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**FORMULATING STRATEGIC TECHNOLOGY AT NADIM GOSTARESH  
PERSIAN GULF SHIPBUILDING COMPANY**

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**ABSTRACT**

Technology plays a prominent and determining role in today's modern world. Utilizing technology have deeply influenced on development and progress of various societies, the purpose of formulating technological strategy is obtaining to technological premium and based on that, it would find possibility of a proper place in the market. Spending huge expenses and creating complicated systems in industrial enterprises indicate the importance of formulating and develop strategic technology.

The research associating this paper has carried out in NadimGoshtaresh Persian Gulf Shipbuilding Company and tries to present a suitable pattern for formulating strategic technology, after investigating various models, finally a proper model based on Hax's model with minor changes has been presented, a model in accordance with current conditions existing in ship building industry.

Determine the mission, view and immense objectives of the organization, identifying key processes, identifying key technologies relevant to the processes, technological attractiveness evaluation and auditing of technological capability and formulation strategic technology are of the main objectives of this research, discussed population of statistical society in the research considered are experts, a series of officials, administrators and managers who, due to lower volume of society samples, a census has been used instead.

In the course of research and after identifying 7 key process, action was key technologies associated with the processes was identified. At this stage, 24 technologies out of others ones were chosen as the key technologies which are used in next steps in order to assess the

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attractiveness of technology and technological audit. Finally after putting each technology in the matrix attractiveness - capability, the company's strategy was formulated.

**Keywords: Strategic technology, the attractiveness of technology, the capability of technology, positioning approach, Hax's model.**

## 1-INTRODUCTION

Every organization shall be obliged to observe applicable planning and program control along its organizational duties and strategies. In the present, there has been an abundant interest in researching and studying the concept of technological developments; various Iranian industries are struggling to obtain update technologies.

This industry has been facing with several problems during past 30 years, in spite of spending immense expenditures and making use of various technologies. Nowadays, shipbuilding industry needs methods which enable it to make use of new available technologies for production. Large projects require relevant technologies in order to obtain its pre-planned objectives.

Nowadays, through technological development and discovering prominent resources in the sea and also economical – political attention to maritime, shipping and sea-transportation as well as being majorly economic to trade and commerce through the sea, many countries laying by sea or having directly access to open-seas have made efforts to establish shipbuilding and

ship-repair industries. According to the noticeable technological development in associated with shipbuilding, this industry has experienced up-and-down. To take full notice of formulating strategic technology as an instrument to gain competitive advantages has less been considered but what has been taken into consideration was business strategic approaches in shipbuilding and less to strategic technology.

On the better word the purpose of the business strategy is to reach and gain stable economy but the purpose of strategic technology is to stable technological advantages which bring certain competitive advantages. In this case what is important to be taken into consideration is to choose a technology among various technologies in accordance with development of capabilities.

## 2- NadimGoshtaresh Persian Gulf Shipbuilding Company

Concerns are following steps briefly:

- Determining scope of work, view and immense objectives of organization.

- Determining strategic objectives compatible to immense objectives of organization.
- Identifying key/strategic process
- Assessment of processes and choosing key processes.
- Identifying key and strategic technologies related to processes.
- Assessment attractiveness and capability of technologies.
- Formulating strategic technology.

NadimGoshtaresh Persian Gulf Shipbuilding Company is considered as one of the most experienced companies in field of construction and repair of vessels in the country, this company has mentioned their participation in regional markets and gaining competitive advantage as one of key strategies in the context of their own formulated strategies. It is very obvious that most of this competitive advantage is resulted by relying on the advantages of technology from strategic technology planning, such an issue has received little attention during the past 30 years.

The main objectives of this research are to provide and formulate strategic technology for NadimGoshtaresh Persian Gulf Shipbuilding Company. According to the objective mentioned above, subsidiary objectives includes identifying strategic processes and strategic technologies, evaluate the attractiveness and capability of

key technologies and finally company's formulating technological strategy.

### **3-Research Methodology:**

#### **3-1-Research model selection:**

Due to the importance of procedural attitude in NadimGoshtaresh Persian Gulf Shipbuilding Company and extensive utilizing process in the logistic and operational divisions, the suggested model shall include following two main characteristics in order to meet the specific requirements of this industry.

1-Planning based on process approach.

2-Strategic technology being in accordance with strategic objectives.

