Study the Effects of Empowerment Policies on Successful Acceptance of Information Technology (IT) with Emphasis on Iranian Pharmaceutical Industry

Alireza Fazlzadeh, Behzad Salmani, Raheleh Kari

Abstract—Today, organizations make high amount of investments on information technology to increase access to information. Computer has become one of the important tools in personal and organizational scopes and different organizations use it for various goals. This research tries to study the effect of an important factor; that is, the empowerment policies via perceived usefulness and the perceived ease of use in successful acceptance of information technology in the pharmaceutical industry units of Iran. The researcher-developed questionnaire was used to collect data and the reliability of it was approved by concerned professors and its validity was calculated in 92.4% certainty. Four senior managers of each production units, including managing director, manager of human resources, IT manager and Research and Development Manager were the addressees of the questionnaires. 400 questionnaires were distributed, 328 of which became the basis of the statistical analysis of the research. The research data was analyzed by using path analysis technique and using LISREL Software. The results show that the empowerment policies that are studied have positive and significant effects on the successful acceptance of this technology in pharmaceutics production units via the factor of perceived usefulness from information technology.

Index Terms—Information Technology, Acceptance Model, Empowerment Policies, Perceived Ease of Use, Perceived Usefulness.

1 INTRODUCTION

RESEARCHES show that using information technology in organizational activities is one of the most important reasons of distinctions of organizations; that is, organizations that used information technology extensively and in optimized way have sustained competitiveness advantage and have higher distinctions than other organizations in terms of beneficiaries [1]. Attention to information technology is necessary for achieving the goals of the organization and the importance of this subject lies in its power to reduce the role of human resources and systematization of man and machine relations. On the other hand, organizations' staffs, like information, are highly important resources and paying attention to them is a necessity and inevitable approach for achieving the goals too. By having access to proper and sufficient information, employees will be able to perform their duties and the IT; too, is a suitable tool for developing, processing and maintaining information. Attention to this subject is a necessity and important matter in the Iranian organizations and no one can underestimate its importance [2]. Success in using IT depends both on the characteristics of the technology and the skills; and specialization of the individuals who use it. In another word, the behavior related to the technology use is both controlled by factors beyond the environment; and affects personal characteristics such as attitude, understanding The external factors; too, could include any factors such as organizational, social and computer systems specifications factors [3]. The level of information technology has a very close relationship with its acceptance. Although the current computer programs have become easier for the users, many individuals still have problems in adopting the information technology. Adopting information technology is critical for organizations that plan to use the mentioned benefits by using them. Resistance against information technology is a potential risk factor in the destruction of investments of organizations in this area [4]. Failure in adopting information technology by its users leads to the destruction of relevant investments and in addition, it is associated with loss of time. Since the life of today organizations is not possible without considering information technology applications; these organizations always seek practical and executive approaches for optimized use of information technology by their users. Identification of factors that are effective in acceptance of information technology is in direct relationship with the maturity growth of the organization and employees, and the place of the relevant industry. The factors that affect on adopting a technology differ in various organizations and industries. There might be a set of factors discussed in an industry as a main demand for accepting information technology while the same factors in another industry have not many effects in information technology acceptance. In the area of applying this technology in the Iranian organizations, the most important subject is the non application of this technology properly and in optimized way. Therefore; identifying the effective factors on adopting the information technology by the employees of the organization is a critical issue in this area. With respect to the fact that establishing an oriented and directive sense in employees and pushing them towards anticipated behaviors in organizations are affected by the executive
policies such as empowerment policies in the organization. One can predict that those factors could be used as suitable solutions for successful acceptance of information technology. In the continuation of the discussion, by attributing to the scientific and technical studies and researches, and attention to the point that the most important effective factors on the performance of employees in an organization are the strategies and empowerment policies in that organization; and, the end users of information technology are organizations’ human resources; we decided to perform the concerned researches in the state pharmaceutical industry. This measure has been taken for the reasons of micro processing and existing sensitivity in information technology in pharmaceutical production units of Iran and the need of this industry to have a suitable ground on adopting the information technology.

