Technological Vision in Automotive Industry and Presenting a Model for the Iranian Automotive Industry

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Abstract

This article aims at strategic vision to technology and suggests a strategic planning for this purpose. The main emphasis in this article is on strategic report compilation in the framework of strategic vision and covers issues such as identification of strategic planning dimensions and strategic vision levels, technology priority setting, environment monitoring, focus on customer needs, methods of strategic vision compilation and future research methods. This article also concentrates on R&D strategies in a separate section. Furthermore, a separate section is dedicated to strategic vision in automotive industry, and issues are discussed related to Iran Khodro Co. strategic visions. At the end, a model is presented for strategic vision compilation.

Keywords: technological vision, strategic planning, automotive industry.

1. STRATEGIC MANAGEMENT AND THE IMPORTANCE OF STRATEGIC VISION IN ORGANIZATIONS

Strategic vision compilation is one of the offspring of strategic approach in business. Organizations shall indentify strategic subjects and plan for them in order to sustain in competitive business. A subject is considered strategic if: It relates to competition, it is long term, it covers all three competitive, macro, and global levels and remains comprehensive, it affects positively on organizations survival. It's a fact that strategic management has originated in military areas but it can also be generalized to business, science and technology. Survival is also related to political and economical aspects. Production increase is also considered an essential factor for survival. Traces of acquiring national competitiveness are seen in Porter's studies and particularly in his diamond model where he put emphasis on local needs conditions, competitive degree, related industries competitiveness and factor condition. Factor condition itself includes such fundamental issues such as equipment, infrastructure, etc. and also advanced issues such as technology, knowledge, management, etc. Strategic management shall include planning, implementation and control. Strategic planning is applicable at all three levels including: business level, industry level, and national level. It is highly recommended that level of analysis be identified beforehand. Generally speaking, two competitive situations are considered to exist; each has its own advantages and problems. Organizations shall choose one of the following options before initiating planning process for future: 1) Leadership: organizations that formulate their competitive environment based on their own resources. 2) Follower: organizations which are affected by their competitive environment. The decision on choosing either way requires a complete study of the environment, especially the study of exiting external forces. The following diagram illustrates the external environment including competitive environment, macro environment, and international environment.

Competitive environment is the most crucial environments among others, for the fact that it

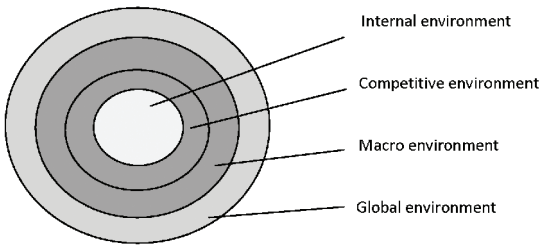

Fig. 1. external environment

includes such complicated issues like costumer power, supplier power, alternative products power, potential competitors' power and competition states among rivals. It has to be noted that industries competitive structure (based on size and number) can take either forms: Fragmented structure (small size, high numbers), or Consolidated structure (big size, low numbers). The assessment and measurement of demands and conditions of departing from industry is essential in strategic decisions of all organizations, for instance, when blue ocean strategy is taken, companies shall look for market rather than following strong rivals. Success can result from the absence of competition. Organizations shall pick up one or more limited number of their competitive advantages dimensions and shall concentrate their capabilities on them, because capabilities are limited and resources are scarce. The main and most important dimensions are: efficiency, quality, innovation, and responsiveness. It has to be taken into account that all four dimensions can never be compiled into one package. In each case, one shall be chosen while others are kept at a moderate level. All organizations are required to reach to a competitive advantage in technological innovations. Such technological innovations include innovations in both process and production.

