

THE NECESSARY FACTORS AND CONDITIONS IN UTILIZATION OF STRATEGIC INFORMATION SYSTEMS

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Abstract

Necessity of Information Systems is inevitable for each organization; however, there are few organizations that are completely satisfied of Information Systems and it can be said that one of most important reasons is lack of one strategic attitude. Strategic Information Systems are discussed because of aligning Information Systems development and business goals and the first step is construction of appropriate Information Systems. These systems are considered as the main strategic tool and weapon in many organizations. This competitive advantage is result of recognizing opportunities and consequently effective and fast implementation of Information Technologies for their utilization. In this research, the relation between research variables such as recognition, managers and individuals' utilization and understanding of Information Technology advantages, Information Systems and utilization of these systems due to their dependence to studied organization's activities are reviewed and their effect and role in organization's planning are studied. Results indicate that in studied organization and most of the similar organizations, recognition of managers from advantages of Information Technology/ Information Systems for utilization of Strategic Information Systems is low. By means of his research, suggested hypotheses were studied and analyzed. It is possible to make a significant improvement in planning and productivity increase in organization by providing fundamental solutions such as utilization of Strategic Information Systems with integration approach and targeted management of work processes.

Keywords: Information Systems, Information Technology, strategic planning, Strategic Information Systems

Introduction

Fast transformations in modern workplaces have transformed Information Technology and Information Systems into main organization elements for achieving goals. Information Systems and Information Technology are considered as an essential factor and their roles are undeniable in modern organizations. Accelerated competitive procedures in the setting have transformed information into vital element of organizations and accurate, appropriate, high-quality and timely

information has become main basics of management decisions in operational, executive and strategic levels. Contrasts in organizations are consequences of created contrast because of creative, divergent and intuitive approach to strategic issues. Strategic Information Systems are recently noticed and have had undeniable influence on all activities of organization. In some organizations Information Technology units don't have official documentations which determine business goals. Business goals aren't compiled by participatory methods and mostly processes required for Information Technology unit are incorrect and ambiguous. In fact, Strategic Information Systems are those Information Systems which form and support position, goals and strategies of an organization. This system can use Information Technology in order to improve relations with customers and play an important role in simplification of service and staff productivity improvement. On the other hand, Strategic Information Systems look for organization progress methods by means of Information Systems and Information Technology, prepare organization for development, production and services related to Information Technology, provide information in an integrate form which lead to value increasing and supports senior managers in development and implementation of strategies.

Research Literature review

Charles Wiseman believes that Strategic Information Systems is creative utilization of Information Technology for supporting competitive strategies of organization in order to be the same or better than commercial rivals. In another definition, each Information System (manual or digital) that can support competition position of organization or give it competitive advantages can be a Strategic Information System [1].

Totally, operational definition of Strategic Information System is development and improvement of information stream for decision-making process and supporting competitive position of organization and its goals.

For recognition of appropriate Strategic Information Systems there are two important methods. One of the methods begins with recognized situations that their improvement has strategic advantage. Decision-making about one strategy and then supporting Information Technology is suitable. This is a reactive method and it is basically adopted by one of the famous international enterprises named as Rosenbluth. Second method begins with available technologies of Information Technology such as Electronic Data Interchange with preparation of electronic copy and then it attempts to compare technologies with present or suggested business models. This is a proactive approach. In each case, a SWOT analysis (Strengths, Weaknesses, Opportunities and Threats) is possibly appropriate.

Strategic Information Systems (SIS) help organization to achieve its strategic goals, increase productivity and productions and creates competitive advantage by means of relevant tools [2].

In fact, strategy indicates "pathway and orientation of organizations". Strategy theory includes topics that are related to main considerations of senior managers or any other person whom looks for success or failure reasons of organizations and competition is the main topic.

Competitive advantage requires distinction in orientation towards the rival and distinction in orientation needs different and new attitudes. One competitive advantage can increase market share, attract new customers, increase customers' loyalty, decrease product costs or supporting services and totally improves competitive situation of an organization in its market [3].