2 LITERATURE REVIEW

2.1 Acceptance of Information Technology

Davis et al [5] presented the technology acceptance model based on the justified action theory and found out that this model is better able to describe the information technology acceptance by the user. The information technology acceptance model is shown in figure 1. The technology acceptance model has been used in different researches for acceptance of various types of technology; such as electronic mail, word processor, websites, programming systems for company resources and e-commerce [6]. Based on the primary model of technology acceptance, two implications, or as Davis calls those, two variables, play basic role in adopting information technology. Both two factors could be affected by the exogenous variables too; namely, profit (PU) and implication of easy application (PEOU). Both two beliefs in sum cause the establishment of an attitude towards using concerned system and in turn, affect the purposes and intentions of the usage; and ultimately, determine the level of actual use. The primary model of Davis could be shown in figure 2 [7].

![Figure 1: Model of Technology Acceptance. Sources: Lu et al (2009)](image1)

![Figure 2: Davis’s simplified model. Sources: Lu et al (2009)](image2)

The perceived usefulness is attributed to the degree of the belief a person has so, using a specific system could add to his performance level; that is, how much in person’s view, technology could affect on more usage of existing facilities in equal conditions? [8] The feasibility of the perceived usage is an attribution to the degree a person believes that using technology requires little or no physical and mental efforts [9]. Being specific and simple is the most distinguished characteristics of technology acceptance model and several researches have been carried out in this regards. The model of technology acceptance has used a series of basic beliefs that could be used in various positions [10]. There are different empirical evidences on the effects of implication of the user’s feasibility in using information technology. As mentioned above, Davis did not find any significant direct relationship between the two and concluded that the implication from the feasibility of application has been perceived via affecting the impacts of information technology usage. Many studies have emphasized on this, although there are studies that have confirmed a direct relations between the perceived feasibility and using infor-
information technology. Some researchers have concluded that implication of feasibility of application in the initial stages of the introduction and acceptance of new technology is effective in using that technology; however, as the time passes, its effects are reduced [11, 12].

In the present research, the categories that are used as scales for adopting information are:
1. The degree that a new innovation seems better in comparison to the previous innovation
2. The degree of consistency of the technology with consumers’ needs
3. Degree the innovation seems complicated
4. Amount of introducing innovation in trial form prior to its acceptance by consumer
5. The amount of observing innovation by potential acceptors
6. Amount of observing the results of innovation [13].

In present research the variable of perceived feasibility is measured by following categories.
1. Amount of perception of the organization’s program in connection with information technology
2. The degree of performing job affairs easier by using information technology
3. Degree of acquiring skills to work with information technology in the organization easier
4. Easier learning of working with information technology in the organization [14].

In present research the variable of perceived usefulness is measured by following categories.
1. Much faster to perform job tasks by using IT
2. Degree of job performance by using information technology
3. Degree of job tasks accuracy by using IT
4. Degree of increase in job tasks productivity by using IT.

2.2 Empowerment
In the personal level, enabling is related to the feeling of domination, competition and personal authority. In the interpersonal level; however, emphasis is made on the ability to influence on people who are in contact with the person. In political level, enabling emphasizes on social power or access to sources and opportunity to form them [15]. Personal enabling means improving the power of employees for decision-making and the process of increasing the employee’s value in the organization by the means of education, participation and team work tools [16]. The enabling policies in this research include the duty-based educations (proportion to the job) of employees and localization of education sources in the organization.

By localization of education sources, it means that those resources must be available specific to the organization and in compatibility with its needs and preferably, to use trained staff as educational resources [17].

3 RESEARCH DESIGN
3.1 Conceptual Model
With respect to theoretical and research issues which have been performed, the conceptual research model was presented in figure 3. In determining the variables of the research model in the past researches, especially Bendark and Ranel models [17]; Davis [5]; the researches performed by Rodgers [13] and the Marler & Fischer researches [18] were used. Based on the simplified model—technology acceptance- the two variables of the feasibility perceived from the information technology and the usefulness as perceived from information technology are considered as balancing variables. In this model, only the two factors of infraction technology acceptance variables are selected from Davis’s simplified model. The two other factors; that is, view and intention are not studied due to extensive researches that have already been performed in this field.
### 3.2 Research Hypothesis

Demirkaya et al. [19] in a research studied the relationship between the strategies of human resources and technology management. In their researches, they noted some of the policies of human resources that are effective in information technology acceptance. Dalkik et al. [20] in another research studied the effects of usefulness and perceived ease of use from information technology in which, the accuracy of the information technology acceptance model was approved. Bendark & Renel [17] in their research identified the human resources policies that affect the information technology acceptance; particularly the empowerment policies and on that basis, they use human resources management system for the successful application and acceptance of information technology. The hypotheses of its research which are developed based on the relevant researches are listed as follows:

**The first major hypothesis (H1):** Empowerment policies have positive and significant effects on the successful acceptance of information technology in the Iranian pharmaceutical industries production unit.

