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**M.Sc. in Industrial Engineering**

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**REPUBLIC OF TURKEY  
GAZIANTEP UNIVERSITY  
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**TECHNOLOGY TRANSFER AND DEVELOPMENT WITH  
PUBLIC PROCUREMENT  
SSO SMART PURCHASING MODEL EXAMPLE**

**M.Sc. THESIS  
IN  
INDUSTRIAL ENGINEERING**

**BY  
SUAT YAMAÇ  
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**M.Sc. Thesis**

**in**

**Industrial Engineering**

**Gaziantep University**

**Supervisor**

**Prof. Dr. Serap ULUSAM SEÇKİNER**

**by**

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**June 2019**



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REPUBLIC OF TURKEY  
GAZIANTEP UNIVERSITY  
GRADUATE SCHOOL OF NATURAL & APPLIED SCIENCES  
INDUSTRIAL ENGINEERING

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**Suat YAMAÇ**

## **ABSTRACT**

### **TECHNOLOGY TRANSFER AND DEVELOPMENT WITH PUBLIC PROCUREMENT SSO SMART PURCHASING MODEL EXAMPLE**

**YAMAÇ, Suat**

**M.Sc. in Industrial Engineering**

**Supervisor: Prof. Dr. Serap ULUSAM SEÇKİNER**

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It is vital that our country believe in primitive unmanned sales as leverage. But there are some problems in front of it. Through public procurement; and an entrepreneurship ecosystem and public procurement research for innovation, localization, technology transfer and entrepreneurship, a business model innovation in the Canvas Business Model was proposed and SSO Techno Catalog Platform was prepared as solution for the first stage solution, solved by means of the State Supply Office (SSO) of the Central Purchasing Agency of Turkey. SSO Techno Catalog Platform is a platform that enhances the marketing competencies of our entrepreneurs and accelerates the process of commercialization and brand processes. The SSO Techno Catalog Platform is a start-up training for managing the public procurement in our country with the understanding of technology management, for the Technology Readiness Level and the entrepreneurial ecosystem in a common language.

**Key Words:** Public Procurement, SSO Techno Catalog Platform, Canvas Business Model, Commercialization, Technology Transfer

## ÖZET

### KAMU ALIMLARIYLA TEKNOLOJİ TRANSFERİ VE KALKINMA DMO AKILLI SATINALMA MODELİ ÖRNEĞİ

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Ülkemiz kalkınma sürecinde kamu alımlarının kaldıraç olarak kullanılması hayati önemdedir. Fakat bunun önünde bir takım problemler bulunmaktadır. Kamu alımları yoluyla; yeniliği, yerliliği, teknoloji transferini ve girişimciliği desteklemek için girişimcilik ekosistemi ve kamu alımları tasarımcı düşünce yaklaşımı ele alınarak problemler tespit edilmiştir. Bu problemlere ülkemiz Merkezi Satınalma Kurumu Devlet Malzeme Ofisi (DMO) üzerinden Kanvas İş Modeli kullanılarak bir iş modeli inovasyonu önerilmiş ve 1. aşama çözüm önerisi olarak DMO Tekno Katalog Platformunun kurulması ile çözüm getirilmiştir. DMO Tekno Katalog Platformu girişimcilerimizin pazarlama yetkinliklerini geliştiren, ticarileşme ve markalaşma süreçlerini hızlandıran bir platformdur. DMO Tekno Katalog Platformu ülkemiz kamu alımlarının teknoloji yönetimi anlayışı ile yönetilmesi, Teknoloji Hazırlık Seviyesi ile girişimcilik ekosisteminin ortak dilde buluşması için bir başlangıç sunmaktadır.

**Anahtar Kelimeler:** Kamu Alımları, DMO Tekno Katalog Platformu, Kanvas İş Modeli, Ticarileşme, Teknoloji Transferi

*“To Ergün ÖZGÜN”*





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## **LIST OF ABBREVIATIONS**

<b>EU</b>	European Union
<b>R &amp; D</b>	Research and Development
<b>UN</b>	United Nations
<b>STSC</b>	Science and Technology Supreme Council
<b>SSO</b>	The State Supply Office
<b>SPO</b>	State Planning Organization
<b>ESA</b>	European Space Agency
<b>FDA</b>	American Food and Drug Administration
<b>GDP</b>	Gross Domestic Product
<b>ILO</b>	International Labor Organization
<b>DL</b>	Decree Law
<b>PPI</b>	Public Procurement Institution
<b>SMB</b>	Small and Medium Business
<b>SMEDO</b>	Small and Medium Enterprises Development Organization
<b>OECD</b>	Organization for Economic Cooperation and Development
<b>SSTC</b>	State Science and Technology Commission
<b>TPL</b>	Technology Preparatory Level
<b>TRL</b>	Technology Maturity Level
<b>STRCT</b>	Scientific and Technical Research Council of Turkey
<b>UNDP</b>	United Nations Development Program
<b>UNFSTD</b>	United Nations Science and Technology Development Fund
<b>UNIDO</b>	United Nations Industrial Development Organization
<b>WB</b>	World Bank



## **CHAPTER I**

### **1. INTRODUCTION**

Public procurement is the actions taken by each country in line with specific strategies and rules for the continuity of services provided by the state. In relation to the concept of public procurement, it can be mentioned that these purchases should be transparent and accountable and their savings have increasing effects.