In modern competitive situations, it's very hard to control an organization without Strategic Information Systems. So, organizations can act successfully when they manage inside and outside information stream, correctly. Fast transformations of organizational setting and processes have made it necessary to study Information Systems and Information Technology and their role which are considered in form of Strategic Information Systems. Most of the organizations attempt to imagine their future by means of strategic planning [4].

One appropriate framework and guidance is necessary for design and implementation of flexible Strategic Information Systems which have maximum compatibility with mentioned situations because of importance of organizations' flexibility towards external pressures such as changes of business nature, missions, organizational structures and technology. So, recognition and studying of essential factors and situations in implementation and utilization of Strategic Information Systems can lead to better use of resources and opportunities and to prevent from their loss.

According to transformation of dynamic and variable situations and factors, it is important to compile strategy and plans for Information Systems and Information Technology in order to achieve and support strategic goals and if this process is not planned well in organization, this can cause many problems. This process is based on accurate information of business setting, modern technologies, previous strategies and developing plans of organization.

For designing a Strategic Information System, it is important to understand and recognize activities that should be supported with this system, expectations of users and also information strategy of organization. As an example, it is possible to use analysis of finding structure for recognition and understanding of strategic information. Expectations of potential users of system (individuals whom use or preserve the system) should be collected by means of numerous meetings for specification of expected duties and operations. This activity can be done at the beginning of designing or during preservation process of Strategic Information System [5].

One total structure of Strategic Information System is obtained by means of requirements. It is possible that some information systems can prepare the possibility of correct, complete and timely save and access to information by means of their duties but it is attempted to design Strategic Information Systems such as development and combination of a wider structure of these systems for organization [6].

Amongst this, recognition process of opportunities for utilization of Strategic Information Systems is one of the most important sections of using these systems that are mentioned briefly below.

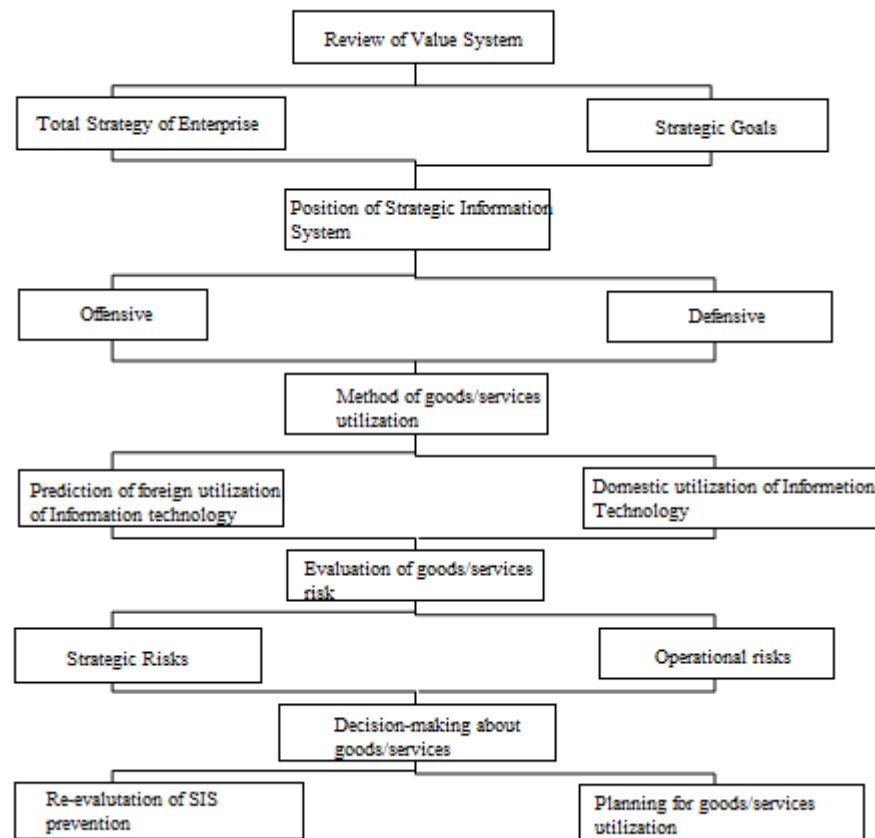


Figure 1-Recognition process of opportunities for utilization of Strategic Information Systems (SIS)