**Minor hypothesis (H1a):** Empowerment policies have positive and significant effects on the successful acceptance of information technology through perceived profitability in the Iranian pharmaceutical industries production unit.

**Minor hypothesis (H1b):** Empowerment policies have positive and significant effects on the successful acceptance of information technology through perceived feasibility in the Iranian pharmaceutical industries production unit.

### 3.3 Statistical Sample and Data Collection

The present research has been carried out in the Iranian pharmaceutical industry. Based on the information received from pharmacists syndicate, the Ministry of Industries of Iran, Ministry of Health and Medical Education and FAO, 100 production units are active in the Iranian pharmaceutical industry that constitute the statistical society of the research. With respect to the limited volume of the statistical society, 100 active units in drugs production area were selected as the statistical samples. In each production unit, the managing director, the senior manager of human resources, the senior management of information technology and the senior management of research and development filled the questionnaires. In addition, with respect to the volume of the sample, 400 questionnaires were distributed, 328 of which, equivalent to 82% of the total questionnaires were completed and returned.

### 3.4 Developing Questionnaire

The questionnaire of the present research has been developed by the research by using some of the questionnaires related to information technology acceptance, studying the literature review, and using the experts’ view. The questionnaire questions are closed end and Lickert Spectrum has been used in its development. The 5-unit Lickert scale has been used in designing the questionnaire; that includes very high, high, average, low and very low options. The questionnaire of this research consists of 16 statements for measuring the variables. Table 1 lists the questions of each variable and their numbers. The questions of the research questionnaire are presented in the appendix section.

#### TABLE 1

<table>
<thead>
<tr>
<th>Variables</th>
<th>Question numbers</th>
<th>Number of questions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Empowerment policies</td>
<td>1-2</td>
<td>2</td>
</tr>
<tr>
<td>Usefulness perceived from information technology</td>
<td>3-4-5-6</td>
<td>4</td>
</tr>
<tr>
<td>Feasibility perceived from information technology</td>
<td>7-8-9-10</td>
<td>4</td>
</tr>
<tr>
<td>Successful acceptance on information technology</td>
<td>11-12-13-14-15-16</td>
<td>6</td>
</tr>
</tbody>
</table>

### 4 Empirical Studies and Discussion

#### 4.1 Basic Information

Of the total 328 respondents to the questionnaire, 222 were men that constitute 67.7 percent of total respondents, 106 of them were females, making 32.3 percent of total respondents. Most respondents aged 31 to 40, making 41.2 percent of total society. Based on the collected data, most respondents; that is, 133 of them, had master’s degree, that constituted 40.5 percent of total respondents. 69 of the respondents were managing directors of the production units which made the least percent of frequency; i.e., 21 percent of total respondents. 91 of the respondents were information technology with 29.3 percent and 72 of them were research and development managers; making 22 percent of total respondents. In addition, the highest number of respondents; 89 individuals, had 10 to 15 years service records making 27.1 percent of total respondents.

### 4.2 Validity and Reliability of the Questionnaire

The contents credit method was used to confirm the reliability and validity of the research questionnaire. For this purpose, the views of guidance professors and a group of elites, information technology managers and the final questionnaire was extracted after making corrections. The questionnaire validity was calculated by using Cronbach Alfa. In the present research, to obtain the validity of the research questionnaire, 30 questionnaires were distributed and collected among primary samples. After making calculations by the software, the value of Cronbach Alfa was obtained to be 92.4% that showed high validity of the questionnaire. Therefore; it could be said that the questionnaire developed by the researcher has sufficient validity and the answers given to the questionnaire were not by chance or accident.

#### 4.3 Descriptive Analysis of Each Variable

Table 2 shows the mean average, criteria bias and the skewness of each category in a variable.

#### TABLE 2
4.4 Variables Correlation Test

Because all variables subject of study are ranked and normal, to analyze the relationship among them the Spearman Correlation Test was used. The assumption of the existence of positive correlations among research variables was proved. The correlation coefficient of variables is shown in Table 3.

