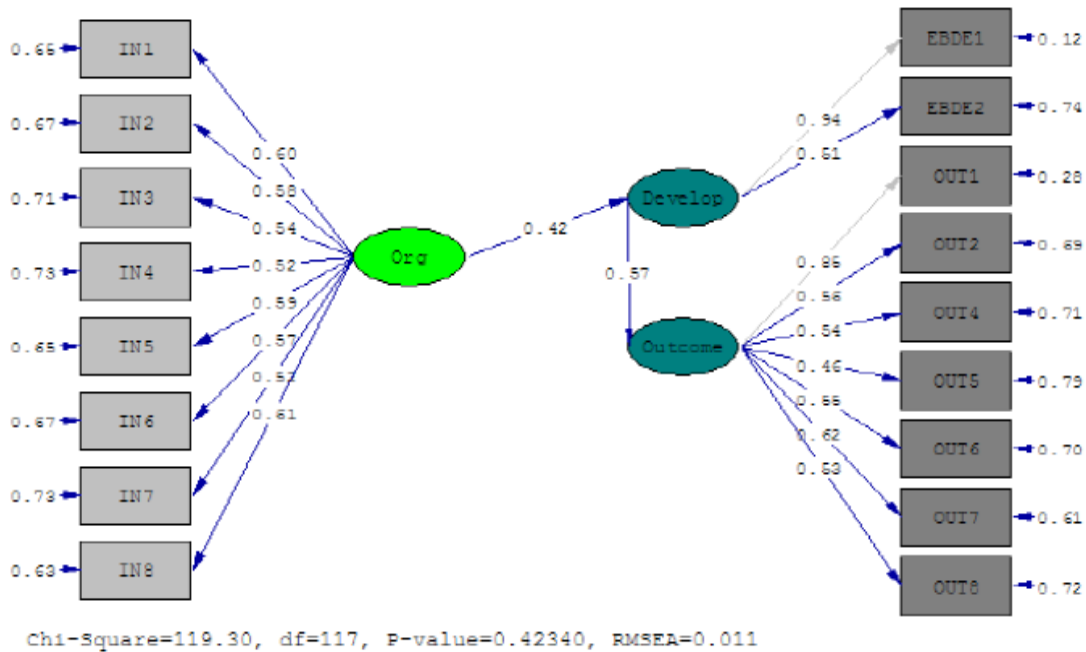


Figure 11: Standard model

b. Studying regression model at desired organizational factors (141 cases)

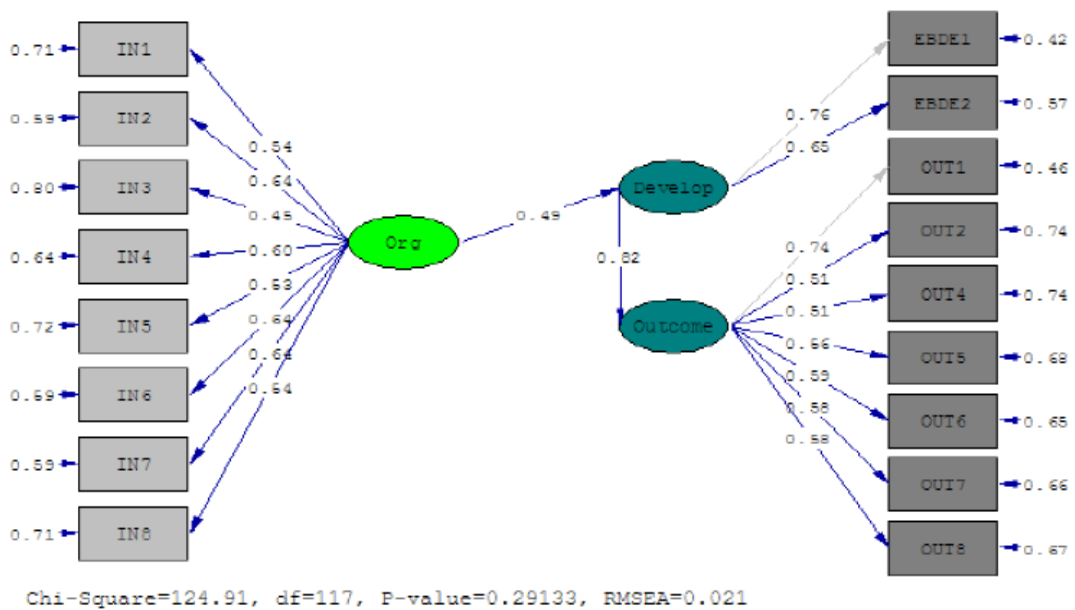


Figure 12: Standard model

Table 3 represents coefficients of the two models. As the proximity of models' coefficients in the first section of the model i.e. the effect of organizational factors on banking development, it is not necessary to calculate Z_r and Z_0 . Thus, it is concluded that organizational factors show no mediating role in the relationship between information and communicative factors and e-development; whereas, in the second section, i.e. the effect of e-services on development outcomes, the mediating role of organizational factors is possible.

Table 3: Comparison of the two models

Interaction of the variables	Undesired organizational factors model	Desired organizational factors model	Model difference
Organizational factors on development	0.42 significant	0.49 significant	0.07 negligible
e-development on development outcomes	0.57 significant	0.82 significant	0.3 large

Conclusion

This research is conducted to present a development model of e-services. In this regard, the relationship between research variables and causality of model variables was examined. Using structural equations model, three conceptual frameworks obtained from the relationships between variables. Research results are as follows:

1. According to the first model, the effective factors of e-development outcomes are ranked as organizational factors as the first, followed by external context, information and communicative factors, and e-development.
2. According to the second mode, external context and organizational factors showed no effect on information and communicative readiness; therefore, it may not be regarded as mediator.
3. According to the third model, organizational factors and external context showed no mediating role in the relationship between information and communicative readiness and e-development.

It is also concluded that

1. External context factors, organizational factors, and information and communicative factors have a direct, positive, and significant effect on the development of e-banking.
2. Organizational factors show more direct effect on e-development than external context and information and communicative factors.
3. External factors' dimensions are at undesired condition (less than mean).

4. Activities of e-development are mostly rooted in internal factors rather than external factors, in particular in support and knowledge of senior managements of governmental organizations and ministries.

In general, research results imply that respecting to organizational factors, senior management and human resources largely influence e-development; in term of external factors, sociocultural context, and in term of information and communicative factors, online security level and easy, rapid access have the largest effect, respectively. According to research model, organizational factors, information and communicative readiness, as well as external context readiness altogether influence e-development by the correlation coefficient of 0.6, 0.58, and 0.47.

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