Preliminary step in this process is reviewing and studying value system of organization. During this step, organizational unit responsible for this process (such as special committee, consultant), studies all critical cases in primary activities and support of organization's value chain, value chains of customers, suppliers and rivals. Results of this study prepare findings, ideas and necessary interpretations for steps 1 and 2. Steps 1 and 2 are taken simultaneously along with some feedbacks between them. In these steps, strategic goals and organization strategies supported by Information Technology are focused which can be utilized for affecting and facing with goals. This process should have possible list of strategic goals. By means of this list, organization is capable of choosing goals which are appropriate for attacking (or defending) with strategies supported by Information Technology. This strategy includes guidance according to cost, difference, focus, growth, commitment, innovation and etc. Whenever one strategy which pays attention to one goal is selected, step 3 studies position and situation of Strategic Information System. This strategy can defensively be used for reducing a competitive aspect of one goal or offensively increase another competitive aspect. In step 4, whether Strategic Information System is offensive or defensive, utilization of Information Technology is internal or external. Selected strategic Information System can internally reduce development and production cost by means of relevant technologies (such as CAD/CAM). Step 5 is related to evaluation of operational and strategic risks. Operational risks are

evaluated by focusing on selected Strategic Information System and organization familiarization with relevant Information Technology. Strategic Information Systems always utilize modern ideas and capitals and internal and external resources play important role. These systems require information of internal resources such as task units inside the organization and also need information of resources from out of organization [7]. It is possible to determine appropriate information resources for Strategic Information Systems to utilize task information systems inside the organization and Strategic Information Systems and their comparison with capability of existed systems according to information requirements. Also, by comparing capabilities of existed information systems with information and technology strategies in market, it is possible to choose solutions for selecting hardware and software [8].

Research Conceptual Model

The main and fundamental goal of this research is studying essential conditions for utilization of Strategic Information Systems (SIS) which is stated according to numerous literature and frameworks that are offered in this case. In addition to recognition of necessary conditions and factors in design and utilization of Strategic Information Systems, existed situation of Information Technology/Information Systems are studied for utilization of Strategic Information Systems due to these factors in case study. Information Technology and Information Systems in an organization is necessary but it isn't sufficient; so, recognition and familiarization of organization managers with advantages of Information Technology/Information Systems lead to better utilization of organization opportunities, environmental threats, strengths and weaknesses by means of Information Technology/Information Systems. These are objectives and suggested model of this research.