<table>
<thead>
<tr>
<th>Variables</th>
<th>Correlation coefficient</th>
<th>Significance level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Empowerment policies</td>
<td>0.572</td>
<td>0.000</td>
</tr>
<tr>
<td>PU</td>
<td>0.533</td>
<td>0.000</td>
</tr>
</tbody>
</table>

4.5 Analysis of Confirmation Factor

Confirmation factor analysis has been used to study the suitability of the questions selected for the factors subject of study.

<table>
<thead>
<tr>
<th>Variables</th>
<th>Factorial load</th>
<th>Statistics t</th>
</tr>
</thead>
<tbody>
<tr>
<td>Empowerment policies</td>
<td>0.658</td>
<td>0.000</td>
</tr>
<tr>
<td>PU</td>
<td>0.617</td>
<td>0.000</td>
</tr>
</tbody>
</table>
According to the Lisrel output which is presented in the above-mentioned table, the amount obtained for \( \frac{c^2}{df} \) is equal to 2.34. Since this value should be less than 3 in the model, the suitability of the model scale is approved. The root square of the average approximation should be less than 0.08 and in the conceptual model; this value is equal to 0.028. The index of scaling properness and the balanced index of the scale accuracy should be higher than 0.9; the conditions are true in this model. With respect to the indexes and Lisrel software outputs, it could be said that the data is well in consistency with the model and the presented index shows this subject; that in sum, the presented model is a suitable model and the empirical data is in consistency with it.

4.6 Studying the Indexes of Conceptual Model

To study the conceptual model, first it is necessary to assess the generality of the model. In this part, to study the model, at least one of the indexes discussed in absolute scaling, relative scaling and adjusted scale was used. Table 5 shows the indexes extracted from scaling the model.

### TABLE 5

<table>
<thead>
<tr>
<th>statistics</th>
<th>CHI SQUARE</th>
<th>DF</th>
<th>CHI SQUARE/DF</th>
<th>RMSEA</th>
<th>GFI</th>
<th>AGFI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conceptual model</td>
<td>232.3</td>
<td>99</td>
<td>2.34</td>
<td>0.028</td>
<td>0.92</td>
<td>0.91</td>
</tr>
</tbody>
</table>

As it is shown in table 6 and figure 4, the standard coefficient of structural equations between the empowerment policies and the successful acceptance of information technology is 0.5 and its statistics amount T is equal to 2.25. Since the value of statistics T in the obtained structure equation with 95% certainty (1/96); thus, the hypothesis of positive and significant effects of empowerment policies on successful acceptance of information technology is approved with 95% certainty. In addition, the value of standard coefficient has positive mark; that is, by the increase and improvement of empowerment policies, the successful acceptance of information technology is also increased.

As table 6 and figure 4 show, the value of standard coefficient between the empowerment policies and the perceived usefulness from information technology is equal to 0.84 and its T statistics value is equal to 15.01 In addition, in connection with the perceived usefulness and the successful acceptance of information technology, the standard coefficient value of the structural equation is also equal to 0.33 and its T statistics is equal to 2.96. In both paths, the value of T Statistics in the structural equation obtained from statistics T is higher in 95% certainty (1.96). Therefore, the hypothesis of the existence of positive and significant effects of the empowerment policies on the perceived usefulness of information technology through perceived usefulness is equal to 0.277 with the T statistics equal to 2.87. Since the value of Statistics T is higher in 95% certainty (1.96); thus, the hypothesis of indirect effect of empowerment policies on successful acceptance of information technology via perceived usefulness is approved with 95% certainty. Based on the obtained results, it is shown that the indirect effects of empowerment policies on successful acceptance of information technology via perceived usefulness is equal to 0.046 with the T statistics equal to -0.5. Since the value of T statistics is lower than T statistics with 95% certainty (-1.96); thus, the hypothesis of indirect effects of empowerment policies on successful acceptance of information technology through perceived ease of use is not supported.
TABLE 6  
DIRECT AND INDIRECT EFFECTS

