Indian Journal of Fundamental and Applied Life Sciences ISSN: 2231– 6345 (Online)
An Open Access, Online International Journal Available at http:// http://www.cibtech.org/sp.ed/jls/2014/01/jls.htm
2014 Vol. 4 (S1) April-June, pp. 1385-1392/Abedini and Darmy
Research Article

MEECHASUREMENT AND ANALYSIS OF TECHNOLOGY INNOVATION CAPABILITY AT SABERAN CO

[*]Mahdieh Abedini[1], Hadi Darmy[2]
[1] *Department of Management and Economy, Islamic Azad University of Science and Research of Tehran, Iran*
[2] *Department of Management, University of Tehran, Iran*
**Author for Correspondence*

ABSTRACT
An important factor in the failure of technology adoption to achieve competitive advantage in companies is the lack of awareness of company technology capability and not being able to apply that to the benefit of company objectives. Assessment of technology needs and capabilities can help firms achieve their strategic goals. Research shows that nowadays many firms are not aware of their own technology capabilities in a realistic and exact manner. Evaluating technology needs not only identifies weak or problematic areas but also recognizes company's strengths and advantages. This paper assesses the technology innovation capabilities at Saberan Co. It also provides a solution to reduce the gap from the as-is to the to-be state. To this end, it uses a technology needs assessment model to evaluate this company. The model Includes 9 indicators and 24 questions which assess the level of the firm's technology capability. Each of these indicators indicate the firm's status in one of the areas under investigation and presents suggestions to reduce the existing gap in the respective area.

Keywords*: Technology, Technology Assessment, Technology Capabilities*

INTRODUCTION
Today the success of government, various industries, private or public companies and every person in societydepends on how they utilize technology. Growth in different sciences creates pressure to develop more advanced technology. So basic ideas turn to technology innovation and then these ideas turn to new goods and services. As a result top level policy makers consider the management of technology to be a strategic factor.
At industry level, c-level managers believe upgrading technology improves efficiency and effectiveness. At economic firm level technology is considered to be the main basis of business and the production of goods and services. As a result economic managers put in a great effort to achieve the goal aforementioned. Apart from what level of technology is applied or should be applied, competitiveness and the rapid change of technology have played an important role in the formation and evolution of technology management (Dorri, 2012).
An important factor in the failure of technology adoption to achieve competitive advantage in companies is the lack of awareness of company technology capability and not being able to apply that to the benefit of company objectives.
Technology and its application in the design and production of goods and services is one of the most important issues to the managers of SABERAN Company in order to keep and develop their markets.
Nowadays the planning and development of technology programs are discussed widely and in all programs provided, firm technology capability assessment is one of the most important steps.

LITERATURE REVIEW
Technology assessment is a tool designed to identify capabilities needed to achieve technology priorities in developing countries (Ahmadi, 1982).
Assessment of technology capability level is a tool used to specify needed capabilities and to implement technology priorities. In technology capability assessment not only attention is paid to the investigation of firm's technology problems but also attempt is made to identify strengths and advantages (Esbati, 2006).

© Copyright 2014 | Centre for Info Bio Technology (CIBTech)

Today organizations have to resort to technology change and the creation of advanced technology in order to stay competitive. But this question arises: "what is the best way to close the gap in technology in the course of technology acquisition and adoption?" (JafarNejad, 2005).

It seems that technology capability models are the appropriate means to confirm these mental estimates. Experience shows that models and methods used in companies should have two basic characteristics. First they must be simple and easy to understand. And secondly they must be effective in a quite short period of time (Tabatabaeian, 2005).

There are various models related to technology capability assessment which are categorized into three groups as follows in Table 1.