Competitive advantage depends upon cost reduction and differentiation. In order to achieve more profit, it is required to higher prices while maintaining the costs equivalent to market or lowering the costs while maintaining the prices equivalent to market. In this case, competitive advantage is highly related to firms' competencies which relate to organizations unique strengths. Capabilities are those organization's skills and expertise which result in resources coordination and their productive exploitations. Ongoing competitive advantage is highly related to: Imitation limitation, General dynamics of industry (rapid changes in industry (, and Rivals capabilities which depend on their previous strategic obligations

The followings are issues which can result in organizations unsuccessfulness but can be overcome by a strategic thought: Organizations determinism (resistance to change), Previous strategic obligations (the continuation of current trends), Ikarus paradox (magnifying capabilities) (khodadad Hosseini & Azizi, 2010). In each strategic document a portion shall be dedicated to organizations priorities. Setting priority can be viewed from two perspectives: 1) Priorities: some particular issues which are important than other issues in each country, 2) Process of prioritizing: the Process to identify the priorities in each country and the pattern of relationship among players.

Priorities are classified as per followings, based on their subjects/functions: 1) Subjective priorities: it concentrates on general and emergent areas and covers a wide and extensive knowledge area. 2) Mission oriented priorities: it concentrates on a specific knowledge area to respond to a specific need. 3) Functional priorities: it concentrates on policies, and processes of knowledge management and technology, and may be applied to every knowledge area. Priorities are either short-term or long-term. Different types of prioritizing are as per following: 1) Centralized priority–setting: All priorities are set by a central person or institute. 2) Distributed priority–setting: Different bodies or players set their own priorities. Intelligence and relations are crucial in this case. Priority setting can be either continuous or project–based. In continues type, some organizations are assigned structurally for the right of setting priorities and for a definite period. In project–based, a non–permanent organization in the form of a working group or a specific commission does this job and may disappear after setting priorities (to take advantage of a wide range of experts, beneficiaries,). An intellectual priority–setting (to use limited number of experts) is another type in prioritizing.

2. STRATEGIC THINKING AND USING THE OPPORTUNITIES

Generally speaking, Strategic thinking gives an insight or understanding of present situation and also takes advantage of opportunities. This insight helps in distinguishing the market facts and also provides proper responses by giving innovative and valuable alternatives. Strategic management makes it possible for the manager to figure out the effective variables in achieving the goals and how these variables can create value for the customers.

The strategic thought is achieved thought an appropriate understanding of market regularities and innovative responses to those regularities in unstable environments of today's business. Without such thought, none of the efforts of organizations in

formulating strategies would be effective. Ohmae, a well-known theoretician in Strategic management, states in his book titled "The thought of a Strategist" that if we could not identify critical issues, no matter how much you put your personnel under pressure, you would never succeed. Thereby, Strategic thinking makes it possible to distinguish opportunities in competitions and identify the latent markets which have been overlooked by rivals. In other words, for Strategic decisions and taking advantage of opportunities with rather short life–cycle, you have to know the name of the game. Mintzberg considers Strategic thinking as an integral and holistic profile of business in mind, or an artistic Strategy formulation on the basis of creativity and an appropriate understanding of business as a holistic image.

Nowadays in many organizations, Strategic thinking is replaced by in adaptive and unreal Strategic planning with respect to present and future facts. While Strategic thinking and planning are complementary, strategic thinking creates vision with respect to current market facts and future trends which are required for the implementation of Strategic planning. One of the principles of strategic thinking is life-cycle thinking, meaning that concepts of technologies, products, markets and the most importantly opportunities which are created in complete changing and unstable markets follow life-cycle. This point of view is very important in understanding the challenges the organization encounters.

3. CONCEPTS OF STRATEGIC PLANNING AND STRATEGIC MANAGEMENT

There are different definitions for strategic planning. For instance in Britannica, strategy is defined as the art of planning and operational guide and to avoid confusing with TACTICs it should have three characteristics: 1) Broad in scope, 2) Longer in time, 3) Mass transfer of forces.