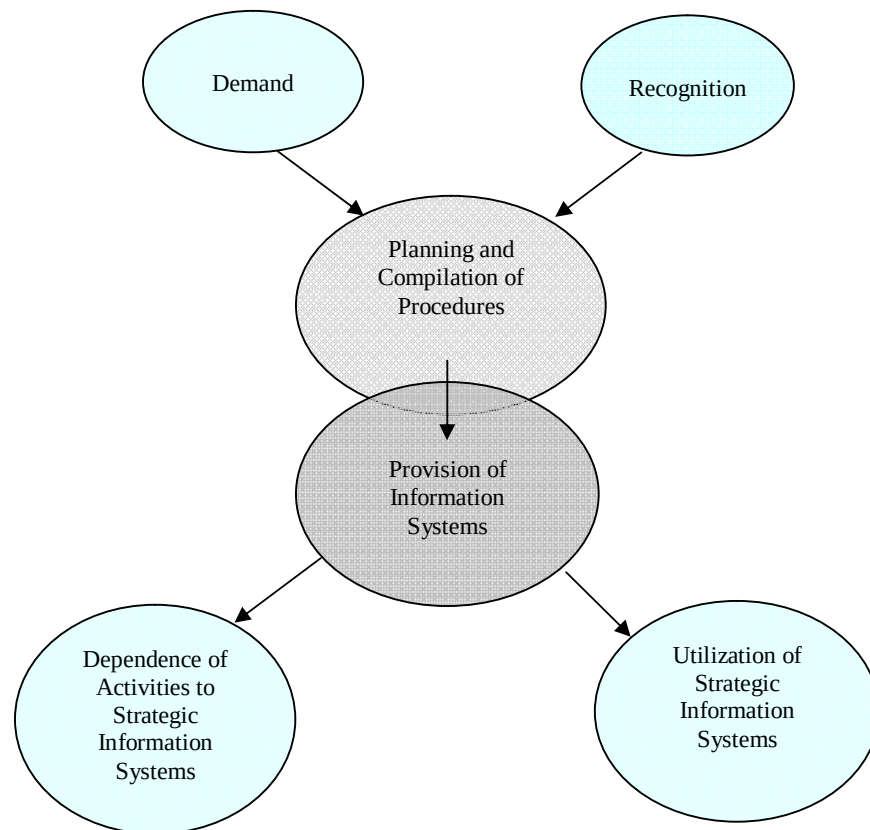


Figure 2- Research Conceptual Model

As it is observed in conceptual model, total and important factors are given in selection and utilization of Strategic Information Systems. From top to the bottom, diagram has begun from recognition and demand to planning and provision of required system. According to relations and dependences of system and its parts, we study its use in organization and analysis of relevant feedbacks for structure reformation. This model is offered totally and fundamental variables of system are given in this research in order to be analyzed and studied by means of statistical analysis in relevant organization.

Research Variables

- recognition of managers in organization (case study) from advantages of Information Technology/ Information Systems for utilization of Strategic Information Systems
- Utilization of Information Technology/Information Systems capacities for implementation of Strategic Information System.
- Importance and dependence of organization activities on Information Technology/Information Systems for utilization of SIS.
- Compiled plans and determined procedures in organization for development and creation of SIS.

Research Goals

Fundamental goals of this research are given below:

- Study of necessary factors and conditions for utilization of Strategic Information Systems.
- Provision of appropriate solutions for utilization and implementation of Strategic Information Systems.

Research Hypotheses

According to objectives, these hypotheses are considered in order to be studied and analyzed:

- First Hypothesis: Recognition of organization managers from advantages of Information Technology/ Information Systems for utilization of Strategic Information Systems is low.
- Second Hypothesis: Information Technology/Information Systems capacity is used a little for utilization of Strategic Information System.
- Third Hypothesis: Importance and dependence of organization activities on Information Technology/Information systems is low for utilization of SIS.
- Fourth Hypothesis: There are few compiled plans and determined procedures in organization for development and creation of SIS.

Research Methodology

This research is applicable by its goal and is descriptive by its method. It is a survey and field research. Statistical population is one of the public and state organizations of Iran (Municipality of Mashad). From all managers, 50 of them were selected and questionnaire was sent for them.

For measuring reliability of questionnaire software SPSS was used. In this case, Cronbach's alpha was also calculated more than 95% which is acceptable for reliability of questionnaire.

In this research, statistical population including managers of Mashad Municipality was interviewed and questionnaire was distributed among them, then results were analyzed by statistical techniques (*t*-student test).

In table below information related to population and their education is given:

Table 1-Distribution of individuals according to education

Education	Frequency	Frequency Percentage	Cumulative Percentage
Diploma	1	2%	2%
Foundation degree	1	2%	4%
Bachelor	34	68%	72%
Higher than bachelor	14	28%	100%
Total	50	100%	

As it is observed 68% of respondents have bachelor degree and 28% of them have higher degree.

Research Findings

Results of First Hypothesis Study

Table 2- calculations related to first Hypothesis

Null Hypothesis	Indexes of Proportion Estimation		Statistics Z	P-Value
	Observed Frequency	In relation to the total frequency		
Rejected	38	%76%	3.68	0.000
Not Rejected	12	24%		

According to test equation $t \approx \frac{\bar{p} - p}{\sqrt{pq/n}}$, test statistics is $\bar{p} = \frac{X}{n}$. After calculation of parameters, the result is given below:

$$t \approx \frac{0.76 - 0.5}{\sqrt{\frac{0.5 \times 0.5}{50}}} = 3.68$$

Probability value (P-Value) can be calculated due to value above which equals with 0.000. As a result, because calculated probability value is lower than test significance, it can be concluded that null hypothesis or this statement “recognition of municipality managers from advantages of Information Technology/ Information Systems for utilization of Strategic Information Systems, is great” is rejected in 5% significance. So, with 95% confidence it can be concluded that: “Recognition of municipality managers from advantages of Information Technology/ Information Systems for utilization of Strategic Information Systems is low.”

