Strategic Planning For Implementing
E-Government In Iran: Formulating the Strategies

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Abstract
The concept of “electronic government” (e-government) recently introduced as a consequence of IT in the knowledge and information age and has been applied by many governments around the world in practice. Iranian authorities also have decided to take the essential methods required for implementing e-government in Iran. However, the large size of the government in Iran and many other problems such as the lack of required legal, institutional and human resources infrastructures make the planning and implementation a difficult task. In this paper, strategic planning and multi-criteria decision making approaches are used to formulate e-government implementation strategies in Iran. Firstly, through analyzing Iran situation, the restricting as well as the enhancing parameters are identified. Secondly, by considering e-government vision and goals in Iran, initial strategies are determined. Then by taking into account the restricting and enhancing parameters, the feasibility of initial strategies are studied. Finally, by considering the e-government main strategy in Iran the feasible strategies are determined and their priorities are identified.

Key words: electronic government (e-government), strategic planning, restricting and enhancing parameters, and TOPSIS.

Introduction
Nowadays, the information and communication technologies (ICT) have taken the consideration of government and using ICT in government processes leads to e-government concept. E-government interacts with citizens, business and government [1]. These interactions form three aspects of e-government: G2C⁵, G2B⁶, G2G⁷ [2]. E-government means applying information and communication technologies by government agencies to communicate with citizens, business and themselves in order to prepare and deliver services effectively and efficiently [3]. There are three kinds of government services, which are information, interactive and transaction services [1], [2], [4]. While providing information services is easier than the others, they usually appear in the primary steps of e-government implementation, thereby required information are available to the customers of government. If the relation between government and costumers goes beyond transferring information, i.e. the costumers are allowed to ask for services or special objects, then the services become interactive. Transaction services are the advanced e-government relationship, thereby the government communicates with costumers electronically. Preparing this kind of services needs the essential infrastructures and communication tools.

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E-government enables all government services to be accessible through several access channels like digital TV, call centers, and Internet [5],[6]. The e-government structure consists of two main parts: back office and front office. In back office, services and information are prepared to present in front office. Security systems for protecting the government, interoperability, communication standards, and one-stop-portal are the essential parts of back office [6], [7]. The structure of e-government has been shown in Figure 1. As illustrated in Figure 1, for developing e-government some basic essentials must take into consideration including one-stop-portal, interoperability, security, and public access [8], [9].

Analyzing the Affecting Areas
According to the strategic planning literature, the areas, which affect implementing e-government in Iran, must be determined [10], [11]. In strategic planning for a typical company, it is necessary to separate the areas into two main categories: external and internal environment. However, for this case, e-government implementation, this task is too difficult even impossible. Therefore, in this paper, we have classified the affecting areas into two categories: restricting and enhancing parameters.

The restricting parameters limit e-government implementation. In fact, they act as barriers. The enhancing parameters are those parameters that accelerate e-government implementation. By studying Iran's circumstances in terms of implementing e-government a list of restricting and enhancing parameters is obtained [12], [13], [14].
We have categorized the parameters into 8 different areas. In table 1 the restricting and enhancing parameters have been shown.

