The Effect of Using Cloud Computing On Ehealth of Government Agencies 
(Case Study: Government Agencies South Of West Azerbaijan Province)

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Abstract

The aim of this study was to determine the effect of cloud computing on eHealth in government agencies in the southern province of West Azerbaijan. The aim of this study is to be an applied research study. The research project is descriptive (non-experimental); it is the correlation and impact assessment. The population of this study included 1408 people from all government staff in the southern province of Western Azerbaijan. It is based on statistical governor. The sample size in this study is based on a sample of 289 people that has been calculated at the level of 0.05 times. Stratified random sampling method is used. The data was standardized by the use of questionnaire. Its content validity is confirmed. The reliability of electronic health questionnaire, with Cronbach's alpha 0.85 to 0.81, was obtained for computing clouds. To verify the hypotheses of correlation and linear regression, research normality of the data is used. R-squared value is equal to 0.011, which represents 1.1% of cloud computing; that is the effect of changes in e-health.

Keywords: Employing Cloud Computing, Ehealth, Cloud Group, Hybrid Cloud.
Introduction

Genesis of basic concepts of cloud computing dates back to the 1960s when John McCarthy stated that computation may someday be organized as a creation of the basic concepts utilities. Today almost all the features of cloud computing (elastic provision, provided as a public industry, and online access to an unlimited supply of illusion) compared with the power industry associations and public and private forms of public consumption Douglas Hill park in a book titled "general industry computer problem "in 1966 (Abu Khousa, 2012).

Now cloud computing is one of the most exciting technologies in the world because of lower cost, high flexibility and expandability. Currently, protecting the Internet cloud performance is a major challenge. In the meantime, security and privacy in the cloud users are very essential and critical. The realization of virtualization to increase security in cloud computing is one of the most effective solutions. In this technology, operating systems, middleware or application interface and application of a concrete copy are placed in a prefabricated physical computer or part of a server (Lin and Chen, 2012).

Any ideas or new methods have advantages and disadvantages, including the benefits of cloud computing such as lack of space and time limits, simple sharing resources and reducing capital and operational costs (the main advantage). This is because, in fact, computing dynamically gets scalable cloud resources as a service over the internet offers. Cloud computing also has lower security flaws, lack of privacy, limited access to the server, high cost of gang-related problems and vulnerabilities in servers to modify the conditions of economic crisis (Anderson, 2006).

Cloud computing is a model for easy access to a collection of computing resources. These resources (eg, networks, servers, storage, applications and services) are subject to change and configuration. In cloud computing, resource management and the direct involvement of suppliers are minimized and services are provided or released quickly. Always a cloud subsidy is configured in two parts. The software used to communicate with the terminal portion is used as component (Shahzad, 2014).

E-health is a new and growing field of public health and trade. Intersection with electronic information has provided or strengthened health information and services via the Internet and related technologies reference. In a wider sense, the term refers not only to technological development but also to promoting local regional and international context of comprehensive care with the use of IT and communications technology. The purpose of this definition is to create a dynamic environment for greater use of computers and the Internet in the field of e-health (Marston, 2011).

Government agencies in southern province of Western Azerbaijan have a great staff and require the use of electronic systems and facilities so that they can provide security and e-health.
Cloud computing is so popular today. Today, health benefits of this new environment. Thus the expansion of health care is impossible without the use of computers and technology. To further explain why this application is needed in various spheres is the concern of the below examined case the case.

So, this study was done to answer this question: what is the effect of using cloud computing in government agencies eHealth in the south of West Azerbaijan province?

Methods

The aim of this study is to be an applied research one. The research project is descriptive (non-experimental); it is the correlation and impact assessment. The study was descriptive in nature and is based on library studies. The population of this study included all government staff in the southern province of Western Azerbaijan that is 1480 persons. The sample size in this study is based on a sample of 289 people that has been calculated at the level of 0.05 times. Random sampling method is used due to the large sample population of this study.

