ASSESSMENT OF TECHNOLOGICAL CAPABILITIES IN CASTING INDUSTRY CASE STUDY: BEHREEZFOOLADAN COMPANY)

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ABSTRACT

In our world, today, with the increasing of Technology level and necessary to use new technologies, need to assessment technology is felt more than ever. This research responds to the all technology-driven needs focused on how can an organization can find new opportunities on the base of technical capabilities, and also it suggests that roadmap of technology begins with the assessment of technology capabilities and ends with the business opportunities for analyzing market plan. Analyzing of technology needs is a tool to determine necessary capabilities for applying technological priorities. Analyzing of these needs not only reveals the weaknesses of the considered company, but also pays attention to its relative advantages and specifies them. This model assessments the capabilities of the organization on the base of 9 dimensions in which of them, it determines the position of the company and at last, it provides the present gap.

Keywords: Technology, Technology Assessment, Technology Capability

INTRODUCTION

Companies' success in different industries, private and public companies depends directly on the way they use and utilize related technologies to that company and business. Expanding of various sciences provides pressure to develop different technologies, so that initial plans and ideas provide technological innovations and finally these ideas and plans change into new products and services. For this reason, decision makers of high levels of politics show a lot of interest from the point of view that it causes improvement in technology level and as a result causes increasing efficiency and effectiveness in related industry (Dori, 2012).

Today, technology is a protector of competitive advantage of countries and is a factor in industry progress and economical development and technology assessment is increasingly considered as an important tool in technology change and development (Chen lo, 2010).

In last decades, it has been seen that market is changing quickly and developing of new tools in technology has been seemingly unlimited and the result of this developments that the life cycle of the product has become too short (Sangjoo lee, 2009).

Experiment shows that models and methods applied in a company should have two essential features: first, it should be simple and intelligible, and second it should leads to the desired conclusion in a short and acceptable time. On the other hand, technology assessment is one of the duties of strategic managers in a company who plan necessary strategies and policies, according to the environmental conditions and their capabilities and analyzing of weaknesses, in order to develop the company and fulfill of goals (Tabatabayian, 2006).

Review of literature:

Assessment of technology capabilities: assessment of technology capabilities is a process in which the current level of technology capabilities of the company is measured to both determine the week and strength points and to compare the technology levels of the company with rivals on the base of ideal level in order to compensate undesirable cases (Tabatabayian, 2006).

Technology: technology is all the knowledge, products, tools, methods and systems which are used to provide a product or service, it is the process of transfering and changing sources to the products via

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knowledge, experiment, information and tools (Khalil, 2003). Technology assessment is a framework and tool, which is used to determine necessary capabilities for applying technology priorities designed in developing countries. Companies should inevitabley go toward technology assessment and providing advanced technologies, but here this question rises that in the way of reaching technology, what is the best method to decrease technology gap? (Jafarnejad, 2007).

Categorization of different models in technology capabilities: there are different models in relation to the technology capabilities assessment, which are categorized in three general parts according to Table 1.

Table 1: Categorization of models in Technology capabilities assessment (Khamseh, 2014)

Models of determining Technology Gaps	Models of assessing the causes of these gaps	Models of providing solutions to remove these gaps
Model of Atlas Technology Model of Porter Model of Panda and Ramantan Model of Fluid Model of Technology needs management Model of Technology content assessment Model of Technology position assessment Model of economic value-added	Model of Ford Model of Lindsay Model of Atlas Technology Model of Fluid Model of Technology needs management Model of Technology capability levels	Model of Ford Model of Lindsay Model of Fal Model of Garcia-Arreola Model of Lin Model of Technology need assessment Model of science and Technology management information systems Model of Technology needs management

Research purposes and questions:

Purposes of this research are to determine the capabilities rate, 9 dimensions of Technology capabilities and also determine the amount of current gap, in order to improve technology capability level of the company.

Research questions are as follow:
1- Which level is each of these 9-folded capabilities?
2- What are the technology capabilities of the company?
3- According to the Technology capability levels, a company is classified as what kind of companies?

Introducing the model used in the research:

This research uses the model of Technology needs assessment in order to Technology capabilities assessment of the company. According to this model, company capabilities are measured from 9 dimension and on the base of a 24 questions questionnaire.