Table 1: models related to technology capability assessment

Solution for Compensation gap technological model	Assessment Causes of the technological gap models	Models of determine the technological gap
Ford Model	Ford Model	Atlantic Technology Model
Lindsay model	Lindsay model	.Porter's model
Fall Model	Atlantic Technology Model	Panda and Ramanatan model
Garcia Arrola model	Floyd Model	Floyd Model
Lane model	Management Technology requirement model	Management Technology requirement model
Assessment Technology requirement model	Levels of technological capabilities model	Assessment technology content model
Management information system technology and Knowledge model		Assess the success of technology model
Management Technology requirement model		EVA model

OBJECTIVES AND QUESTIONS OF STUDY

The target of this investigation is to evaluate the firm's Technology capabilities with respect to 9 areas and also to Assess the existing gap to upgrade the firm's technology Capabilities .

Questions of the study are as follows:

1. What is the status of the company with respect to each of the 9 technology innovation capability indicators?
2. What is the company's level in technology capabilities
3. With regard to the company's level of technology capabilities, what is the categorization of the company and what are the characteristics of these companies?

Introducing Usage Model in Research

We applied technology need assessment model in order to Asses firm technology capability. According to this model the firm’s ability is measured with Respect to nine indicators based on a questionnaire including 24 questions.

© Copyright 2014 | Centre for Info Bio Technology (CIBTech)

Figure1: Categories of IT capabilities based on technology needs model

Awareness capability: this capability indicates the firm's awareness of its needs to improve technology.
Search capability: the search capability indicates the firm's ability to identify its technology threats and opportunities.
Competency capability: the competency capability indicates the firm's capability in creating core competencies to distinguish it among its competitors.
Technology strategy capability: this capability indicates the firm's capability in developing suitable strategy to support its business.
Technology assessment capability: this capability indicates the firm's capability in evaluating and selection of a suitable technology solution.
Technology acquisition capability: this capability indicates the firm's capability in the acquisition and application of technology.
Learning capability: this capability indicates the firm's capability in learning lessons from previous experience to improve its technology and to offer new products.
The capability of utilizing external bonds: this indicates the firm's capability in communicating with the supply network and using external bonds with institutions such as universities, research institutions and government incentives.
After the completion of questionnaires by experts, the results are integrated. Then the total result was compared with values in Table 2 which ultimately indicates the firm's capabilities' level. The 5-point Liker scoring was used for the answers.

Table 2: Determine technology needs assessment results

Classification of companies	The ability	Total score
Passive	1	**1-30**
Reaction	2	**31-60**
Strategic	3	**61-90**
Creative	4	**91-120**

According to this model and the categorization in Table 2, firms are divided into 4 types:
1. Passive firm: this type is not well aware of its needs for technology transferor or environmental improvements and it also doesn't know which of its technology capabilities needs to be upgraded. So such a firm cannot enjoy a stable policy in a critical and fast-changing environment.

© Copyright 2014 | Centre for Info Bio Technology (CIBTech)

2. Reactive firm: this type recognizes the necessity of technology capabilities improvement in order to achieve objectives of growth and development but it only reacts to external threats and due to the scarcity of its internal resources (lack of core competencies and individual experiences), it is not able to utilize conditions to its advantage.
3. Strategic firm: this type is well aware of how to upgrade its technology capabilities, enjoy a strategic perspective and has high ability in implementing projects.
4. Creative firm: most of these companies like Microsoft, Ford, etc. earn high income and act swiftly in improving technology capabilities.

INTRODUCING RESEARCH INDICATORS

Figure 2 shows the categorization of technology capability dimensions based on technology needs model. Connection between indicators and dimensions used in the study is shown in figure 2. These indicators are used in designing the questionnaire in order to collect information for research questions.