The suggested model shall provide the possibility of identifying and assessment new existing technologies, according to the conducted studies on 5-year strategy of company changes in the markets connected to the industry do not take place quickly, rate of compatibility is low, and so in this model Hax – Majluf considered positioning approach is especially important.

Due to the fact that in this industry, strategic objectives have been over-emphasized by the directing manager of NadimGoshtaresh Persian Gulf Shipbuilding Company, the leading role of objectives cannot be neglected in process of formulating strategic technology. Hax model is more important due to its emphasis on corporate strategy.

Therefore; lack of considering these strategies will decrease the validity of its results. Therefore, in order to select a proper model for formulating technologic development for Nadim Goshtaresh Persian Gulf Shipbuilding Company, after surveying the models considering positioning-based approach we have found Hax – Majluf more proportionate to shipbuilding industry than others. According to the condition ruling this industry, we decided to make some changes in this model.

#### **4-RESEARCH METHODS:**

This kind of research is based on applicable purpose because (a) - The main objective of this research is to formulate strategic technology development in a particular industry (b) the findings of the current research is considered as the base of suggestions and recommendations for a NadimGoshtaresh Persian Gulf Shipbuilding Company

From conducting point of view, this research is descriptive – measuring. It is description because it has been intended to provide a method in order to create more understanding of the present situation and helps in the decision-making process to programmers and policy planners, and it is measuring in order to help using measuring method to determine the deviation of performance.

#### **4-1-Methods of data collection:**

In this research, following methods has been used to collect data:

In term of the theoretical foundations of the research sources and library documents has been used. These resources include books, articles in English and translated into Persian (Farsi) relevant papers.

In order to select a key process and to identify key / strategic technology, check lists in 5-point scale Likert method has been used. To determine the attractiveness and audit capability / capability of key technologies a check lists with 5-point scale Likert method has been used.

#### **4-2-The validity and reliability of measuring instruments:**

It has been practiced to collect information before the meetings and face to face interview with experts and a number of respondents, various aspects and components of the research has been taken into consideration that research parameters and indexes would have to be verified by the experts. Then the questionnaire and therefore content validity was established. On one hand due to the fact that the questionnaire was relying on the contents of features that have been raised in the literature, on the other hand through interaction with experts and examinees it would be corrected and completed. It is understandable that the content validity of

instruments have been considered in this research.

Cronbach's alpha coefficient was used by making use of SPSS statistical software were calculated and for Questions 1, 2, 3, 4

and 5, are 708/0, 841/0, 871/0, 940/0 and 878 / 0, respectively. Therefore, the research questionnaires have got the favorable reliability.

