The Pathology of the ICT Deployment: Case Study of Telecommunication Company of Ilam Province, Iran

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Abstract
The purpose of this study was the pathology of the application of information and communication technologies in the telecommunication company of Ilam. For this purpose, quantitative approach and survey method were used. Three groups of stakeholders, including employees, managers and clients were organized. The total number of samples included 200 employees, 35 managers and 30 clients. Employees were selected by random sampling, clients by available sampling, and managers by census method. Data were collected through questionnaires consisting of seven dimensions based on Ward and Elvin model. Content validity of the questionnaire was used to validate the questionnaire. On the other hand, Cronbach's alpha was applied for reliability of the questionnaire which was appropriate (0.92). In addition, one-sample t-test and Friedman test were used to analyze the data. The findings showed that the barriers to organizational processes, organizational outcomes, and internal context of the organization and past experiences are the barriers to the deployment of ICT in the telecommunication company of Ilam. Additionally, the findings showed that factors related to the intent, organizational content and external context of the organization were under the favorable conditions.

Key words: ICT, barriers to ICT, ICT pathology.

Introduction and Problem Statement
Life in the modern world requires the knowledge and skills of ICT and its application in life. If someone doesn’t possess such abilities and skills, he/she will lose countless opportunities. Consequently, organizations are affected by this issue and they should equip themselves by new ideas in the field of information and communication (Bahari, Ansari, Sohrabi, 2010). In fact, the external environment of organizations is highly variable and changing and knowledge is known as a value added; So that the current era is called the Information Age and half of the overall human information is outdated every 5 years and it is replaced by knowledge and new information (Jalilvand, 2009). These rapid changes as well as increasing information lead to the development of ICT and new technologies. In fact, development of information and constant change in the external environment, the ruling of ICT is one of the undeniable issues in the organizational environments (Bahari, Ansari, Sohrabi, 2010). If one of the strategic challenges of organizations is to become a learning and knowledge-based organization in the modern living space, ICT deployment will be one of the requirements for attaining this goal because this technology can remove daily spatial and temporal constraints of organizations and facilitate information processing and sharing (Deft, 2010; Bergeron, 2003).

Deployment of ICT as a strategic plan has been designed and developed in many organizations. The telecommunication company of Ilam is one of the organizations which has felt the need for deployment of information and communication technology. hence, it has taken effective steps for the deployment of ICT. The nature and mission of the organization are the development of virtual communication ranging from phone calls to Internet connections and Viber. Thus, the development of ICT is an integral part of the company. The fundamental point is that only determination of plans and developmental or evolutionary decisions cannot lead to the successful plan. In the other words, formulation of the appropriate strategy is effective when it can be implemented (Al _Ghamdi, 1998; Hrebinia, 2006). But the evidence shows that, on the one hand, relevant literature and, on the other hand, practical activities and efforts in organizations focus on formulation of strategies rather than its implementation; hence, implementation of the strategy and its aspects has been neglected (Al _Ghamdi, 1998; Hrebinia, 2006; Heide, Gronhaung & Johannessen, 2002). According to this fact, the main reason for the inefficiency of strategic plans is more related to implementation rather than its formulation (Hrebinia, 2006; Al _Ghamdi, 1998). A research conducted by
management consultants showed that less than 10% of effectively formulated strategies are implemented successfully (quoted by Kaplan & Norton, 2007). Many management experts have estimated that about 50 to 90 percent of strategies are failed in their implementation and the reason is more related to the implementation rather than formulation (Candido & Santos, 2008). On the other hand, the implementation of strategic management requires more time, however, it is more difficult, more complex and generally more challenging than formulation of strategy (Kaplan & Norton, 2007; Hrebiniak, 2006; Al-Ghamdi, 1998). Nevertheless, this study tries to identify the barriers to the deployment of ICT in the telecommunication company of Ilam.

**Conceptual Model of Research**

In order to achieve the goal of research, the theoretical model of Ward and Elvin (1999, quoted by Alidosti, 2008). This model determines factors affecting the success of ICT. The inefficient and ineffective factors or their absence can have adverse effects. Thus, the dimensions of this model are used to identify and determine the barriers. The model has seven basic dimensions as follows:

1. **Intent:** what causes the changes to be made.
2. **Process:** actions and reactions of the stakeholders during the changes.
3. **Content:** specific areas in which changes take place.
4. **Outcome:** the results of the change.
5. **Internal context:** structure, culture and political context.
6. **External context:** social, economic, cultural and political environment which surrounds the organization.
7. **History:** former experiences of organization.