9 classifications for Technology capability assessment:
-   Consciousness
-   Search
-   Providing a merit-based condition
-   Technology Strategy
-   Technology assessment and selection
-   Technology Acquisition
-   Technology applyment and attraction
-   Learning
-   Utilization of external links and encouragers

Classification of these capabilities is in accordance to figure 1.

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By consciousness, we mean company capability and knowledge in recognizing needs to improve technology.

By search, we mean company capability in recognizing technology opportunities and threats.

By providing a merit-based condition, we mean company capabilities in providing a merit-based condition.

By technology Strategy, we mean company capabilities in developing a suitable strategy for protecting business.

By technology assessment and selection, we mean company capability in assessing and selecting a suitable technology approach.

By technology applment and attraction, we mean company capability in reaching and applying a technology.

By learning, we mean company capability in learning from previous experiments to improve technology and new products.

By utilization of external links and encouragers, we mean company capability in providing connection with supply network, and utilizing external links (university, governmental encouragers.(….

After completing the questionnaire by the experts, the scores are compared based on Table 2.

Table 2: Results determination form of technology needs assessment

Overall audit results	Sum of scores	Capability level	Companies classification	Partial ranking	
Your company in all main areas of technology reaching, acquisition, development, and strategy is inefficient and weak, and needs and immidiate and general improving plan	1-120	1	Passive (A)	1-40	beginner
				41-80	Moderate
				81-120	pioneer
Your company has developed week in most areas of technology Strategy, search, acquisition and capacity making and needs several capabilities to rebuild these areas	121-240	2	Reactive (B)	121-160	beginner
				161-200	Moderate
				201-240	pioneer
Your company, in internal capabilities, is relatively capable and has a strategic approach toward technology but in most areas is very latter from national technology	241-360	3	Strategic (C)	241-280	beginner
				281-320	Moderate
				321-360	pioneer
Your company has a series of completely developed technology capabilities and can recognize the border of national technology. It has also an innovative approach in many areas and uses technology in order to reach to competitive advantages	361-480	4	Innovative (D)	361-400	beginner
				401-440	Moderate
				441-480	pioneer

Statistical society: statistical society involves senior managers and experts. The calculations of this society have been done according to the total numbering method, since the number of experts was too few. Capabilities of this company include producing kinds of brasion resistant casting parts, according to the international valid standards, producing kinds of parts, made out of fireproof steel for cement and steel factories and mines, producing kinds of parts, made out of stainless steel and producing kinds of carbon and low alloy steels to be used in automobile industry, Hydrocarbon instruments, Locomotive engine and … .

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Table 3: Capability level of technology 9-folded dimensions

Dimensions	index	indicators	Indicators scores
Concsiousness	1	Awareness of business technologies	77.5%
	2	The role of technology in trade strategy	68.33%
Search	3	Technology opportunities assessment	67.08%
	4	Technology weaknesses assessment	59.72%
Providing a merit-based condition	5	Having special technology capabilities	66.39%
	6	Awareness of internal and external technology resources	67.22%
Technology strategy	7	Skill of company management in codification of technology strategy	69.86%
	8	Recognizing essential technology priorities of the company	72.08%
	9	Having a proper perspective to develop technology	75.42%
Technology assessment and selection	10	Having technology choice	76.53%
	11	Having knowledge about the best resources of technology	70.28%
Technology acquisition	12	Effective acquisition of technology from external resources	61.11%
	13	Connection with external technology suppliers	62.08%
Technology applymemt and attraction	14	Suitable planning of company technology activities	59.03%
	15	Being transparent of different technology processes	65.69%
Learning	16	Suitable system of technology assessment	64.86%
	17	Considering to the future technology projects	63.47%
	18	Learning capability from one technology to another technology	65.14%
Utilization of external links	19	Using from government couraging policies	46.53%
	20	Using from consultants for technology assessment	63.47%
	21	Using from people out of company for technology development	73.06%
	22	Using from other companies for applying technology strategy	74.58%
	23	Using from universities cooperation	68.61%
	24	Using from government research centers	54.86%

**Table 4: scores average and capability percentage of technology capability levels dimensions**

Dimensions	Number of indicators	Average score of capability percentage
Concsiousness		72.92%
Search		63.40%
Merit-based condition		66.81%
Technology strategy		72.45%
Assessment and selection		73.40%
Technology acquisition		62.60%
Applyment and attraction		62.36%
Learning		64.49%
External links		63.52%
Average of total score		66.77%

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Findings of First research question: Table 3 indicates the percentage of earned scores of each of research 9-folded indicators dimensions based on done poll in statistic society.