In order to assess the hypotheses, researchers will need the right tools to use. Standardized most common and most suitable questionnaires are used. E-health questionnaires of Budineh (2015) and standard questionnaire of cloud computing in government agencies (2015) have been used. Validity by experts in management and reliability of electronic health questionnaire with Cronbach’s alpha 0.85 to 0.81 was obtained for computing clouds. Pearson and linear regression were used to analyze, classify and summarize descriptive data on software and descriptive statistics including frequency, percentage, tables, graphs, mean scores and standard deviations and to test hypotheses of the Kolmogorov-Smirnov test.

Results

Kolmogorov – Smirnov Test

According to the Kolmogorov – Smirnov, if the significance level for all independent and dependent variables is larger than the surface of the test (0.05), distribution of data is normal.

Table 1. Results of Kolmogorov – Smirnov test

<table>
<thead>
<tr>
<th>Variable</th>
<th>Error</th>
<th>Sig</th>
</tr>
</thead>
<tbody>
<tr>
<td>cloud computing</td>
<td>0.05</td>
<td>0.138</td>
</tr>
<tr>
<td>E-Health</td>
<td>0.05</td>
<td>0.141</td>
</tr>
<tr>
<td>use of public cloud</td>
<td>0.05</td>
<td>0.055</td>
</tr>
<tr>
<td>Using group cloud</td>
<td>0.05</td>
<td>0.063</td>
</tr>
<tr>
<td>Using hybrid cloud</td>
<td>0.05</td>
<td>0.119</td>
</tr>
<tr>
<td>using the private cloud</td>
<td>0.05</td>
<td>0.055</td>
</tr>
</tbody>
</table>

When investigating the data normalization, we test the null hypothesis that the data is normally distributed and based on the level of 5%. So, if the statistic error level is greater than or equal to
0.05 achieved, then the reason to reject the null hypothesis would not exist. In other words, the data is normally distributed. The above table indicates that data distribution is normal and should use the parametric tests to test the linear regression between the dependent and independent variables.

**Testing of Main Hypothesis**

The use of cloud computing affects e-Health of government agencies in the south of West Azerbaijan province.

The beta on the table (.287), whether it really fits this pattern data, has been tested. If the table is less than 5%, significance indications are that the model is right and fitting data. Since it represents less than 5%, significance level model is fitted (Significance amount that reflects the significance level of less than 0.05 linear relationship between the use of cloud computing and e-Health).

R-squared value is equal to 0.011, which represents 1.1% of e-Health affected by the application of cloud computing is changing the linear regression equation according to data from the following table as:

<table>
<thead>
<tr>
<th>Model</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
<th>t</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>Std. Error</td>
<td>Beta</td>
<td></td>
</tr>
<tr>
<td>1 (Constant)</td>
<td>2.286</td>
<td>.191</td>
<td>11.951</td>
<td>.000</td>
</tr>
<tr>
<td>Cloud Computing</td>
<td>.236</td>
<td>.047</td>
<td>.287</td>
<td>5.068</td>
</tr>
</tbody>
</table>

**Testing of first sub-hypothesis**

Public cloud affects e-Health of government agencies in the south of West Azerbaijan province. The beta on the table (.292), whether it really fits this pattern data, significance is less than 5 percent test. The table is a sign that the model is right and data is fitting. Since it represents less than 5%, significance level model is fitted (Significance amount that reflects the significance level of less than 0.05 linear relationship between the use of public cloud and e-health). R-squared value is equal to 0.082, which represents 8.2% of the public cloud; it is the effect of changes in e-health linear equation according to data from the table below:
Testing of second sub-Hypothesis

Using group cloud-based affects e-Health of government agencies in the south of West Azerbaijan province.

Due to beta on the table (.145), whether it really fits this pattern data, Significance is less than 5 percent test. The table is a sign that the model is right and data is fitting. Since it represents less than 5%, significance level model is fitted (Significant amount that reflects the significance level of less than 0.05 linear relationship between a cloud application and e-health). R-squared value is equal to 0.085, which represents 8.5% of electronic health changes under the effect of clouds; it is a linear equation according to data from the table below:

Table 4: Coefficient of regression effect of using cloud group

<table>
<thead>
<tr>
<th>Model</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
<th>t</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>Std. Error</td>
<td>Beta</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>(Constant)</td>
<td>2.879</td>
<td>.150</td>
<td>19.179</td>
</tr>
<tr>
<td>cloud group</td>
<td>.094</td>
<td>.038</td>
<td>.145</td>
<td>2.481</td>
</tr>
</tbody>
</table>

Testing of third sub-hypothesis

Using Hybrid cloud affects e-Health of government agencies in the south of West Azerbaijan province.