![Ward and Alvin Model (1999, quoted by Alidosti, 2008)]

**Research Questions**

- To what extent is the intent of ICT deployment clear in the telecommunication company of Ilam?
- To what extent have the organizational processes optimally functioned for ICT deployment in the telecommunication company of Ilam?
- To what extent have the content of activities and organizational arrangements optimally functioned for ICT deployment in the telecommunication company of Ilam?
- To what extent have the outcomes of the telecommunication company of Ilam effectively functioned for ICT deployment?
- To what extent has the internal context of organization effectively functioned for ICT deployment in the telecommunication company of Ilam?
- To what extent have the past experiences effectively functioned for ICT deployment in the telecommunication company of Ilam?
To what extent has the external context of organization effectively functioned for ICT deployment in the telecommunication company of Ilam?

**Literature Review of Research**

Farhangi et al. (2010) conducted a research on reviewing barriers to deployment of ICT in Iran’s state companies of the mining industry. According to the findings, elements of social barriers, infrastructure, and legal and digital gap are considered as the highest barrier and barriers to information security and change management as the lowest barrier for the efficient deployment of ICT to improve the accountability system for Iran’s state companies of the mining industry. Nasiri Alabadi and Porzahir (2009) conducted a research on the barriers of ICT deployment in education. For the purpose of the study, the researchers proposed a model including 16 variables and the results confirmed the model.

Shahbaz, Nasr Esfahani and Zamani (2002) conducted a research on reviewing barriers to deployment of ICT in high schools of Esfahan city. Their findings showed that the most important barriers include:

1. Teachers' lack of proficiency in English
2. Weaknesses in computer knowledge
3. Failure to integrate computers into the curriculum content
4. Lack of time to work practically rather than theoretically in high school

Mirhosseini and Safari (2011) conducted a research on reviewing barriers to deployment of ICT in academic libraries of Gorgan city. Their findings suggested that the main barriers from the perspective of the librarians include:

1. Lack of adequate training
2. Failure to identify and provide resources
3. Librarians' lack of proficiency in English

Alidosti (2008) conducted a research on reviewing barriers to deployment of ICT from the perspective of change management. In this study, he divides the barriers to change into two categories including process and content barriers. He uses Ward and Elvin model to assess barriers to the content and kotter’s model for assessing barriers to the process. Davarpanah (2003) conducted a research entitled “Infrastructure barriers to the use of information technology in academic libraries of Iran” and argued that academic libraries of Iran face several infrastructure barriers to successful use of information technology. These factors include in order of preference: state, economic, social, cultural, employee, technical, and managerial. He believes that short-term and long-term solutions must be considered to overcome the problem. The minimum responsibilities of the government in the field of information include formulation of national information policy, legislation of effective law for information system, and the establishment of National Information Organization. Furthermore, he believes that design and development of internal databases for the automation program of Iran academic libraries are high priorities. Hence, meeting internal information needs of Iran's research and scientific community provides the context of information market through international networks of information. Raza Nad (2007) reviewed the use of ICT in Indian Universities. The findings showed that although quality of service delivery depends on the use of ICT, Indian academic universities still use more printed resources than electronic ones with regard to the integration of printed resources with electronic and digital ones. Mehdian and Shahbazi (2012) reviewed the barriers and challenges of using new technologies from the perspective of university professors. Their findings suggested that the main barriers include:

1. Researchers' unfamiliarity with ICT skills in their research works
2. Lack of ability in the English language
3. Lack of full access to the electronic resources

Abdullah, Dewitt and Elias (2013) reviewed the challenges of improving school through the lens of ICT. Their findings shows that the importance of quality, the views and beliefs of the school leader in the use of information communication can help school use ICT more excellently. McMahon and Alex Ball (2013) reviewed challenges of information systems and finally reached the conclusion that social - technical challenges and issues related to quality and care are the most important challenges.

**Methodology**

This research is practical in terms of purpose and descriptive survey in terms of method. The population includes three categories of people who deal with the ICT deployment in the telecommunication company of Ilam. The first category includes all employees in the telecommunication company of Ilam who have a direct relationship with information technology; the second category includes managers in the telecommunication company of Ilam who play the role of facilitating and supporting ICT; finally, the third category includes...
clients and customers in the mentioned telecommunication company who have the necessary knowledge about the performance of ICT in the company. Three different samples were used for each of these three groups. Cluster sampling was used for sampling of employee population because it is numerous and scattered in branches across the province. The total number of employees and personnel in the telecommunication company of Ilam was 400. Employees were estimated 200 people by Cochran's sample size formula. Census method was used for sampling of managers. The total number of managers was limited and included 53 people; thus, all of them were requested to participate in the study. Available sampling was used for sampling of clients and customers and the sample size was 30 people. Data were collected through questionnaires consisting of seven dimensions based on Ward and Elvin model. Questionnaire items were drawn from the empirical literature. First, 23 questions were designed. Content validity was used to validate the data. The score of CVI was 0.85 and higher than 0.79; therefore, it was considered appropriate. Cronbach’s alpha was used to assess the reliability. Cronbach’s alpha coefficient was 0.92. Therefore, questions had acceptable reliability. One-sample t-test was used to analyze the data.