Table 1. Enhancing and restricting parameters

<table>
<thead>
<tr>
<th>Area</th>
<th>Enhancing parameters</th>
<th>Restricting parameters</th>
</tr>
</thead>
</table>
| The level of ICT application among        | - Using variety of soft wares in the agencies  
| governmental agencies                    | - Applying different databases the agencies  
|                                           | - The existence of Local network (LAN) in the majority of governmental agencies  
|                                           | - Using WAN in some agencies  
|                                           | - The linkage between governmental agencies and Internet  
|                                           | - Providing information services throughout Internet for customers                     | - The lack of ICT master plan in many agencies  
|                                           |                                                                                     | - The lack of web-based applications  
|                                           |                                                                                     | - Not having shared databases  
|                                           |                                                                                     | - Improper IT responsible body in organizational chart of agencies  
|                                           |                                                                                     | - The lack of appropriate support for the information provided on agencies’ websites |
| Governmental policies, regulations and    | - Focusing on IT in the government Master Plan  
| plans                                      | - Tending to have a responsible body for IT and e-government  
|                                           | - Many managers familiar with the application of IT in government                     | - The lack of e-government responsible body  
|                                           |                                                                                     | - The lack of required regulations, procedures to support e-government implementation |
| Economy and Society                       | - The high rate of well-literate people  
|                                           | - The high rate of youth population  
|                                           | - Vast geographical territory  
|                                           | - Youth tendency to use computer and Internet  
|                                           | - Decrease in the rate of poor people in recent years  
|                                           | - Increase in the national income in recent years  
|                                           | - Moving towards equal distribution of income among the society                       | - Digital divide  
|                                           |                                                                                     | - The high cost of IT training  
|                                           |                                                                                     | - The high price of hardware  
|                                           |                                                                                     | - Vast geographical territory  
|                                           |                                                                                     | - The lack of training facilities in rural and urban areas  
|                                           |                                                                                     | - Low national income in comparison with developed countries |
| Workforce                                  | - Many training institutes  
|                                           | - High salaries in IT area  
|                                           | - Many IT students in the country  
|                                           | - Many IT experts in the country  
|                                           | - Many IT faculty members in the Iranian academic society                              | - Steady growth in training systems  
|                                           |                                                                                     | - Very low salaries for IT experts in comparison with other countries  
|                                           |                                                                                     | - Experts immigrate from Iran to abroad |
| Software and hardware market, export and   | - Many software producers in the country  
| import                                     | - Increase in the allocated foreign currency to import software  
|                                           | - The high rate of computer production and its accessories                             | - The low quality of in-house hardware  
|                                           |                                                                                     | - The lack of essential knowledge among in-house hardware producers  
|                                           |                                                                                     | - The lack of large scale producers with world-class specifications |
| IT companies                               | - Decrease in the number of full-time experts in IT companies  
|                                           | - Variety of IT companies in the country  
|                                           | - Highly skilled experts in IT companies                                              | - Decrease in the number of experts graduated from universities |
| Telecommunications and communications      | - Increased number of international telecommunication channels  
|                                           | - Increased capacity of data-transferring lines                                       | - The low rate of phone lines such as mobile lines  
|                                           | - The growth of phone lines such as mobile lines                                      | - The lack of transaction services  
|                                           |                                                                                     | - Weakness in delivering transaction services to citizens |
| E-government preparation in Iran           | - Development of Government Network  
|                                           | - Accessing to government typical forms through the websites  
|                                           | - Increase in the number of organizations connected to Government Network  
|                                           | - Designing the Government Website as the e-government portal                         | - Weakness in providing information services for people through government websites  
|                                           |                                                                                     | - The lack of transaction services  
|                                           |                                                                                     | - Weakness in delivering transaction services to citizens |
Vision and Goals of E-Government in Iran

The vision of e-government indicates how it will look like in the future. For determining e-government vision for Iran, e-government vision of other countries as well as the master plans of Iran has been studied [15], [16]. The vision for Iran is: “Becoming the first country in the Middle East by applying ICT in government processes to improve information and services delivery to citizens and business”.

To set the goals, Iran situation as well as other countries e-government goals and plans have been studied [7], [17], [18], [19], [20]. Thus, the goals for e-government implementation in Iran are as follows:

- Providing convenient access for all to government information and services
- Improving public services and providing integrated ones
- Downsizing the government and increasing its flexibility
- Promoting social welfare, awareness and knowledge in the society
- Declining bureaucracy throughout government processes
- Encouraging people’s participation in government
- Increasing government efficiency and effectiveness

E-Government Implementation Strategies in Iran

According to strategic planning approaches, after determining e-government implementation goals, the strategies are discussed. To define strategies, we have considered not only the goals but also the restricting and enhancing parameters. Table 2 shows the initial obtained strategies.