<table>
<thead>
<tr>
<th>Direction of path</th>
<th>Standard parameter</th>
<th>Statistics T</th>
<th>results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Empowerment policies and successful acceptance of the information technology</td>
<td>0.5</td>
<td>2.25</td>
<td>Supported</td>
</tr>
<tr>
<td>Empowerment policies on Perceived Usefulness of information technology</td>
<td>0.84</td>
<td>15.01</td>
<td>Supported</td>
</tr>
<tr>
<td>The indirect effect of empowerment policies on successful acceptance of information technology via perceived usefulness</td>
<td>0.277</td>
<td>2.87</td>
<td>Supported</td>
</tr>
<tr>
<td>Empowerment policies on the Perceived ease of use</td>
<td>0.92</td>
<td>12.70</td>
<td>Supported</td>
</tr>
<tr>
<td>The indirect effect of empowerment policy on the successful acceptance of information technology through perceived ease of use</td>
<td>-0.046</td>
<td>-0.5</td>
<td>Not Supported</td>
</tr>
<tr>
<td>The perceived ease of use on successful acceptance of information technology</td>
<td>-0.05</td>
<td>-0.29</td>
<td>Not Supported</td>
</tr>
<tr>
<td>The perceived usefulness on successful acceptance of information technology</td>
<td>0.33</td>
<td>2.96</td>
<td>Supported</td>
</tr>
</tbody>
</table>

5 Discussion and Conclusion

The present research has been carried out with the aim of studying the empowerment policies on the successful acceptance of information technology in the Iranian pharmaceutical industry. In line with the goal of the research and by using the literature and records of research, a number of hypotheses were discussed and were then tested. The results are studied and discussed in following part.

The first major hypothesis (H1) was based on the principle that the empowerment policies have positive and significant effects on successful acceptance of information technology in the Iranian pharmaceutical industry production unit. To study the relationship between the empowerment policies and successful acceptance of information technology, the descriptive statistics and the inductive statistics. The results showed that in view of the respondents, the empowerment policies existed in high and the categories of information technology acceptance existed in relatively high amount in the companies' subject of study. In the inductive statistics part, the first hypothesis studied the relationship between the empowerment policies and successful acceptance of information technology by using statistical tests. In this part, by using the path analysis technique and Spearman's correlation coefficient, it was specified that the empowerment policies had positive and highly significant effects on the successful acceptance of information technology. The correlation coefficient sign between the two variables is positive and shows that by an increase in the amount of empowerment policies, the amount of successful acceptance of information technology is increased as well and vice-versa. The results obtained are in agreement with the findings of Bondarouk & Ruël [17], Demirkaya et al [19], King & He [22] and Ghazizadeh Fard [23].

The minor hypothesis (H1a) was based on the principle that the empowerment policies had significant and positive effects in the successful acceptance of information technology in the pharmaceutical industry units of Iran through the suitability perceived from information technology. To study this hypothesis, the data was collected by using questionnaire and designing the questions and was analyzed in both descriptive and
The amount of standard coefficient between empowerment policies and successful acceptance of information technology in direct form was obtained as 0.5 and by the intervention of perceived usefulness, the number 0.277 was obtained. Thus, the total effect of empowerment policies on successful acceptance of information technology shows that the empowerment policies had positive and significant effects on the successful acceptance of this technology via perceived usefulness. The results that were obtained are in line with the findings of Bondarouk and, Rueal [17], Demirkaya et al [19], Leede & looise [24], Park [25], Ejei et al [25].

The results for the minor hypothesis (H2a) shows that there is no significant and positive effects between perceived ease of use and the successful acceptance of information technology at the pharmaceutical industry production unit of Iran. To study this hypothesis, by using the questionnaire and designing the questions, the information needed for studying the situation of empowerment policies, the perceived ease of use and successful acceptance of information technology was collected and was analyzed in the two descriptive and inductive parts. In the inductive statistics part, the effects of empowerment policies through perceived ease of use from information technology were studied by using statistics tests. In this part, by using path analysis technique and Spearman correlation coefficient, results showed there is no significant relationship between the empowerment policies and the and successful acceptance of information technology via perceived ease of use. Although there is effect between perceived ease of use and acceptance of information technology (by spearman correlation test) but this effect is not significant. The results which were obtained were in line with the findings of Davis [7]. Based on the researches of Lucas and Spilter [28] and Straub et al [27], in the initial stages of accepting a technology, there is a positive and significant relationship between the perceived feasibility and acceptance of that technology; however, as the time passes, this relationship becomes less significant. Therefore with respect to the results which are obtained, accepting information technology in the Iranian pharmaceutical industry has passed its initial stages.

REFERENCES