4. APPROACHES AND LEVELS OF STRATEGY

Different approaches in strategy formulation are as follows:

A) Prescriptive approach (planned strategy): It means formal designation and analytical prediction for long-term objectives. Believers of this approach are Andrews, Chandler and Ansoff. They believe that strategy formation comes out from an analytical and framed process. In other words, they assume that future's environmental conditions are logical results of today's environmental conditions. Strategy formulation is a step by step process. Some techniques such as BCG (Boston Consulting Group) Matrix, SWOT, GE (General Electric), SPACE (Strategic Position and Action Evaluation) and IFE (Internal Factor Evaluation) and EFE (External Factor Evaluation) Matrices are used.

B) Descriptive approach (creative strategy): On time acts which are based on the current situation. The theorists of this approach are Libendum, Queen, Mintzberg and Garry Hamel. They reject analysis in strategy formulation and believe that strategy is the science of cause and effect not logic. Also, they point to radical nonlinear and unpredictable changes in the environment. Gary Hamel knows his job is making the company strategic not strategic planning. Henry Mintzberg thinks that an effective strategy is an emergent phenomenon and stresses that processes can't form strategies.

C) Contingency approach: It has not been universalized yet and has some specifications of each of the above-mentioned approaches.

Besides, strategy levels are: 1) Corporate level, 2) Business level (which units are resources allocated to?), 3) Function-Operation level (type of activity and entering what industry), 4) Process level.

Strategic planning is a process consisting of three important and interrelated stages: Strategy formulation: (strategic prospect and strategy formulation), Strategy implementation: includes all the activities which have to be done and assigning appropriate operational units for executing strategic projects, Strategy evaluation: includes performance parameters, feedback and constant improvement of learning process in an organization which makes it possible to refine and revise strategies and plans.

5. FORMULATION OF TECHNOLOGY STRATEGY

Technology management is successful when there is a good relation between business strategy and technology strategy. Technology strategy is implementation, development and maintenance of organization's knowledge and capabilities. Although

technology is a very important factor, solely it is not enough to guaranty success of the business. A successful business needs integrating creative technology with production, marketing, finance and human resource to achieve goals.

6. A REVIEW OF LITERATURE AND CONCEPTS OF VISION PLANNING

Moris Blondel, a famous philosopher, believes that "future can't be predicted, it should be made". Vision is neither prediction nor future study, but is a way of thinking about task benefit and it is against destiny. Vision tells that 'future is the reason of existence of present'. Vision is unsure and a way of controlling future. Generally, there are three types of attitudes towards future: Passive, Adaptive, and Willpower-oriented.

1) Passive attitude: future is out of control and determined and there is no way to change it. (No planning), 2) Adaptive attitude: This attitude is based on quick and inevitable changes (written or unwritten). In this attitude the aim is predicting future changes and promoting opportunities to adapt with future. (Planning and prediction), 3) Willpower-oriented attitude: Future is not necessarily the result of present and at least some major parts of it are related to the events at present. Therefore, thinking about task benefit along with being against destiny is a principle in this attitude. (Ideal Planning-Commercial Ministry1388)

Future is not attainable, but it should be made. Hence, future is not where we go, but is where we build. Obviously, future is still being built. It is a phenomenon societies are able to design and shape by taking targeted actions. To act wisely, societies should know the results of their and others' actions and reactions and also be aware of out of control forces. These results will show up only in the future. Therefore, not only do societies try to monitor current events, but also they try to learn and understand liable and potential events or events which will occur under certain circumstances and try to have influences on occurrence, avoiding or quality of their occurrence. Societies by these methods will be able to get informed of present and future situations and organize their path to future and take advantages of time and cultural, social and scientific amenities (Mobini Dehkordi 1386). Now we are more concentrated on the concept of futures study as a base for visioning.

Futures study consists of a set of efforts which visualizes potential futures and plans for them using resources analysis, patterns and change or stability factors. Futures study reflects how tomorrow is born from the changes in today. The plural form (futures) is used because by using a broad spectrum of methodologies, not only one future but also some possible futures is speculated wisely and systematically. Futures study includes types of "possible", "likely" and "desired" to change from today to future.