**Findings**

- **1st question:** To what extent is the intent of ICT deployment clear in the telecommunication company of Ilam?

  As displayed in Table 1, the obtained mean value is 13.72 and higher than the assumed mean value which is 12. According to the T value, there is a significant difference between the obtained mean value and the assumed mean value (p < 0.05). In other words, the participants (managers, employees, clients) believe that the intent of ICT deployment is clear in the telecommunication company of Ilam.

- **2nd question:** To what extent have the organizational processes optimally functioned for ICT deployment in the telecommunication company of Ilam?

  As displayed in Table 2, the obtained mean value is 10.61 and lower than the assumed mean value which is 12. According to the T value, there is not a significant difference between the obtained mean value and the assumed mean value (p < 0.05). In other words, the participants (managers, employees, clients) believe that the organizational processes do not optimally function for ICT deployment in the telecommunication company of Ilam.

- **3rd question:** To what extent have the content of activities and organizational arrangements optimally functioned for ICT deployment in the telecommunication company of Ilam?

  As displayed in Table 3, the obtained mean value is 8.25 and higher than the assumed mean value which is 8. According to the T value, there is a significant difference between the obtained mean value and the assumed mean value (p < 0.05). In other words, the participants (managers, employees, clients) believe that the content of activities and organizational arrangements optimally function for ICT deployment in the telecommunication company of Ilam.
• 4th question: To what extent have the outcomes of the telecommunication company of Ilam effectively functioned for ICT deployment?

Table 4: t-test results for the component of outcome

<table>
<thead>
<tr>
<th>Component</th>
<th>Number</th>
<th>Mean</th>
<th>Standard deviation</th>
<th>Standard error</th>
<th>T</th>
<th>df</th>
<th>Sig.</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Outcome</td>
<td>293</td>
<td>14.04</td>
<td>0.382</td>
<td>0.022</td>
<td>327.08</td>
<td>292</td>
<td>0.000</td>
<td>H₀ rejected</td>
</tr>
</tbody>
</table>

As displayed in Table 4, the obtained mean value is 14.04 and higher than the assumed mean value which is 12. According to the T value, there is a significant difference between the obtained mean value and the assumed mean value (p<0.05). In other words, the participants (managers, employees, clients) believe that the outcomes of the telecommunication company of Ilam effectively function for ICT deployment.

• 5th question: To what extent has the internal context of organization effectively functioned for ICT deployment in the telecommunication company of Ilam?

Table 5: t-test results for the component of internal context of organization

<table>
<thead>
<tr>
<th>Component</th>
<th>Number</th>
<th>Mean</th>
<th>Standard deviation</th>
<th>Standard error</th>
<th>T</th>
<th>df</th>
<th>Sig.</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Internal context of organization</td>
<td>293</td>
<td>9.90</td>
<td>1.25</td>
<td>0.073</td>
<td>-185.09</td>
<td>292</td>
<td>0.071</td>
<td>H₀ accepted</td>
</tr>
</tbody>
</table>

As displayed in Table 5, the obtained mean value is 9.90 and lower than the assumed mean value which is 16. According to the T value, there is not a significant difference between the obtained mean value and the assumed mean value (p<0.05). In other words, the participants (managers, employees, clients) believe that the internal context of organization does not effectively function for ICT deployment in the telecommunication company of Ilam.

• 6th question: To what extent has the external context of organization effectively functioned for ICT deployment in the telecommunication company of Ilam?

