

Leadership Vision in Advanced Technology



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Abstract The technology knowledge of enterprises is the most crucial factor that determines their position and status in the market in today's age. Considering that knowledge and technology bring along innovations in product and service production, development, it clearly reveals that it should be dealt with in depth again. The fact that businesses change and develop their own undertakings and organizations within this consciousness necessitates a transformation to be experienced. Therefore, the training of the employees of the enterprises that use technology, produce the technology and direct the technology, the information sharing in the organization and the activities related to developing the existing technology, transferring the technology or producing the technology are not a necessity in the process as a success of their skills infrastructure. In this process, improving the skills of the human resources who produce and develop technology should take its place as the most crucial factor increasing the success of the enterprise. Because in the environment of change, companies that want to exist in the future can only maintain their competitive positions by acting in the strategic direction determined by the technology leader.

Keywords Technology · Leader · Technological management · Leadership vision

1 Introduction

In the globalized world, companies are turning to technology investment at a large and prohibitive cost to gain a competitive advantage. This situation increases the importance of technology management day by day. Technology is vital especially for companies that want to gain a competitive advantage in the global market.

There are many factors that influence the success of Technology Management (TM) in the organization. Leadership is the most effective one of these variables. In

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this context, the role of leadership skills in Technology Management further increases the importance of the leader over financial and engineering factors in terms of being capable of managing and guiding other resources.

Today's research has found many findings that support the clear and obvious effects of the leader's success in the organization. In Technology Management, knowledge is limited in what are the critical skills of technology leaders and what skills should help them with how they should behave according to the type of technology to understand effective leadership.

Constantly changing environmental conditions develop new methods and new perspectives in production and management processes; it also changes the shaping of organizations. These new developments reveal new types of leadership and skills. It is obvious that the crucial factor based on these developments is rapid developments in technology.

In terms of effectiveness in technology, it is taken from a new perspective that production technologies should now be developed instead of the concept of installing production systems in the old system, which is evaluated as the ratio between input and output, which is carried out only with efficient production in terms of competition. It is envisaged that the most important investments to be made shall also be the human factor that uses and manages technology in the formulation of materials, labor, time, land and energy factors used effectively at the lowest cost.

One of the factors that makes it possible for companies to produce an effective technology is the ability to manage the technology, and these skills should be learned and researched in such a way that they can identify and develop other factors. While technology is a complex process, it is easily understood that improvements and innovations can be realized through self-aware work in relation to service and product, considering that it is a method that takes shape with systematic and development activities.

1.1 Leadership

As with all social sciences, it is unlikely to bring only one definition to concepts in management science. An analogous situation can be considered to apply to the concept of leadership. When the literature on management science is reviewed, it is not possible to encounter a meaning or definition that is accepted by everyone for leadership. In this context, each definition expresses different dimensions and aspects of the concept of leadership and sheds light on different angles. In order to realize the goals of two or more people, it can be stated that it is imperative to mention the phenomenon of leader, leadership and follower in each group of communities they create by interacting with each other, harmoniously combining their strengths, times, financial resources and efforts [1].

The definition of leadership has been tried to be explained with many concepts to date and has been discussed in different dimensions. To explain it broadly, the leader can be defined as a person who "trusts and gains their trust in the quality team

he has gathered around him insofar as his self-belief; knows how to always strain himself and those in the field of management to learn something new; knows how to do the right thing by not forgetting the lessons he has learned; work with not only his side but also his environment in mind; being self-motivated as well as that he can do this in the lower ranks in a viewer position; knows how to be a mirror of the people he manages insofar as has the courage to see himself in the mirror; being undeterred for any defeat and provides lower level managers to adopt this feature; knows how to listen and remember rather than talk; praises the good doer and shows the truth to the wrong doer; is not afraid to take risks after calculating with his return and his benefits; be able to assume and distribute its obligations; can set an example around with his sound and healthy body and mind; not considers defeats as results and achievements as goals; use his time well as well that the timing is perfect; can respect himself as well as his environment and even his opponents; go down to the source of information and use it in the best way; understand the need to head the follower he drags insofar as the need to go after them; can decide when necessary; prepares the environment for him to be creative in the people he works with as well as himself; and create and be proud of the opportunities, desires and conditions of raising many people who can take over after himself" [2].

The spread of leadership to such a wide area and the need to become a leader or connect with the leader in public has led to numerous research on the subject, and many branches of science have tried to define leadership from their point of view. This has led to the concept of leadership having a parallel definition of each number of studies [3].