Approaches of futures study: As far as common sense is concerned, man must be aware of events in the future, what events are more probable to happen and what has more utility. So, there are three approaches to futures study: * Analytical futures study or exploring futures study, * Imaginative futures study, * Normal futures study or cooperative futures study.

Methods of futures study are: Horizon scanning, Delphi, Trend analysis, Drivers Analysis, Scenarios, Visioning, Road map, Back Casting, Modeling, Gaming and Simulation, and Combination of the approaches above: The best approach is employing various futures study approaches in a project. The diagram in this slide show an example of the way of using these futures study approaches and relation among them and conventional order of these techniques (Weblog of Strategic Management-1388).

7. STRATEGIC PLANNING BY VISION

Changing trend of attitudes towards future has created different kinds of planning methods. This trend evolved from not relying on planning to relying on foretelling plans (the 50th) and by lack of right attitude towards the existing future in these methods, ideal planning was born (the 70th). During the 90th and later, this attitude completed and words like will-power orientation and visioning came out. The distinguishing point of this method in the beginning stage is the focus on "tomorrow" against "today" in the formulation stage. Is the future we depicted really will-power-oriented future or captured in the past? The answer to this question is the distinguishing point of vision planning from conventional planning. In conventional methods first, a picture of future is created based on the current status and problems. In

other words, the current status is first analyzed and external strong and weak points along with opportunities and threats are identified. Then, according to these factors a perspective is presented. Whereas in vision planning, to avoid confusion by present status, problems and limitations, the first stage begins with a vision and the focus is on finding a solution rather than on problems.

In planning by vision the balance between what can be done and what is impossible is crucial. The balance follows the steps below: 1) Presenting a primary vision, 2) Testing the vision, 3) Restating the vision, 4) Identifying the necessary steps to reach the vision.

8. NECESSITY OF FORMULATING TECHNOLOGICAL VISION FOR AN ORGANIZATION

Successful firms are the pioneers of technological innovations. Technological innovations management in low-tech and high-tech industries will usually fail. Some managers do not change as technology changes. These are the enemies of the organization's success. It should be noted that technological innovations management is a part of strategic development of an organization, since new technologies, prototypes and new products are developed in this part. Two effective variables on technology strategy are listed below: Internal variables (leadership, center of power), External variables (technological advances, technology lifecycle, product life cycle, competitive dynamism)

Part of strategic decisions in technological visioning talks about R&D. Strategic decisions on R & D is multidimensional and includes tactical decisions and R & D mission, leadership reference and division of management responsibilities among managers should be clarified. Selecting these things empowers technology strategy of the company and enhances co operations among researchers. The approach can be centralized, decentralized or something in between. About radical innovations, new organization structure is needed.

9. THE INDUSTRY OF AUTOMOBILE IN THE WORLD

The automotive industry is one of the world's most important industries, which is considered as a main sign of the Industrial Development of countries. Recognizing the importance of this industry, many current developed countries underpinning appropriate strategies to promote it. Growth of the industry eventually led to more income, more jobs and has been developed the other economic sectors. In modern societies that machines have penetrated the fabric of society, Car is considered as a symbol of economic activity, cultural attitudes and human welfare. the automotive industry directly and indirectly impact on the textile, chemical, electrical and electronics, non-metallic mineral industry, steel industry, mechanical and manufacturing industries, Leather and synthetic coating industry and Wood or plastic and rubber industries. Thus it can be meaningfully connected the previous and next rings to each others. Also It is impressive in productive and non-productive services such as design and engineering companies, transportation ,repair shops, parts stores, customs services, maintenance services of machinery and equipment, services of buying and selling cars firms, , transfer of ownership documents services, police services , insurance & etc. Report of the German Automobile Industry Association (VDA), one of seven German jobs & one of four tax income are related to the automotive industry.