<table>
<thead>
<tr>
<th>ID</th>
<th>Strategy</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Concentrating on centralized management of e-government</td>
</tr>
<tr>
<td>2</td>
<td>Reengineering government processes</td>
</tr>
<tr>
<td>3</td>
<td>Promoting IT training among people</td>
</tr>
<tr>
<td>4</td>
<td>Enhancing financial resources</td>
</tr>
<tr>
<td>5</td>
<td>Encouraging private sector to support e-government related projects and creating a competitive environment</td>
</tr>
<tr>
<td>6</td>
<td>Defining, approving and issuing the essential standards</td>
</tr>
<tr>
<td>7</td>
<td>Defining, approving and executing the required regulations and procedures</td>
</tr>
<tr>
<td>8</td>
<td>Benchmarking from successful e-government projects</td>
</tr>
<tr>
<td>9</td>
<td>Avoiding digital divide</td>
</tr>
<tr>
<td>10</td>
<td>Developing and enhancing the Government Network</td>
</tr>
<tr>
<td>11</td>
<td>Promoting the culture of using ICT among people</td>
</tr>
<tr>
<td>12</td>
<td>Delivering and integrating government services and information electronically</td>
</tr>
<tr>
<td>13</td>
<td>Developing essential mechanisms for government-people interaction</td>
</tr>
</tbody>
</table>

To determine the feasibility of each initial strategy, first, we have considered a weight for each enhancing and restricting parameters, and their weights have been normalized. Second, the effect of each enhancing and restricting parameter on each initial strategy has been determined. Therefore, we can define:

\[ c_{ij} = \text{the effect of restricting parameter } j \text{ on strategy } i \]
\[ r_{ij} = \text{the effect of enhancing parameter } k \text{ on strategy } i \]
\[ w_j = \text{the weigh of restricting parameter } j \]
\[ v_j = \text{the weigh of enhancing parameter } k \]
\[ i = 1, 2, ..., 13 \quad j = 1, 2, ..., 36 \quad k = 1, 2, ..., 25 \]

Therefore, the aggregate effect of enhancing parameters on strategy \( i \) (\( E_i \)) is as follows:

\[ E_i = \sum_{j=1}^{36} w_j \ e_{ij} \]

and the aggregate effect of restricting parameters on strategy \( i \) (\( R_i \)) is as follows:

\[ R_i = \sum_{j=1}^{25} v_j \ r_{ij} \]

Consequently, if \( E_i > R_i \) for strategy \( i \), then the strategy is feasible, otherwise it is not feasible. In table 3 the aggregate effect of restricting and enhancing parameters on each strategy has been shown and the feasible strategies have been determined.
Table 3. Initial strategies feasibility

<table>
<thead>
<tr>
<th>Strategy Code</th>
<th>Enhancing parameters influences</th>
<th>Restricting parameters influences</th>
<th>Feasibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>129.78</td>
<td>158.69</td>
<td>Non-feasible</td>
</tr>
<tr>
<td>2</td>
<td>136.75</td>
<td>134.11</td>
<td>Feasible</td>
</tr>
<tr>
<td>3</td>
<td>199.39</td>
<td>161.1</td>
<td>Feasible</td>
</tr>
<tr>
<td>4</td>
<td>123.81</td>
<td>116.66</td>
<td>Feasible</td>
</tr>
<tr>
<td>5</td>
<td>144.21</td>
<td>111.89</td>
<td>Feasible</td>
</tr>
<tr>
<td>6</td>
<td>149.16</td>
<td>142.04</td>
<td>Feasible</td>
</tr>
<tr>
<td>7</td>
<td>144.69</td>
<td>140.44</td>
<td>Feasible</td>
</tr>
<tr>
<td>8</td>
<td>139.23</td>
<td>116.65</td>
<td>Feasible</td>
</tr>
<tr>
<td>9</td>
<td>162.6</td>
<td>152.37</td>
<td>Feasible</td>
</tr>
<tr>
<td>10</td>
<td>173.54</td>
<td>165.86</td>
<td>Feasible</td>
</tr>
<tr>
<td>11</td>
<td>180</td>
<td>158.73</td>
<td>Feasible</td>
</tr>
<tr>
<td>12</td>
<td>182.99</td>
<td>191.24</td>
<td>Non-feasible</td>
</tr>
<tr>
<td>13</td>
<td>160.58</td>
<td>155.54</td>
<td>Non-feasible</td>
</tr>
</tbody>
</table>

Table 4 shows the feasible strategies for implementing e-government in Iran.