Leadership has been one of the most researched subjects in the 20th century. During this period, both researchers and theorists carried out much research in many fields to analyze leadership. As a result of this intensive effort, it was possible to reveal more than 5.000 studies and more than 350 definitions in the literature [4].

Among the most important reasons why the phenomenon of leadership is important for organizations, features are shown such as the inability of organizational plans or programs to predict everything, the environment in which the organizations are located is extremely dynamic and slippery, the faces of organizational structures are inherently forward-looking, and the most important element of organizations has a variable, unpredictable and complex structure [5].

The leader is the one who encourages people to voluntarily strive to achieve organizational goals on a group under a certain situation, time and conditions, helps them achieve common goals, conveys his experiences, and ensures that their followers are satisfied with the type of leadership implemented [6], while leadership is the process of influencing group activities to achieve the goals [3].

Another definition of leadership is the effort to get organized members to achieve what one desires [7]. It can be stated that this definition defines the concept of leadership from a different dimension, that is, from a leader's perspective, and includes the meaning of "attempting to take leadership from the hand of the person leading any group" [3].

1.2 Leadership Skills

Leadership skills can be considered as innate and later skills as the basic skills of the leader, and many studies have researched what are the leadership skills related to this subject. As an inventory of skills, the study of Thamhain (1992), obtained by asking 355 technical managers, is included in the literature as a sequential list of skills.

Skills are most divided into three classes. These are: managerial, technical and individual skills.

1.2.1 Managerial Skills

These skills, which are in the category of important skills in leadership skills, include the following skills:

- Technical planning, programming, budgeting, organizing and employee management on management-related tasks,
- Effective determination and estimation of resources,
- Being able to measure and report on performance and business status,
- Being able to see the procedures and policies as guidance on all kinds of activities of the leader,
- Having no problems with handing over jobs, when necessary,
- Good meeting preparation and report writing skills,
- Be able to perform effectively when there is a need for change or to complete an interrupted job,
- Organizing social events,
- Support for management within the company and being able to work effectively with all groups can be counted as the skills of the technology leader as the main managerial skills.

1.2.2 Technical Skills

The following skills can be listed as technical skills that are the skills the leader needs most in the use and management of technology:

- Being able to understand and follow technological trends in all areas of responsibility of the company and the company's business circle,
- Knowing the product applications, market and economic conditions related to its field well,
- Being able to communicate effectively with employees in other technical branches,
- Being able to establish a technical team in line with the project objectives and to provide opportunities for group decision making,
- Having a system approach in the field of technical work,
- Reliance on the technical knowledge of the employees in the business circle,

- Being able to use the latest design techniques and engineering tools,
- Being able to recognize and work with technological inventions and developments,
- Measuring the technical performance and project status of other people on the team
- Integrating the technical work of team members.

1.2.3 Individual Skills

Lastly, leadership skills, which are the most individual skills of all skills, can be summarized as follows:

- How to get contact with other technical and management-related units,
- Being able to solve conflicts on technical and individual issues effectively,
- Being able to work with all units in the organization,
- Success in connecting with units outside the organization and other departments,
- Socializing with people,
- Being able to convince people about things they do not want to do,
- Loyalty to its employees who are not directly affiliated with the leader,
- People like to work together and consider the leader's recommendations
- Frequently receiving opinions of colleagues in decisions taken to present them to senior management,
- Showing team leader by group members within the section where the leader is working.

2 Methods

2.1 Technology

Technology is scientific applications to achieve commercial value [8] or technology can be defined as the ways and methods used by people when engaged in manufacturing activities, or all the techniques that people have and use to change their environment.

The history and development of technology, which can be described as the method of production in the simplest sense, dates to the ages when humanity fought for existence and created its first intellectual equipment for this sake [9].

According to the understanding of social determinism, social development is determined entirely by the type of technology that society invented, developed or promoted.

Technology is all the information that one has and uses to change the environment in which one lives in general with the aim of making it more useful to him [3].

In other words, technology is scientific and engineering information that can be applied to the design of products or processes or to research of newly processed information [10].

There are three elements in technology. These are as follows:

- Material element: Machinery and equipment,
- Intellectual element: Technical knowledge (Know-how),
- Referral and administrative element.

Technology is a perishable resource consisting of information, capabilities and tools necessary for the production, distribution and maintenance of goods and services with economic or social demand, use and control of production factors for distribution and maintenance [11].