Now the world capacity for 80 million cars built, which are only 60 million cars are assembling therefore; this excess capacity is up to new markets. According to the survey, the world's most attractive market In terms of percentage growth is belongs to Asia especially in Middle East and Iran. A real example of the created opportunities is global economic crisis and its impacts on reducing of increasing vehicle's demand in U.S. & European markets especially Japan which has caused the serious economic situation for the automakers and parts makers in the world. European car makers Union (ACEA) has been announced sales drop 2.8 percent for the past two months. Renault and PSA Groups to coordinate with falling demand in Europe, respectively, equivalent to 20 and 30 percent of their production volumes have cut back. The forecasts of Renault Groups were based on their profit margins to 6% in 2009 but now they have satisfied to 3%.Companies, Daimler and Fiat in recent weeks, a sharp fall in profitability have declared and a stagnant market in 2009 has announced that it will have impacts on profitability. General Motors and Volvo also recently removed several vacancies, because it

seems voluntary goodbye -program was not effective. Last week, after Toyota, Honda and Nissan companies announced its automobile production. The rest of the world's major automakers have comparable status. The parts makers are among the consequences of the tsunami are not deprived and in Europe they have reduced staffing and production levels sharply. Even some of the companies such as Valeo, SKF, and Bosch were forced to shut down its major sites and their employees were fired. This is also in light of the strategic thinking of the best was modeled. The Model in which most of all the major categories of "R&D" is given. Statistics show that five automotive world, any more than the total annual income of "Iran Khodro" (about $ 11 billion) are spent on research costs. As mentioned, one of the important features of strategic thinking is discovering the new features of the market and takes advantage of timely created opportunities.

10. STRATEGY IN THE IRAN AUTOMOTIVE INDUSTRY

The automotive industry in Iran was founded in 1959. The most evolution of this industry in the 1960s is founding of "Iran National Company". Since the beginning of the process it shows that despite the volatility of this industry in the decision-making, economic and political crisis, cynicism and etc has reached important results. If compare sales of the car makers & parts makers Companies in the Tehran Stock Exchange with a GDP of country, we see considerable growth since 1999. In global scale of this industry in 2000, with production of more than 1287 billion dollars, its share of world GDP to about 7.3% lead. Automotive Industry always due to its effectiveness in economic and industrial development of countries, particularly in developing countries, has special attention.

Iran's automotive industry over the last eight years with average growth of 30 percent could reach production of 1000 units in 1996 to 900000 units last year. The volume of unanswered demands in a 20-year period, gave the opportunity to automakers to sell their products in a market without competing and without fear. In many cases, the price of the car received a few months ahead. Cooperation between Iranian with French, Korean and Japanese big automotive companies Led to find very different picture the streets of the Iranian than the first 20-years of revolution. PEYKAN was out three months ago, as a sole-brand in the market for 40 years and has been eliminated from the pulls. Widespread and massive public investment and a ban on car imports causes that Iranian automotive industry become great powers in market and the stock Exchange and undertake a decisive role in the market. Production in the industrial sector in Iran of about 20,048 units of light vehicles (cars, two differentials vans,) was started and it reached its peak of 163,393 units in 1978. After the revolution, driven by the desire to have luxury cars, as well as war, this industry has dropped in and in 1989 produced the lowest were 21,918 units a year. But since 1990, the production gradually increased to 44,665 units and in 2003 reached to 732,906 units. Regardless of the criticisms against the industry, in terms of quantity, has average significant growth of 126 percent.

In Iran, the strategy has not been defined and documented for the automotive industry. The first step in this regard, was conducted. By the Iranian Parliament passed a law in 1992 " how to calculate and collect customs duties, income tax, business and vehicle types of vehicles and construction machinery and relevant spare parts are imported and locally manufactured(Called the vehicle Law). The law, however, not strategic but the same law as the foundation of the industrial sector will be discussed. Ministry of Industries and Mines announced earlier that following several meetings of experts, the strategy of this industry has developed aims to make the car competitive. Under this program, automakers must obey all safety standards, emissions and fuel consumption in accordance with a scheduled plan. Thus, for any vehicle, based on capacity, engine size and number of passengers, a certain fuel consumption limit is considered. For example, if consumption per 100 km exceeds the considered limit, per each liter plus consumption, car manufacturer should pay a fine based on the new formula. For emission standards, European standards have been chosen as a criterion which shall be met by auto makers. Facilitate entry of the private sector to building the car, has been announced as one of the most important part of this program. Other items of this programs is that, current and new applicants if they want to be doing , they can only sign contract with the automakers with at least 200 thousand units annual production rate with product life time of not less than 4 years. Ministry of

Industry and Mines hopes that this situation leads the investors to build new auto plant.