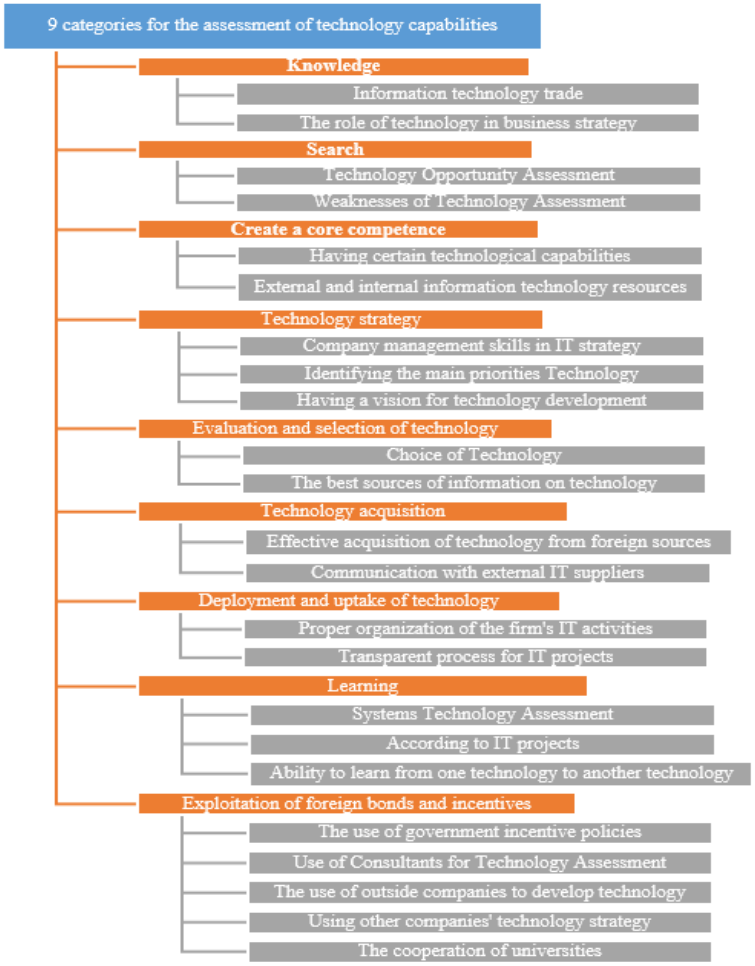


Figure2: Categories of IT capabilities based on technology needs model

Statistical population

Statistical population used in research consists of 33 people, including managers and experts.
Additionally due to the limited number of the population items, we use the method of enumeration of the whole population.
Figure 3 shows the distribution of the population by education certificate.

© Copyright 2014 | Centre for Info Bio Technology (CIBTech)

Table 3: The population abundance based on qualification

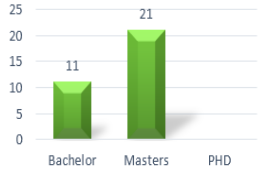
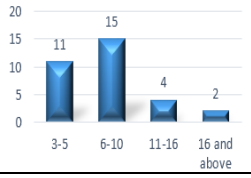
	% Of Total	The Number	Education
	65.62%	21	Masters
	34.37%	11	Bachelor

Table 4 also shows the frequency of statistical society based on work experience.

Table 4: The population abundance based on experience

	% Of Total	The number	Experience
	34.37%	11	3-5
	46.87%	15	6-10
	12.5%	4	11-16
	6.25%	2	16 and above

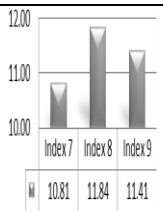
Results of Question 1

Table 5 shows scores for each of the nine dimensions of the research with respect to questionnaire completed by the experts.

Results of Question 2

By summarizing results from the questionnaire, the capability level of each of the nine dimensions based on aggregating the indicators, results was acquired according to Table 6. Also the level of company technology capabilities was obtained as 54.87%.