Technology can be defined as the sum of the information that people apply when engaged in production activities to create benefits. Technology such as natural resources, labor and capital is also a production factor.

Technology is a collection of information that increases the amount of production, improves its quality, changes its form and quality, that is, helps to realize human needs in the best way.

The selection, development and shaping of any technology is directly a human activity and the active party is people. The active acceptance of humans will prevent the technological level from being accepted as data, so that the creation of alternative technologies can be considered as a human activity since technology is designated as a human activity [12].

2.2 Technological Management and Competitive Advantage

The concept of competitive superiority means that a business gains an advantage in the market against its competitors by creating good customers. There are many ways to gain competitive advantage. Gaining price and quality advantage over competitors, obtaining new market opportunities that will create customer value before competitors, being able to respond quickly to changing customer demands and needs are among the methods of gaining competitive advantage.

In today's market environment, where competitive factors are similar, companies should use high technology as a factor that will differentiate from each other and provide a competitive advantage. Aware of this, businesses are moving towards employing people with visions who can use technology with knowledge and direct technology with creative personality traits. In the business world, studies have started to be conducted on the development and management of competencies in relation to the progress of this trend in human resources planning [13].

The modern technology and the resulting criteria depend on the product team as well as the criteria within the organization. The benefits of modern technology should be supported in the right decisions and spread throughout the organization. In this case, the technology leader plays a key role in managing technology as the

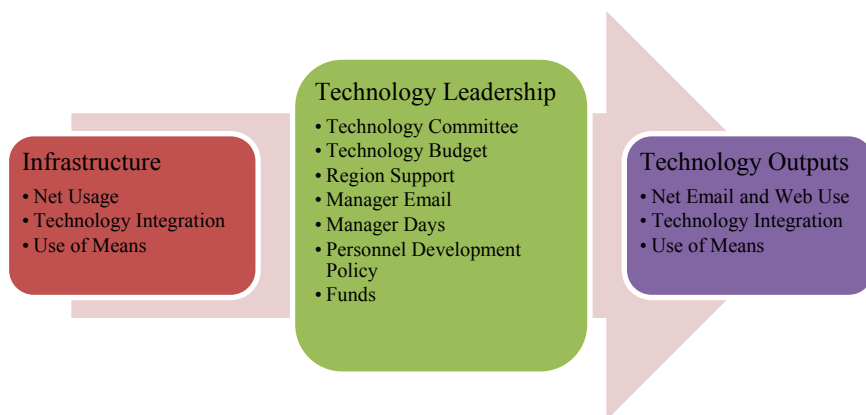


Fig. 1 Technology leadership model [14]

person who assumes this responsibility. It is important for the leader to have the most effective knowledge about what basic skills and competencies the individuals in the organization should have as a team as a decision maker. The features that the technology leader must have and manage, and the issues that should be specifically addressed in the company in which he is employed, are specified in Fig. 1 [14].

Technology also covers all production and sales processes starting from research in enterprises and reaching the customer from manufacturing. Technology is one of the most obvious factors affecting the performance of the enterprise. Modern technology includes information and methods to save raw materials, materials, labor and time used.

Other factors of the enterprise, human resource contributes with the elements such as innovation, invention, knowledge and ability level, value judgments about the use of technology and the production of modern technology. In this context, an understanding and knowledge of management skills are required to provide a mutual understanding between these factors in technology management.

The technology leader should be able to analyze in budget planning, sourcing, technology policy setting, future research, and be a guide on issues such as long-term investment and growth.

The potential use of workforce physically, intellectually, wholeheartedly depends on an effective leadership style. Managers need to be constantly trained for the business to gain dynamism and managers to achieve the expected performance. The complexity of businesses and the way they do business, the uncertainty of technology, sudden changes necessitate conscious management. Ensuring the best use of human resources and instilling creative and innovative individuals in team spirit should be adopted by starting from the highest level in cooperation [15].

3 Results

3.1 Technology Management

Technology Management can be defined as a collection of activities related to the launch of new or innovative products [16].

Technology Management is the planning, development and implementation of the technological capacity needed to shape and achieve the strategic and tactical objectives of an organization. It is to establish the connection between management and technical expertise and increase the efficiency with the technology used, and all activities related to planning, organizing, coordinating and controlling activities for technology transfer, technology marketing, technological planning, R&D, design, manufacturing, sampling, testing, as well as technology procurement and technology development [17].