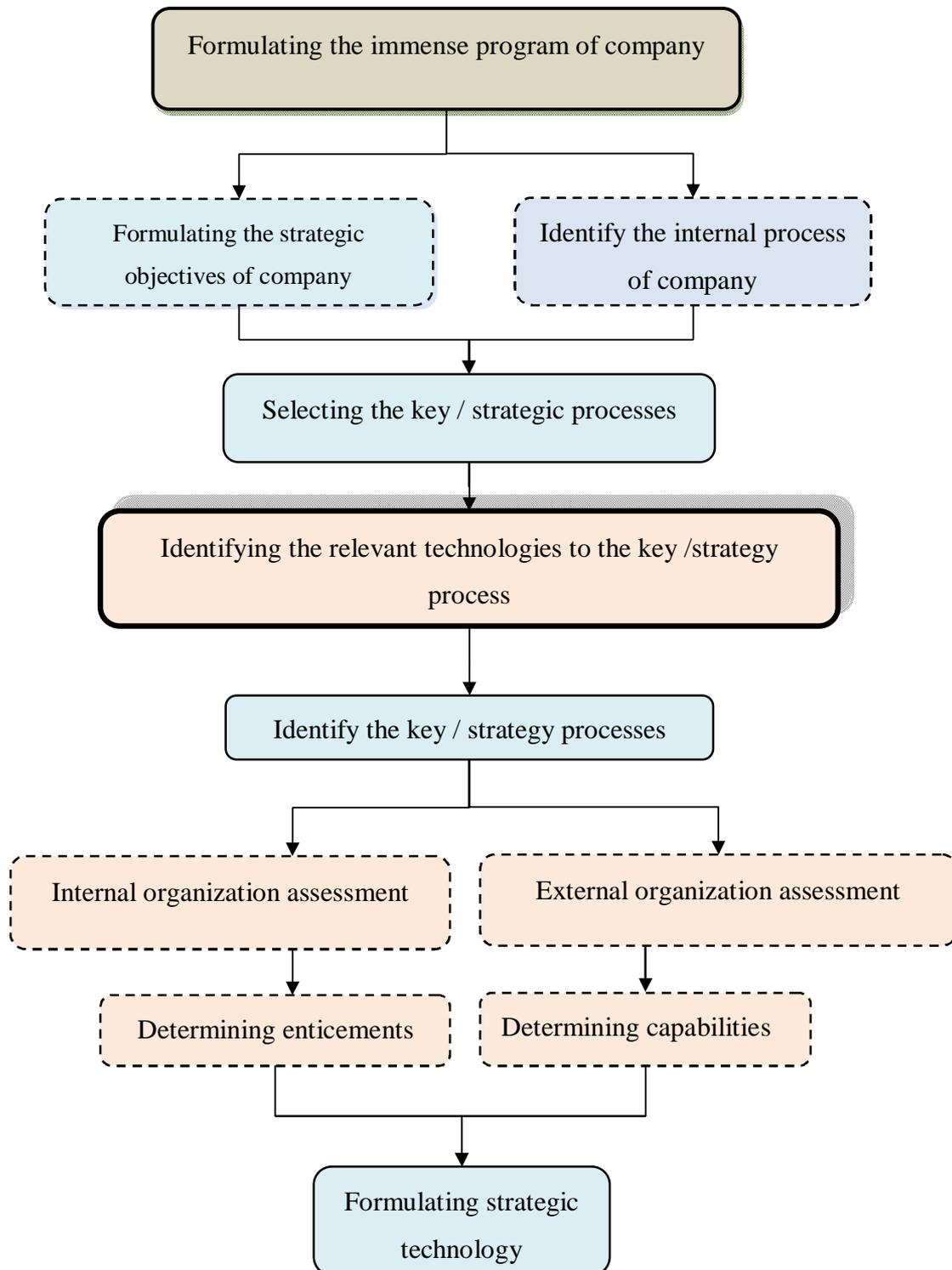


Figure1: Formulating the immense program of company

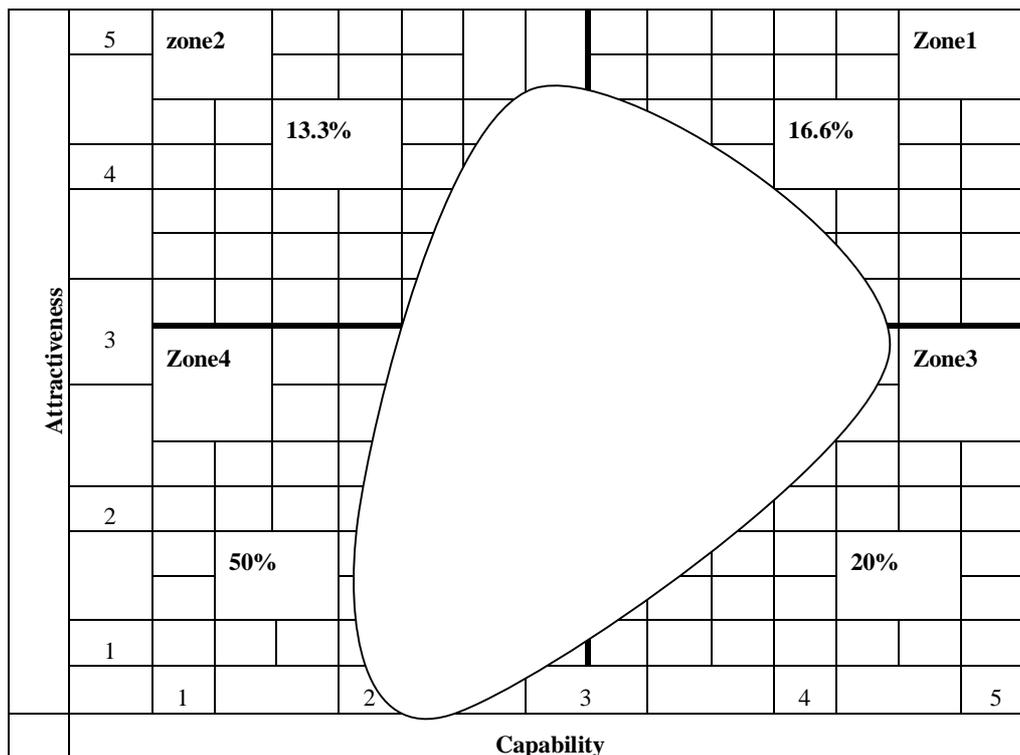
**5-CONCLUSIONS AND RECOMMENDATIONS:**

According to data analysis results, position of each strategic technology shall be defined in the attractiveness – capability matrix. Figure 1 each one shows the certain zones and its particular feature. According to the description in Table 1, following definitions are provided: Location analysis of all technologies in the attractiveness-capability matrix.