Table 5: 9 categories for the assessment of technology capabilities

Graph of average index	Rating Index (%)	Index's	Index	Dimension
	%61.41	Information technology trade	1	Knowledge
	%62.66	The role of technology in business strategy	2	
	%58.75	Technology Opportunity Assessment	3	Search
	%49.53	Weaknesses of Technology Assessment	4	
	%55.31	Having certain technological capabilities	5	Create a core competence
	%59.84	External and internal information technology resources	6	
	%54.06	Company management skills in IT strategy	7	Technology strategy
	%59.22	Identifying the main priorities Technology	8	
	%57.03	Having a vision for technology development	9	

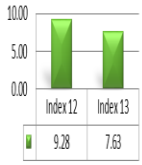
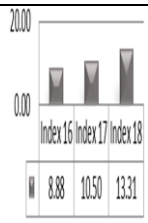
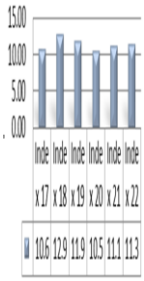
	%52.66	Choice of Technology	10	Evaluation and selection of technology
	%58.91	The best sources of information on technology	11	
	%46.42	Effective acquisition of technology from foreign sources	12	Technology acquisition
	%38.13	Communication with external IT suppliers	13	
	%51.41	Proper organization of the firm's IT activities	14	Deployment and uptake of technology
	%45.00	Transparent process for IT projects	15	
	%44.38	Systems Technology Assessment	16	Learning
	%52.50	According to IT projects	17	
	%66.56	Ability to learn from one technology to another technology	18	
	%53.44	The use of government incentive policies	19	Exploitation of foreign bonds and incentives
	%64.53	Use of Consultants for Technology Assessment	20	
	%59.84	The use of outside companies to develop technology	21	
	%52.81	Using other companies' technology strategy	22	
	%55.63	The cooperation of universities	23	
	%56.88	The use of cooperative state research centres	24	

Table 6: Average percentage level of ability Technology ability

Percentage of average ability	Number of index	Dimension
%62.03	2	**Knowledge**
%54.14	2	**Search**
%57.58	2	**Create a core competence**
%56.77	3	**Technology strategy**
%55.78	2	**Evaluation and selection of technology**
%42.27	2	**Technology acquisition**
%48.20	2	**Deployment and uptake of technology**
%54.48	3	**Learning**
%57.19	6	**Exploitation of foreign bonds and incentives**
%54.87	24	**Total**

© Copyright 2014 | Centre for Info Bio Technology (CIBTech)

Results of Question 3

The total average of scores from the 24-question questionnaire was 54.87 which according to Table 2 and Figure 1 showing the positioning of firm technology capabilities, the company under study is ranked among the reactive firms or a firm of type B

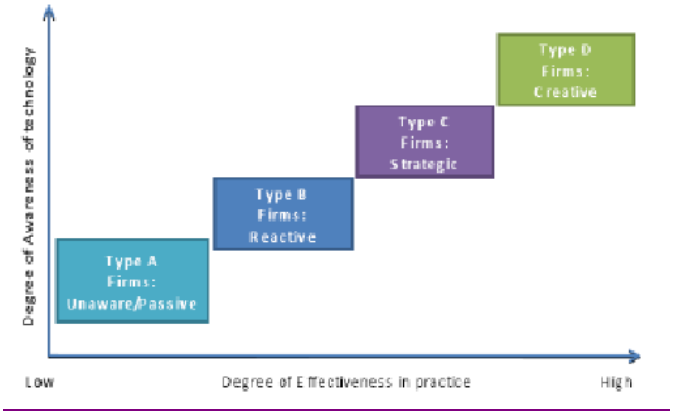


Chart 1: It is ability of charts position

RESULTS ANALYSIS

The company technology capability level was classified as type B. Companies of Type B (reactive companies) are companies which recognize the necessity of improvement in technology capabilities to acquire growth and development objectives but due to scarcity of resources (core competencies and individual experience) only react to environmental threats and are not able to take advantage of situations.

Finally one of the main objectives of the company for a successful presence in competition is to move toward becoming a strategic firm. Strategic firms are well aware of how to upgrade their technology capabilities, enjoy a strategic perspective and have great ability in implementing their projects.