Due to beta on the table (.185), whether it really fits this pattern data, Significance is less than 5 percent test. The table is a sign that the model is right and data is fitting. Since it represents less than 5% significance level model is fitted. (Significant amount that reflects the significance level of less than 0.05 linear relationship between the use of hybrid cloud and e-health).

R-squared value is equal to 0.021, which represents 2.1% of electronic health changes under the effect of applying the hybrid cloud; it is a linear equation according to data from the table below:
Table 5: Coefficient of regression effect using hybrid cloud

<table>
<thead>
<tr>
<th>Model</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
<th>t</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>Std. Error</td>
<td>Beta</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>(Constant)</td>
<td>2.714</td>
<td>.169</td>
<td>16.069</td>
</tr>
<tr>
<td>hybrid cloud</td>
<td>.138</td>
<td>.043</td>
<td>.185</td>
<td>3.188</td>
</tr>
</tbody>
</table>

Testing of fourth sub-hypothesis

Using the private cloud affects e-Health of government agencies in the south of West Azerbaijan province.

Due to the beta on the table (.107), whether it really fits this pattern data, Significance is less than 5 percent test. The table is a sign that the model is right and data is fitting. Since it represents less than 5%, significance level model is fitted. (Significant amount that reflects the significance level of less than 0.05 linear relationship between the use of private cloud and e-health)

R-squared value is equal to 0.034, which represents 3.4% of private cloud; it is the effect of changes in e-health linear equation according to data from the table below:

Table 5: Coefficient of regression effect using private cloud

<table>
<thead>
<tr>
<th>Model</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
<th>t</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>Std. Error</td>
<td>Beta</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>(Constant)</td>
<td>2.902</td>
<td>.190</td>
<td>15.304</td>
</tr>
<tr>
<td>private cloud</td>
<td>.093</td>
<td>.051</td>
<td>.107</td>
<td>3.826</td>
</tr>
</tbody>
</table>

Discussion and Conclusion

The use of cloud computing affects e-Health of government agencies in the south of West Azerbaijan province:

Whether it really fits this data pattern, test Significance is less than 5%. The table is a sign that the model is right and fitting data. Since it represents less than 5%, significance level model is fitted (Significance amount reflects the significance level of less than 0.05 linear relationship between the use of cloud computing and e-health). R-squared values are equal with 0.011, which represents 1.1% of the variation. The use of cloud computing affected eHealth.
According to the results of this study and in comparison with the study of Lin and Chen (2012) cloud computing is an innovation: the perceived attitude and application, benefiting from the dissemination of innovation theory Rogers introduces five of comparative advantages, compatibility, and test-taking view of the complexity of applying an innovation have an important effect.

According to the results of this study and comparison with the research of Gupta et al (2008) in their study, the use of cloud computing by small and medium businesses, factors such as cost reduction, ease of use and persuasiveness, confidence, cooperation and sharing security and privacy in the use of cloud computing affect small and medium sized firm.

**Using Public cloud affects e-Health of government agencies in the south of West Azerbaijan province:**

Whether it really fits this data pattern, Significance is less than 5 percent test. The table is a sign that the model is right and data is fitting. Since it represents less than 5%, significance level model is fitted. (Significant amount that reflects the significance level is less than 0.05 linear relationship between the use of public cloud and e-health).

R-squared value is equal to 0.082, which represents 8.2% of the public cloud; it is the effect of changes in e-health.

According to research results and in comparison with the Moghadasi (2011) in his thesis titled “A Survey of Iran in the world, such as the eHealth e-Health Today” there is a very important role in improving the quality of health care and equitable distribution of health in various societies. But there are significant differences in the use of e-health reason for the difference in the use of e-health in different countries around the world in terms of the potential of ICT, health and across the world. In this regard, in Iran the creation of electronic health measurement indicators of the realization of the goal and the basic step through which they create clear vision of electronic health situation of the country are compared to other countries.