Table 6: t-test results for the component of external context of organization

<table>
<thead>
<tr>
<th>Component</th>
<th>Number</th>
<th>Mean</th>
<th>Standard deviation</th>
<th>Standard error</th>
<th>T</th>
<th>df</th>
<th>Sig.</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>External context of organization</td>
<td>293</td>
<td>14.50</td>
<td>1.027</td>
<td>0.060</td>
<td>-206.02</td>
<td>292</td>
<td>0.057</td>
<td>H₀ accepted</td>
</tr>
</tbody>
</table>

As displayed in Table 6, the obtained mean value is 14.50 and lower than the assumed mean value which is 16. According to the T value, there is not a significant difference between the obtained mean value and the assumed mean value (p<0.05). In other words, the participants (managers, employees, clients) believe that the external context of organization does not effectively function for ICT deployment in the telecommunication company of Ilam.

• 7th question: To what extent have the past experiences effectively functioned for ICT deployment in the telecommunication company of Ilam?

Table 7: t-test results for the component of past experiences

<table>
<thead>
<tr>
<th>Component</th>
<th>Number</th>
<th>Mean</th>
<th>Standard deviation</th>
<th>Standard error</th>
<th>T</th>
<th>df</th>
<th>Sig.</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Past experiences</td>
<td>293</td>
<td>6.91</td>
<td>1.12</td>
<td>0.066</td>
<td>-146.68</td>
<td>292</td>
<td>0.062</td>
<td>H₀ accepted</td>
</tr>
</tbody>
</table>

As displayed in Table 7, the obtained mean value is 6.91 and lower than the assumed mean value which is 12. According to the T value, there is not a significant difference between the obtained mean value and the assumed mean value (p<0.05). In other words, the participants (managers, employees, clients) believe that
the past experiences do not effectively function for ICT deployment in the telecommunication company of Ilam.

Discussion and Conclusion
The findings showed that the participants (managers, employees, clients) believe the philosophy and why the use of hardware and software programs for the employees the organization have been identified and the reason for the use of internet and technological systems is completely clear; furthermore, the employees know that why they should use new systems and technologies. This part of findings is consistent with the results of studies conducted by Shahbaz, Nasr Esfahani, and Zamani (2002), Mirhosseini and Safar (2011), Alidosti (2008), Raza Nad (2007), Davarpanah (2003), Farhangi, Hosseinzadeh, and Salehi (2010), McMahon and Alex Ball (2013), and Abdullah, Dewitt and Elias (2013). None of these researches consider lack of clear purpose for the use of ICT as a barrier for implementation. According to the findings, the participants (managers, employees, clients) believe that the organizational processes do not optimally function for ICT deployment in the telecommunication company of Ilam. This means that management of the organization has not made effective efforts to develop ICT more excellently. Furthermore, the planning and personnel and administrative organization are not coordinated and consistent with the use of software and hardware technology and the Internet. It is worth mentioning that only Alidosti (2009) among all the researchers in the past reviewed the barriers of process and other researchers have not identified the barriers of process. The findings also suggested that the participants (managers, employees, clients) believe that the content of activities and organizational arrangements optimally function for ICT deployment in the telecommunication company of Ilam. Hence, $H_0$ (null hypothesis) is rejected and $H_1$ (alternative hypothesis) is accepted. This part of findings is consistent with the results of studies conducted by Shahbaz, Nasr Esfahani, and Zamani (2002), Mirhosseini and Safar (2011), Alidosti (2008), Raza Nad (2007), Davarpanah (2003), Farhangi, Hosseinzadeh, and Salehi (2010), McMahon and Alex Ball (2013), and Abdullah, Dewitt and Elias (2013). In addition, the participants (managers, employees, clients) believed that the outcomes of the telecommunication company of Ilam effectively function for ICT deployment. This part of findings is consistent with the results of studies conducted by Shahbaz, Nasr Esfahani, and Zamani (2002), Mirhosseini and Safar (2011), Alidosti (2008), Raza Nad (2007), Davarpanah (2003), Farhangi, Hosseinzadeh, and Salehi (2010), McMahon and Alex Ball (2013), and Abdullah, Dewitt and Elias (2013). With regard to the fifth question, the participants (managers, employees, clients) believed that the internal context of organization does not effectively function for ICT deployment in the telecommunication company of Ilam. This part of findings is consistent with the results of studies conducted by Farhangi, Hosseinzadeh, and Salehi (2010), Alidosti (2008), Davarpanah (2003), McMahon and Alex Ball (2013). With regard to the external context of the organization, the participants (managers, employees, clients) believed that it does not effectively function for ICT deployment in the telecommunication company of Ilam. This part of findings is consistent with the results of studies conducted by Farhangi, Hosseinzadeh, and Salehi (2010), Alidosti (2008), Davarpanah (2003), McMahon and Alex Ball (2013).

The obtained findings related to the component of past experiences showed that it does not function effectively. It should be mentioned that past researches didn’t address this factor.

References