Results of Second Hypothesis Study

Table 3- calculations related to second Hypothesis

Null Hypothesis	Indexes of Proportion Estimation		Statistics Z	P-Value
	Observed Frequency	In relation to the total frequency		
Rejected	45	90%	5.66	0.000
Not Rejected	5	10%		

According to given equations, Probability value (P-Value) equals with 0.000. As a result, because calculated probability value is lower than test significance, it can be concluded that null hypothesis or this statement “Information Technology/Information Systems capacity is highly used for

utilization of Strategic Information System” is rejected in 5% significance. So, with 95% confidence it can be concluded that:

“Information Technology/Information Systems capacity is used a little for utilization of Strategic Information System.”

Results of Third Hypothesis Study

Table 4- calculations related to third Hypothesis

Null Hypothesis	Indexes of Proportion Estimation		Statistics Z	P-Value
	Observed Frequency	In relation to the total frequency		
Rejected	37	74%	5.66	0.000
Not Rejected	13	26%		

According to given equations, Probability value (P-Value) equals with 0.000. As a result, because calculated probability value is lower than test significance, it can be concluded that null hypothesis or this statement “importance and dependence of organization activities on Information Technology/Information systems is great for utilization SIS” is rejected in 5% significance. So, with 95% confidence it can be concluded that:

“Importance and dependence of organization activities on Information Technology/Information systems is low for utilization of SIS.”

Results of Fourth Hypothesis Study

Table 5- calculations related to fourth Hypothesis

Null Hypothesis	Indexes of Proportion Estimation		Statistics Z	P-Value
	Observed Frequency	In relation to the total frequency		
Rejected	41	82%	4.53	0.000
Not Rejected	9	18%		

According to given equations, Probability value (P-Value) equals with 0.000. As a result, because calculated probability value is lower than test significance, it can be concluded that null hypothesis or this statement “there are many compiled plans and determined procedures in organization for development and creation of SIS” is rejected in 5% significance. So, with 95% confidence it can be concluded that:

“There are few compiled plans and determined procedures in organization for development and creation of SIS.”

Conclusion

In organizations information is important as a resource. This information is produced and distributed as Information Systems and it is essential to have a guided strategy for this. So, planning and compilation of procedures is important in organization. First, situations are evaluated, requirements are recognized accurately, and then individuals are utilized in each section according to appropriate methods and techniques. This type of planning make managers interested in organization, and indicates environmental changes to organization. It cause coordination and understanding in organization and reinforces far-sightedness in managers which show opportunities ahead. These advantages create some frameworks for implementation of planning and control of processes which is an introduction of providing one appropriate Strategic Information System and consequently there will be achievements from implementation of such system.

According to these explanations about establishment and implementation of Strategic Information Systems and as studied organization has service identity not economic, it seems that one fundamental framework should be selected, processes and services of this system must be studied for implementation of Strategic Information Systems in organization. The best system is Porter's five forces.

Recognition of processing opportunities of organization is the second framework which should be studied. Recognition of environment related to organization services and affairs guide us to identify opportunities. As studied organization doesn't have one value chain or one system for recognition of Strengths, Weaknesses, Opportunities and Threats (SWOT), so it is useful to utilize Customer Resource Life Cycle (CRLC) in this field. This model can help managers to understand special opportunities of organization for Information Technology, as an analytic tool. High productivity will be assigned to this model when value framework is determined for it. This is the third step for implementation of Strategic Information Systems.

One of the methods for determination of value framework is imagination of business technology situation or technology effect model. In complicated establishment of Strategic Information Systems, absolutely there will be some factors that affect success or failure of system establishment. In order to get ready for facing with such cases, fourth step which is frameworks of probable factors should be considered. Critical Success Factors method is the most appropriate way.

In total study it is observed that lack of Strategic Information Systems in case study causes numerous problems which cannot be solved by sectional plans and solutions. They only increase costs and will lose their efficiency after long time because related sections don't expand and develop coherently and management cannot act integrated and targeted. So, for solving these problems, productivity increase and staff and customers satisfaction is expected by utilization of offered solutions and selection of appropriate system which is compatible with organization.

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