**Using cloud-based group affects e-Health of government agencies in the south of West Azerbaijan province:**

Whether it really fits this pattern data, Significance is less than 5 percent test. Since it represents less than 5% significance, level model is fitted. (Significant amount that reflects the significance level of linear relationship is less than 0.05 between a cloud application and e-health) R-squared value is equal to 0.085, which represents 8.5% of the effect of changes in e-health that is a cloud.

According to the results of this study and in comparison with the study of Ghobadpour et al (2014) about cloud to cloud library and cloud computing model’s design library, it is not inconceivable that this change in provision of information services, libraries and information
centers is experiencing a fundamental transformation. The changing face of a new wide range of libraries will be both in terms of structure and service delivery. This study on library analysis reviews the literature on the concept of cloud computing, as well as investigating and introducing its models, along with providing an overview of developments in the fields ahead provide information services, to explain the theoretical foundation of cloud library. This type library is a solution to some problems of digital libraries including the right of authors and also it offers capabilities and facilities of the libraries. During the investigation, it was determined how various models of cloud computing, and the application features a library would tell mission, community, customers and the amount of financial resources, the application of any model or combination of them.

Current descriptive study was conducted in two stages in 2013: the first stage used qualitative interviews with 93 families in eight provinces according to four levels of human development indicators to identify the different components of household health expenditure and in the next step the expert panel was identified by content analysis components. It influenced the development of eHealth on any component of household health expenditure review and components in three categories: direct, indirect and ineffective. The development of eHealth can be used as a strategy to reduce the share of public health costs taking into account, of course, that the creation of information and communication technology infrastructure and inter-sectoral collaboration for the benefit of the results of the strategy are essential.

Using Hybrid cloud affects e-Health of government agencies in the south of West Azerbaijan province:

Whether it really fits this pattern data, significance level is less than 5 percent test. The table is a sign that the model is right and data is fitting. Since it represents less than 5%, significance level model is fitted (significant amount that reflects that the significance level of linear relationship is less than 0.05 between the use of hybrid cloud and e-health). R-squared value is equal to 0.021, which represents 2.1% of hybrid cloud that is the effect of changes in e-health.

According to the results of this study and in comparison with the research of Ashouri et al (2015), we examine cloud computing from the perspective of business strategies for eliminating or reducing their weaknesses and threats. In this study, cloud systems with components that are required to implement the cloud a company’s business, from a business perspective is studied. The core technology concepts and then SWOT analysis for small and medium businesses in the cloud explained the challenges. The proposed strategies to convert weaknesses into strengths and threats into opportunities are presented. The institutionalization of proposed strategies to reduce costs and increase productivity in organizations and ordinary users are considerable and that, in turn increasing businesses profitability are associated with cloud computing.

According to research results and in comparison with Shokuhi et al (2014), we identify and rank key factors influencing the adoption of cloud computing in their eHealth. Based on the
literature review and technological-organization environment and human and technological fitness model, the following 16 criteria identified by the survey of 60 experts were ranked. According to the new issue of the review of existing literature, no study has identified these criteria. The results show that the experts' opinions when making decisions regarding the application of cloud computing in e-health need factors, technological, human, and environmental organizations be considered.

Using private cloud affects e-Health of government agencies in the south of West Azerbaijan province:

Whether it really fits this pattern data, significance level is less than 5 percent test. The table is a sign that the model is right and data is fitting. (Significant amount reflects that the significance level of linear relationship is less than 0.05 between the use of private cloud and e-health). R-squared value is equal to 0.034, which represents 3.4% of e-health changes the effect of using the private cloud.

According to research results and in comparison with Jacoby et al (2014), we identify and rank the risk factors that discussed cloud computing in government agencies. The aim of this research is to identify and rank the risk factors in government agencies using cloud computing of the IT expert opinion. First review of key articles, extraction and comprehensive list of risk were classified in two categories: tangible and the invisible. Then the 6 experts regarding these risks and their classification were interviewed and 10 risks were identified. After that, the poll of 52 experts and with the help of fuzzy AHP was ranked this risk. The results show that experts have identified intangible risks as the most important risks in the use of cloud computing in government agencies. The risk of “data confidentiality” has won first place.
References