On the other hand, there is a gap between company technology capability (a score of 100%) and the as-is situation which is shown in Table 7 and Figure 2.

Table 7: Available in different sizes with a good level of IT ability gap

Gap	Rating Average Abilities	Dimension
37.97%	62.03%	**Knowledge**
45.86%	54.14%	**Search**
42.42%	57.58%	**Create a core competence**
43.23%	56.77%	**Technology strategy**
44.22%	55.78%	**Evaluation and selection of technology**
57.73%	42.27%	**Technology acquisition**
51.8%	48.20%	**Deployment and uptake of technology**
45.52%	54.48%	**Learning**
42.81%	57.19%	**Exploitation of foreign bonds and incentives**
45.72%	54.27%	**Total**

© Copyright 2014 | Centre for Info Bio Technology (CIBTech)

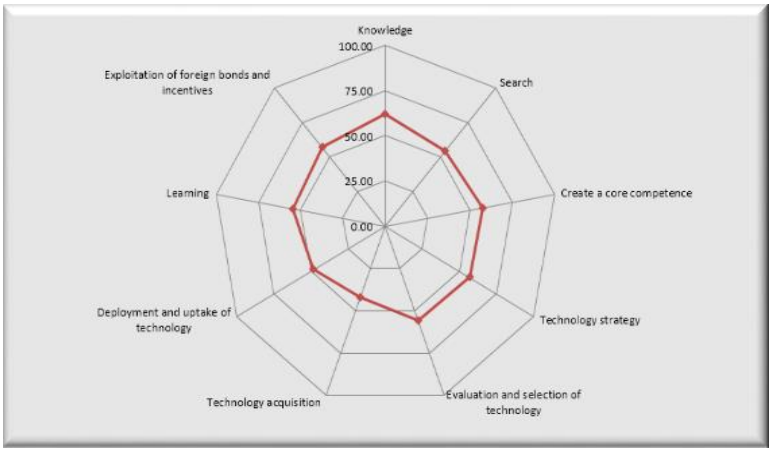


Figure 2: charts of technology ability in different dimensions

According to Table 7 and Figure 2, it is observed that total company technology capability differs from the desired status by 42.72%. Also it is seen that maximum gap belongs to the acquisition dimension and the minimum gap belongs to the awareness dimension so the c-level managers should take action to bridge the existing gap in technology by proper planning and the definition of improvement projects.

REFERENCES

Abbas Khamse. 2013, Technological capability assesment of defense industries
Bana, David, 2009, "What is technology assessment?", University of Maastricht
Dori. A, 2013, "Executive Management Master's Thesis", University of Tehran Science and Research
Esbati. hoseen. 2008, Strategy of Technology ,in Persian
Fadavi ASGARI .Arefe, 2005, TechnologyTransfer Paper
H.Guston, David, 2002, "Real-Time technology assessment", Technology in society 24
InnoSupportTransfer – Supporting Innovations in SME, http://www.innosupport.net/index.php?id=92&L=&tx_ttnews%5Btt_news%5D=73&tx_ttnews%5BbackPid%5D=74&cHash=b14221c8b7
InnoSupportTransfer-Supporting Innovation in SME,2007, http://www.innosupport.net
Jafarnejad. Ahmed. 2007, "Audits of technology and technology solutions for decreasing gaps", Journal of Management Sciences in Iran, Volume I, Number 2
Khalil.Tareg, 2003, Management Of Technology, Translation Of Kamran Bageri.
NASA, 2012, "Technology Assessment"
Rnasy, F, 2011, "Assessment of technology in small and medium enterprises", Industrial Management
Tabatabaeean. Seyed Habibolah, 2006, Technology Capability Assessment in Firm Level.
Unido, 2002, Technology Need Assessment for developing countries,www.unido.org

© Copyright 2014 | Centre for Info Bio Technology (CIBTech)