In the unfavorable economic environment which the industry takes a lot of pressure, the automotive industry has been able to achieve considerable progress which increase the production is only one of its prospects. Therefore a disproportion of growth between this sector and other sectors has occurred. Today automobile industry is most growing sector between different industry sectors and from this point of view can be a pattern for other industries. Thus, if the strategic plan for the industry is concerned, it should also be able to meet the growth and development as well as possibility of interaction with other sectors of the industry. However, the country's auto industry is different with eight years ago, and domestic manufacturers, to sale of these volumes of production, have been forced to consider production standards. It seems that auto industry in Iran has reached a decisive stage and auto makers has faced to difficult exam, because with continuing this dazzling growth, production will Surpassed domestic demand and the executives of the industry should be search customers abroad. The recent economic crisis, has created a suitable opportunity for IKCO as massive , and for ISACO specially to be Able to get the special rates and utilization of successful and conventional methods such as Co-Branding and Joint-Venture together with attraction of foreign investments, do activity In a higher position Than in the past in line with its strategic objectives. As private companies who importing foreign vehicles with using a very special price conditions have been very extensive preparations for participation in the market of below 300,000,000 Rials Vehicles in the country, provided with appropriate conditions, in an effort to gain a larger share of this market, it is necessary to maintain domestic market share while more attention to The quality issue, cost and diversity (which appears under the patronage of R&D), together with provide varied and interesting sale options , somewhat to deal with this problem. Growing trend of GDP and Limited market capacity from one side and import growth (63% growth in the first 9 month of the year) from the other side, it is necessary to speeding up in finding new markets and achieves export targets that is possible with joint venture cooperation with the world's major automakers and act as a regional base (Despite the political obstacles, the field is ready more than ever), which is exactly what Turkey did and increase the border of export to 500,000 units a per year. However, we must also create a culture of teamwork and direction to individual innovation, in a coherent set, establish the company's strategic thinking and exploiting the competitive advantage of the company, enjoy the opportunities that are of a very short life cycle in order to achieve the market share target.

11. VISION IN IRAN KHODRO

Iran Khodro Company has developed its strategic vision named "technologic vision 1395 in Iran khodro Industrial Group" based on the country's 20 years vision. In the country's 20 years vision, IRAN is a developed country with the first economic, scientific and technology position in the region, with Islamic and revolutionary identity, inspired in the Islamic World and with constructive engagement in international relations.

The overall framework of vision development is as follows:

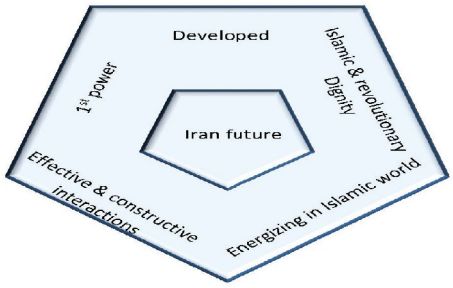

Fig. 2. Iran 20 years vision

Regardless of the details, we would mention some important points:

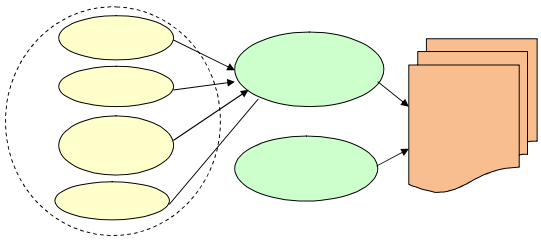

Fig. 3. overall framework of vision development

- The comprehensiveness of the vision is well and covers various aspects,
- However the vision is named technologic, but in many aspects it is closed to the overall vision of IKCO and does not concentrate on technology,
- Some different competitive dimensions considered and Any superiority over another is not clear,
- Good emphasis on localization has been made,
- Customer orientation has been emphasized,
- Some important values are ignored,
- About trustee of production, division is made but its basis has not mentioned in the slides,
- Global automotive trend has extracted (of course the method has not mentioned) but its conformity with the country's condition should be considered,
- Evaluation of customer needs and Desirability in form of current and static has considered and it is better that its future will also be studied ,
- Due to the changing economic and political conditions, it was Better that the vision was developed in form of scenario with a variety of conditions (normally, due to the retardation of companies from visions, After a while to be forgotten) ,
- Should be more emphasis on international relations took place,
- Some areas of technological are studied with details and suitable vision is drawn.

11. CONCLUSION

Due to the all considered issues, the model for development of the technologic vision is presented per below:

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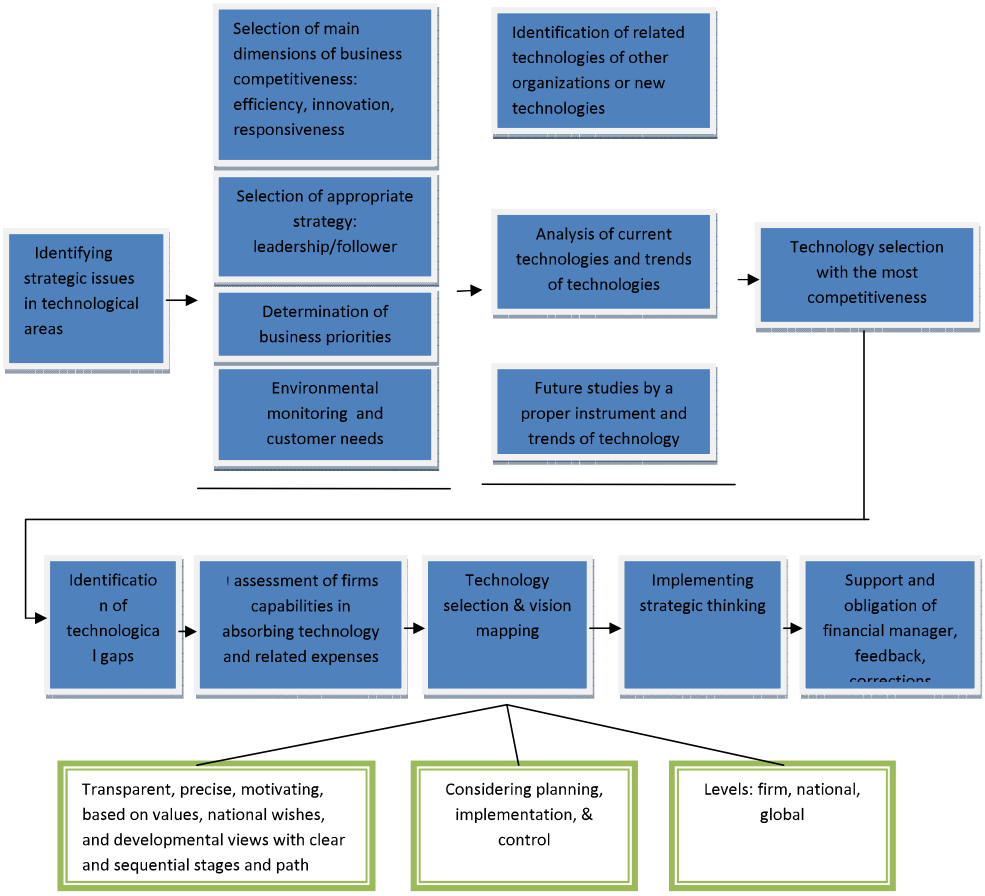

Fig. 4. development of the technologic vision

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