Each technology is defined in the matrix, with numbers of attractiveness and capability evaluation that is called a regular pair; the space would include these regular pairs, so-called portfolio. Figure 3 shows the space that sets strategic technologies related to key processes and containing 30 technologies.

**Table1: Attractiveness – Capability matrix (Source: Tabatabaian, Seyed Habibollah, 2002)**

Attractiveness	Zone3 High attractiveness- low Capability	Zone1 High attractiveness -high Capability
	Zone4 Low attractiveness – low Capability	Zone2 low attractiveness -high Capability
	Capability	



Analysis of position of each technology category in the Attractiveness – Capabilities matrix

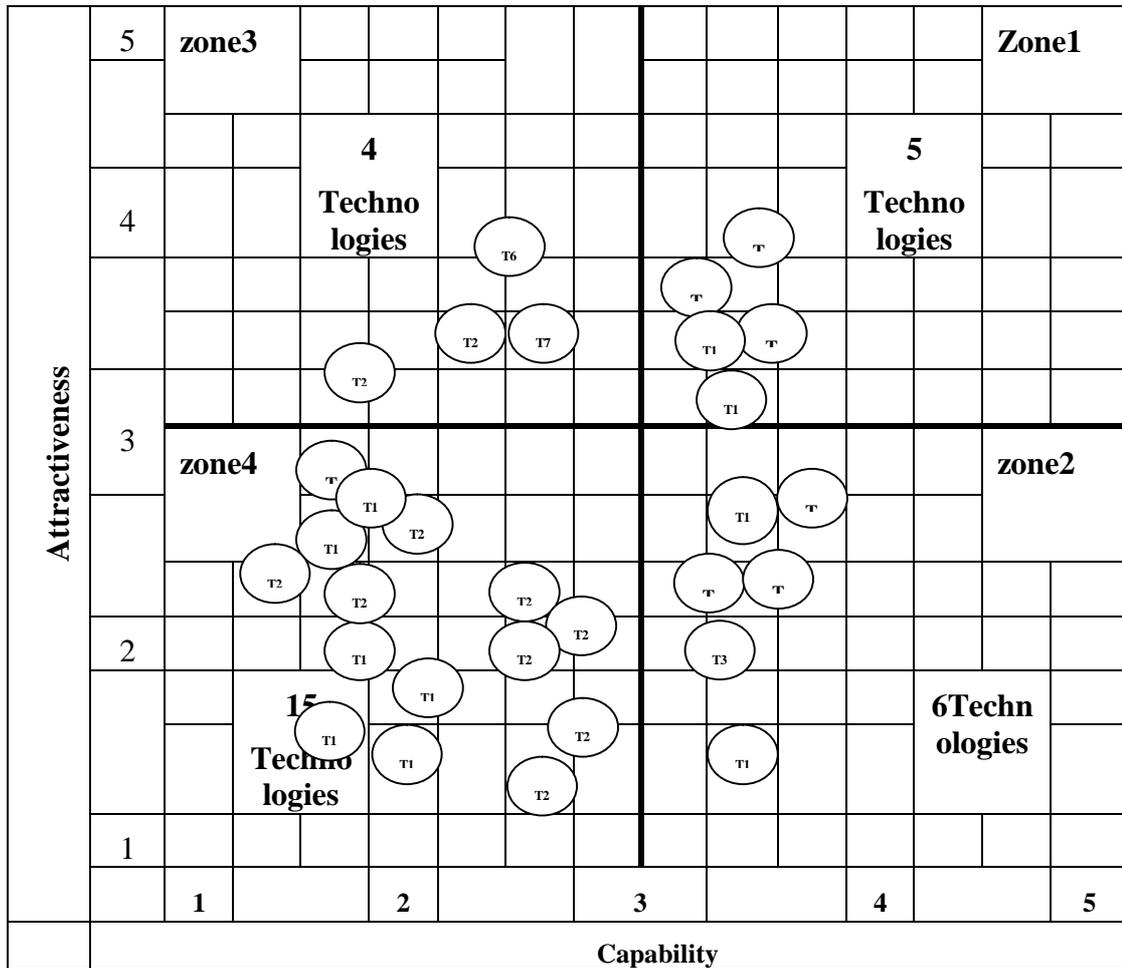


Figure 2: Strategic technology and their each location

At this point we were trying to formulate positions of technologies in each of the zone (Zone 1, Zone 2, Zone 3 and Zone 4). Figure 4 shows the number and location of each selected technology in each zone.