Since technology management, as it can be seen, has different activities, it takes a lot of effort to examine them together [17]. Technology management is a process that involves different disciplines and requires effective knowledge about developing technical, conceptual and scientific models. Technology management covers research method, product and process development and manufacturing engineering. From this definition, three important results emerge:

- Technology is divided into a matter and an information part,
- It is the information part that really represents the technology,
- Dispatch and management techniques are also included in the technological information part.

In this case, the social sciences examining the management part and the engineering sciences examining the matter part are synthesized together within the scope of technology management.

Having technological developments and technological innovations is especially important in increasing productivity and competition. R&D and technology development investments are investments that require profitable and qualified personnel in the long term. Successful businesses focus more on technology management than their less successful competitors, for example, integration of design and production, the balance between product and R&D process, and the integration and development of technology developed outside. It is important to manage the technology management and R&D strategies of enterprises through technological leaders as specified in Fig. 2.

Technological innovation and R&D strategies implemented by enterprises, technology management are all activities related to planning, organizing, coordinating and controlling activities for the provision and development of technology such as technology transfer, technology marketing, technological planning, R&D, design, manufacturing, prototyping, testing, and to establish the connection between management and expertise.

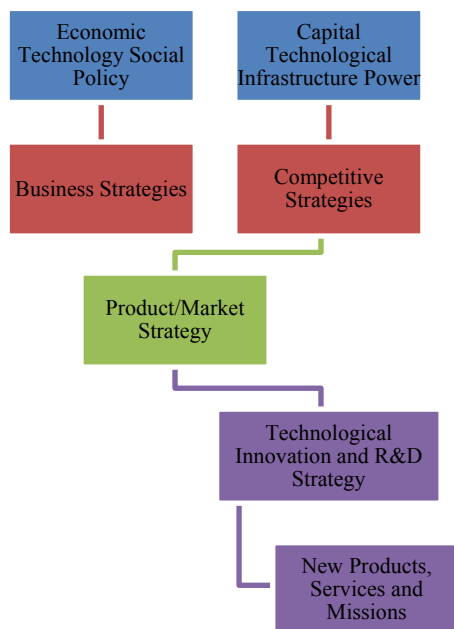


Fig. 2 Technological innovation and R&D strategy of enterprises [18]

3.2 *Technological Management and Competitive Superiority Skills*

A manager equipped with adequate and technically competent and effective skills can select more advanced technologies. First, the choice of capital-intensive technology brings with it various problems as well as reducing economic effectiveness. In addition, technology causes unemployment.

In the early years of development, it would be more accurate to import labor-intensive technology, use appropriate personnel and then reveal the necessary techniques for technology and gradually move to capital intensive technology [19].

Countries or businesses that transfer technology need to make much more efforts to develop imported technology as well with the help of domestic experts who have adopted these problems about which technologies will be useful and which will be harmful [20].

At this point, businesses need to determine the position in which their awareness of technology is present. Awareness of technology acquisition is an ongoing process starting from society.

4 Conclusion

Leadership conceptual and practical definition is an ever-changing and increasingly critical issue. The need for leaders comes across as a unit where companies that want to be the business of the future spend large investment amounts as training and development in the relevant units where leaders constantly update their knowledge and skills to maintain their presence in the business world with flexible, changeable features. In addition, companies that are in the race to have leaders who will make their businesses successful are in a race to add added value to their companies with this awareness and to recruit young leaders with potentially high leadership skills.

The necessity and importance of the leaders in achieving the desired lofty goals of all organizations and countries, companies, is clear. Highly skilled and effectively skilled leaders will gain a competitive advantage with their changes and creativity in the way business life included in the business world and effective management methods in the effective shaping of the organization.

Although the decisions of the leader on where the technology will go are shaped by customer requests and expectations, the importance of the human direction that governs the technology depends on the skills of the leader and his team in developing new products, modern technologies in this technological environment, since the technology progressor is the employees in the enterprise.

One of the reasons why the technology leader is so important and influential is his contributions directly to the future of the business.

Today, people no longer have a firm idea of where the technology will go, but the place where the rapidly developing technology will arrive in this process has a dimension that concerns the society. However, the enterprises that manage the technology can work on how innovations and changes can be made, which is the other dimension of technology, questioning what can be done and even predicting with technology maps.

Businesses operating in the success of technology can explain this result with the dependence between the best organizational units. The technological environment is especially important, as the classifications can be used for all environmental factors, according to research by Perrow and Thompson. The leader is also of immense importance in terms of managing the organization organized in the face of the technological environment.

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