Findings of second research question: according to the results of questionnaires in the statistic society, the capabilities rate of each of these 9-folded dimensions in research is reaches based on the indicators and table 4. It should be said the amount of these capabilities is 333.85 (with considering coefficient 5).

Findings of third research question: according to the Table 2, the locating position of technology capabilities of concerned company is in the series of strategic company.
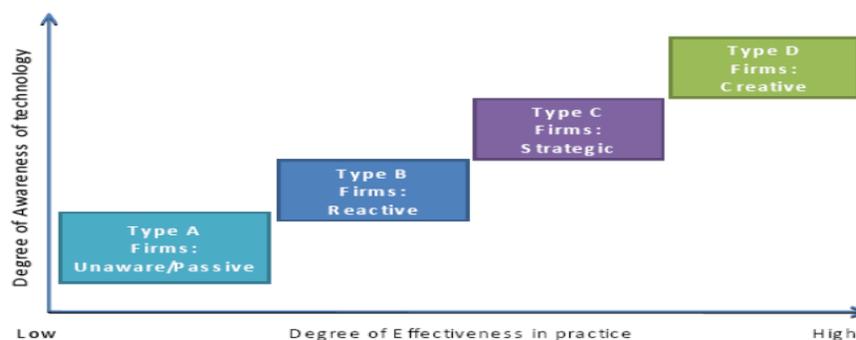

Figure 2: locating position of technology capabilities

CONCLUSION

Technology capability level of the company locates in the series of strategic companies. Strategic companies have a right approach about how they can improve technology capabilities of their companies. They have a high capability in executing their projects and a strategic view toward capability making. Although strategic companies can respond to the technology rules in a quick and effective manner, they need a new approach to increase their innovations, and they may need a more suitable access to the capital goods. Strategic companies utilizes from awareness focused on the latest technologies, which is needed for medium and ling term goals. These companies pass technology borders in related areas and gradually make them ready to move toward an innovative company. There is a gap between desired levels of technology capabilities (100%) and current level, which is shown in the below table and its figure.

Table 5: current gap between different dimensions of technology capabilities and desired level

	Capability percentage	Score average	Current gap
Concsiousness	72.92	14.58	27.08
Search	63.40	12.68	36.6
Merit-based condition	66.81	13.36	33.19
Technology strategy	72.45	14.49	27.55
Assessment and selection	73.40	14.68	26.6
Technology acquisition	61.60	12.32	38.4
Applyment and attraction	62.36	12.47	37.64
Learning	64.49	12.90	35.51
External links	63.52	12.70	36.48
Total Average of capability	**66.77**	**13.35**	**33.23**

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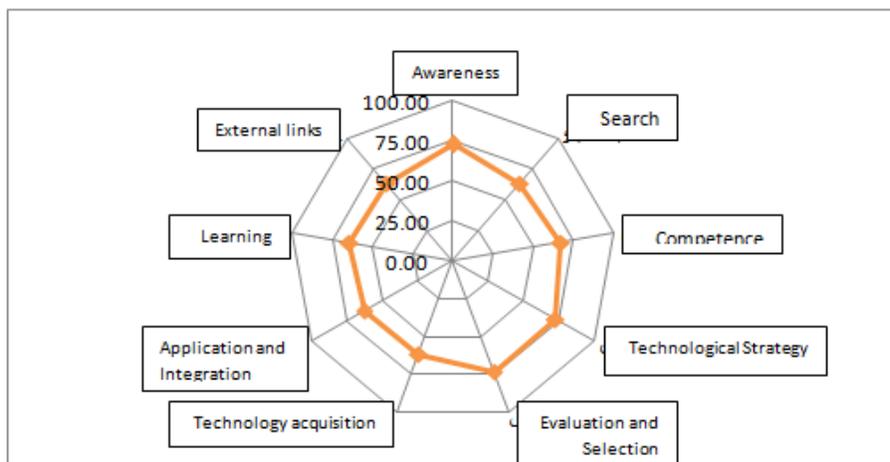
Figure3: the overall figure of technology needs of assessment method

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