**5-1-Zone 1 (high attractiveness - high capability):**

As shown in Figure 4 five technologies equivalent to 16.6% of all technologies are located in this zone, these technologies have high attractiveness and high capability and are able to play

a major role for achieving the company's strategic objectives.

- The arc welding SMAW, plasma welding, painting work by making use of airless, latching slide, CNC lathe machine are of those five technologies located in this zone, the following instances are important points should be considered about this technology.
- Regarding to the importance of these technologies NadimGoshtaresh Persian Gulf

Shipbuilding Company shall be more sensitive to identify technologies advancement in this zone and monitoring their status.

- Most of the technologies which are located in this zone have not got a high level of industry (between numbers 3 and 4 are) from capability point of view. Therefore creating necessary infrastructures shall be created in order to take them under control and dominate them.
- Utilizing research and development in domain of these technologies and their performance assessment is very important and shall continuously be pursued.

#### **5-2-Zone 2 (low attractiveness - high capability):**

Technology of welding with argon and helium, dimensional control with leveling 3D camera, visual test (VT), air cushions, pressure test and penetration liquid test (PT) which are laid on this zone .

Laying these technologies in this zone is directly related to the history of activity of the company; Nadim Goshtaresh Persian Gulf Shipbuilding is a company more than 30 years experience in new-building and ship-repair, and has been considered as one

of the most experienced companies in this field. And technologies mentioned above are those ones that were utilized since long time ago in this company; it is natural that company put much of its ability to the high capability technologies and low attractiveness. On one side, lack of enough attention to the market and from the other side over-concentration on these can make the company face with problems in the competitive market. Therefore, by concerning the age of these technologies, replacing new technologies seems importance.

#### **5-3-Zone 3 (high attractiveness - low capability):**

Four technologies such as plasma cutting, Oxy-Fuel cutting machines, hardness test and vacuum test are considered strategic technologies in this zone, these technologies are very enticing, but the ability of industry in relationship with them are lower than average, due to importance of strategic technologies mentioned above, the shipbuilding industry shall take a prompt action to increase its capability and to examine the technological weakness for the technologies laying on this zone and find the strategies in order to solve this weak points.

According to newness of this technology in the Nadim Goshtaresh Persian Gulf Shipbuilding Company and also due to financial limitations it is recommended some of technologies mentioned above be chosen based on the capability measures of shipbuilding industry and appropriate measures be taken for exact recognizing and understanding this zone that has a high potential. Planning for making scientifically capable is one of other relevant items to enhance the capability level of this zone.

**5-4-Zone 4 (low attractiveness - low capability):**

CO2 Welding technology, manual sandblasting nozzle, air test, shielded gas arc welding, radial boring-machining, automatic painting, Copernicus piping, automatic shot-blast, lifting, fatigue test, carbon steel piping, stainless steel piping, magnetic particle test MT, submerged arc welding and torsion testing are 15 technologies are located in this zone, which is included about 50% of the total strategic technologies, these technologies are enticing and low capability.

It should be noted that any new investment on the technology in this zone is ruled by the industry, providing

technology or services from outside the company is not a great menace for activities and products of domestic companies.

In order to utilize the capabilities which are from outside, identifying the actual capabilities of the competitor and partner companies is critically considered. In these circumstances, the company shall outsource some activities associated with these technologies carefully. Supporting the contractors shall now be considered in order to provide relevant services with these technologies and their participation in this matter and grounds for long-term cooperation shall be provided.

**5-5-Suggestions for future research:**

According to conducting researches on the formulating strategy is recommended as following:

- It is recommended that utilizing positioning approach for market analysis should be given priority. It is also recommended that the leading companies in the world be used for comparing relevant companies.
- It is suggested that the researchers consider the model-resources approach based industries which are more dynamic with high rates

of change, because the models are in accordance with global changing conditions more.

- It is particularly important to choose an appropriate model that is more accordant to industrial characteristics and attributes.

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