Table 4. Feasible Strategies

<table>
<thead>
<tr>
<th>Code</th>
<th>Strategy</th>
</tr>
</thead>
<tbody>
<tr>
<td>St01</td>
<td>Reengineering government processes</td>
</tr>
<tr>
<td>St02</td>
<td>Promoting IT training among people</td>
</tr>
<tr>
<td>St03</td>
<td>Enhancing financial resources</td>
</tr>
<tr>
<td>St04</td>
<td>Encouraging private sector to support e-government related project and creating a competitive environment</td>
</tr>
<tr>
<td>St05</td>
<td>Defining, approving and issuing the essential standards</td>
</tr>
<tr>
<td>St06</td>
<td>Defining, approving and executing the required regulations and procedures</td>
</tr>
<tr>
<td>St07</td>
<td>Benchmarking from successful e-government projects</td>
</tr>
<tr>
<td>St08</td>
<td>Avoiding digital divide</td>
</tr>
<tr>
<td>St09</td>
<td>Developing and enhancing the Government Network</td>
</tr>
<tr>
<td>St10</td>
<td>Promoting the culture of using ICT among people</td>
</tr>
</tbody>
</table>

Setting priorities for feasible strategies

To determine the priorities of the feasible strategies, TOPSIS method has been applied [21], [22]. TOPSIS is known as a method in multiple attributes decision-making. It is a method for ranking some alternatives according to different attributes.

TOPSIS has seven steps, which are:

- **Step 1: Creating and Quantifying Decision Matrix**
  
  \[
  \begin{bmatrix}
  A_{1} & \cdots & A_{m} \\
  V_{1} & \cdots & V_{n}
  \end{bmatrix}
  \]
  
  \text{attributes} 

- **Step 2: Determining weight of attributes**

- **Step 3: Forming the weighted normalized decision matrix**
  
  \[ V = \left[ \begin{array}{c|c|c|c|c|c|c|c}
  V_{1} & V_{2} & \cdots & V_{n}
  \end{array} \right] \]

- **Step 4: Computing ideal and negative-ideal solutions**
  
  \[ A^{+} = \left\{ \max_{i,j} V_{i} \right\}, \left\{ \min_{i,j} V_{i} \right\} \] 
  
  \[ A^{-} = \left\{ \min_{i,j} V_{i} \right\}, \left\{ \max_{i,j} V_{i} \right\} \]
• Step 5: Determining separation of each alternative from ideal and negative ideal solution

Separation of \(i\)-th alternative from ideal solution \(d^+_i = \left\{ \sum_{j=1}^{n} (V^+_{ij} - V^*_{ij})^2 \right\}^{0.5}\)

Separation of \(i\)-th alternative from negative ideal solution \(d^-_i = \left\{ \sum_{j=1}^{n} (V^-_{ij} - V^*_{ij})^2 \right\}^{0.5}\)

• Step 6: Calculating closeness of each alternative to the ideal solution

\[c_{i}^{l} = \frac{d^+_i}{d^+_i + d^-_i}, \quad i=1, 2, ..., m\]

• Step 7: Ranking alternatives according to \(c_{i}^{l}\)

In this paper the feasible strategies form the alternatives, and the attributes, which some of them reflect the specifications of the e-government main strategy [23] are as follows:

1. Interoperability among government agencies
2. The qualification of service delivery through the websites
3. Strategy possibility in terms of required resources
4. Transparency of the strategy outcomes
5. Easier access to internal human resources than external ones
6. Easier access to internal sources than external ones
7. Stability of strategy in terms of environmental changes
8. Strategy compatibility with Iran circumstances

In order to determine weight vector of attributes, pair comparison has been used. The vector is as follows:

\[W= (0.187, 0.162, 0.138, 0.084, 0.116, 0.147, 0.242)\]

Hence, according to step 3 of TOPSIS method, by forming and normalizing the decision matrix, the weighted normalized decision matrix is obtained which is as follows:

\[
\begin{bmatrix}
0.045 & 0.031 & 0.008 & 0.004 & 0.037 & 0.040 & 0.011 & 0.070 \\
0.045 & 0.031 & 0.023 & 0.012 & 0.037 & 0.057 & 0.008 & 0.050 \\
0.045 & 0.073 & 0.039 & 0.020 & 0.037 & 0.057 & 0.011 & 0.070 \\
0.105 & 0.073 & 0.054 & 0.028 & 0.052 & 0.057 & 0.008 & 0.050 \\
0.075 & 0.052 & 0.054 & 0.036 & 0.052 & 0.057 & 0.011 & 0.089 \\
0.075 & 0.052 & 0.054 & 0.036 & 0.037 & 0.057 & 0.011 & 0.070 \\
0.105 & 0.031 & 0.008 & 0.036 & 0.037 & 0.057 & 0.008 & 0.050 \\
0.105 & 0.031 & 0.023 & 0.028 & 0.052 & 0.024 & 0.002 & 0.010 \\
0.075 & 0.031 & 0.039 & 0.028 & 0.052 & 0.057 & 0.005 & 0.070 \\
0.045 & 0.031 & 0.023 & 0.020 & 0.037 & 0.040 & 0.005 & 0.010 \\
\end{bmatrix}
\]

Consequently, we can determine the ideal and negative-ideal solutions. Also the separation of each alternative from ideal and negative-ideal solutions can be identified according to step 4 of TOPSIS method:

ideal solution \(A^+ = \{0.105, 0.073, 0.054, 0.036, 0.052, 0.057, 0.011, 0.089\}\)

negative ideal solution \(A^- = \{0.045, 0.031, 0.008, 0.004, 0.037, 0.024, 0.002, 0.010\}\)

Finally, we can rank the alternatives (strategies) by the use of their relative closeness to the ideal solution (step 5 and 6 of TOPSIS method). Table 5 shows the results in summary.
Table 5. Separation from ideal and negative-ideal solution and relative closeness of each alternative

<table>
<thead>
<tr>
<th>Strategy code</th>
<th>Separation from negative-ideal solution ( (d^-_i) )</th>
<th>Separation from ideal solution ( (d^+_i) )</th>
<th>Relative closeness to ideal solution ( (c^+_i) )</th>
</tr>
</thead>
<tbody>
<tr>
<td>St01</td>
<td>0.062</td>
<td>0.097</td>
<td>0.392</td>
</tr>
<tr>
<td>St02</td>
<td>0.054</td>
<td>0.093</td>
<td>0.369</td>
</tr>
<tr>
<td>St03</td>
<td>0.087</td>
<td>0.069</td>
<td>0.559</td>
</tr>
<tr>
<td>St04</td>
<td>0.105</td>
<td>0.041</td>
<td>0.720</td>
</tr>
<tr>
<td>St05</td>
<td>0.110</td>
<td>0.037</td>
<td>0.751</td>
</tr>
<tr>
<td>St06</td>
<td>0.096</td>
<td>0.044</td>
<td>0.684</td>
</tr>
<tr>
<td>St07</td>
<td>0.085</td>
<td>0.075</td>
<td>0.531</td>
</tr>
<tr>
<td>St08</td>
<td>0.068</td>
<td>0.101</td>
<td>0.403</td>
</tr>
<tr>
<td>St09</td>
<td>0.085</td>
<td>0.058</td>
<td>0.594</td>
</tr>
<tr>
<td>St10</td>
<td>0.028</td>
<td>0.116</td>
<td>0.192</td>
</tr>
</tbody>
</table>

According to the last column of table 5, the ranking of strategies will be as follow:

1. Defining, approving and issuing the essential standards
2. Encouraging private sector to support e-government projects and creating a competitive environment
3. Defining, approving and executing the required regulations and procedures
4. Developing and enhancing the Government Network
5. Enhancing financial resources
6. Benchmarking from successful e-government projects
7. Avoiding digital divide
8. Reengineering government processes
9. Promoting IT training among people
10. Promoting the culture of using ICT among people

Conclusion
In this paper, the e-government implementation strategies in Iran are formulated by the use of strategic planning and multiple attributes decision-making. First, Iran circumstances in terms of ICT project implementation have been studied. The result of this studying forms the enhancing and restricting parameters for implementing e-government in Iran. According to the vision and goals for implementing e-government in Iran, thirteen initial strategies have been considered.

By taking into account the restricting and enhancing parameters, the feasible strategies are determined. Finally, according to the e-government main strategy for Iran, and by the use of TOPSIS method, the ranking of feasible strategies are introduced. Hence, to implement e-government in Iran, at first, we have to concentrate on defining, approving and issuing the essential standards.

References

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