However, according to the research conducted by the Organization for Economic Co-operation and Development (OECD) on the public procurement, between the member states, the average of 29% of the total public expenditure in 2011 are the goods, services and construction works made by public institutions and state-owned enterprises (2013, Given the OECD publications, Government at a Glance (pp. 129-130). It can be understood how important the social and developmental impact of public procurement on economic development is.

With about 105 billion of public procurement by 2013, Gross Domestic Product (GDP) about the public procurement for Turkey, which amounted to 7 percent (10th Development Plan), shows how great a potential as economic development in an industrial policy tool. Because, considering the economic history, it is seen that it has increased its national technological capabilities and capacities later; countries such as Japan, South Korea and Germany benefited from the direct impact of public procurement on development.

Coins spent in large amounts should not be supply-oriented, but should be oriented towards development, which will provide the development of national technological capabilities and capacities, which is the most important issue that can build the future of the countries. The development of the public procurement ecosystem with a domestic entrepreneur-friendly structure with the potential to develop advanced technology will create leverage in development. When this happens, small and

medium-sized enterprises will have market access problems, cash flow problems and market holdings despite the pressures of large scale companies.

In order for a country to take place among developed countries, it is necessary to cooperate in coordination with the universities where R & D activities are carried out and the industry, where this information turns into product, value and process; this cooperation can take place with policy tools such as incentive, tariff rates and public procurement. The difference of public procurement is that it does not only provide funding sources such as incentives for infant industries, but also provides a market opportunity for baby industries along with financing.

In short, the mathematics of the work is simple. In a strategic industry according to Alexander Hamilton's baby industry thesis, the costs are high when an industry is newly established. Therefore, there is no possibility to compete with those previously established and developed. However, if this industry is protected from the competition of the foreign market for a certain period of time, it becomes competitive. Because as the volume of production expands, the cost-reducing factors will show the effect and industry will gain experience. Industries with a potential for further development cannot compete with foreign firms if they cannot benefit from the protection of the state when they are first established. In this way, they can be destroyed without the possibility of development. Protection from external competition gives them the opportunity to go beyond the "childhood" phase. Public procurement is one of the fastest and most effective policy tools for developing and developing countries to develop into developed countries.

Our country tried to use public procurement as a policy tool especially with the 10th Development Plan. In order to support domestic production and technology transfer through public procurement, 15% price advantage was applied in favor of domestic products in public tenders.

From the 10th Transformation Plan Priority Transformation Programs 12. It was emphasized that the 15% price advantage application in the introduction of the Public Procurement and Domestic Production Support and Technology Transfer Program did not provide the expected contribution in the selection of domestic products in public procurement.

Considering the entrepreneurial ecosystem of our country, this problem is not considered to be a problem of public procurement the reasons why the 15% price advantage cannot be applied and the need to redesign entrepreneurship ecosystem and public procurement practices are considered to use public procurement as a policy tool. For this purpose, this thesis was carried out in order to determine the problems faced by entrepreneurs who develop technology in the entrepreneurship ecosystem of our country and to find solutions with their language.

From business idea to prototype development, from production to marketing, from sales to after-sales services to export, as a whole, designer thinking approach and public procurement from the eyes of our entrepreneurs have been examined. The problems of 4 different dimensions were classified as public market size, entrepreneurial dimension, size of institutions and system size. Then, The State Supply Office (SSO) was able to find solutions to these problems by using the existing business model. At this stage, The State Supply Office business model was analyzed with Canvas Business Model method.

It has been seen that the existing business model of The State Supply Office does not produce solutions to the identified problems by itself. In order to find solutions to the problems identified with an innovative perspective, the Business Model Innovation and Value-Oriented Development Approach were proposed along with the current business model of The State Supply Office, and a 3-step solution was developed.

With the Techno Catalog Platform, which is in the 1st stage, value suggestions have been introduced to the business models of the entrepreneurs.

The necessity of developing a new point of view in public procurement in order to manage supply and demand with the understanding of technology management of our country has been put forward.

The State Supply Office; it is at the intersection of SME and entrepreneurship policies. Public procurement is nowadays is the only organization that can organize sales, marketing and after sales services. Developing marketing competencies of our entrepreneurship ecosystem with the policies it will develop, it is evaluated that entrepreneurs can reach to their own country's market firstly and develop them by selling, marketing and after-sales services so they can turn to export very strongly.

In particular, this perspective on public procurement with the SSO Techno Catalog Platform will enable all public institutions in the value chain to come together in the sales focus. There is a platform revolution today. Considering the platform approach, which breaks down the classic channel style business models in a very short time, the development and application of the SSO Techno Catalog Platform is considered to be vital for our country's goals.



## **CHAPTER 2**

### **2. PUBLIC PURCHASES**

#### **2.1 Overview of Public Procurement in the World**

Public procurement; is a mechanism that meets the needs of goods and services used by public institutions in fulfilling their basic duties. It also symbolizes the efficient use of public resources by countries. In addition, there are also development functions such as incentives, regional development targets, sectoral developments, promotion of domestic production, support of SMEs and support of entrepreneurship. Same time; There are also functions to provide savings and control in the context of transparency and accountability principles in public expenditures.

In the course of time, there have been changes in the understanding of social state and the understanding of public service. With the privatization, the procurement of many goods and services previously produced by the state bought from the private sector caused public procurement to grow. Public procurement has the opportunity to use the private sector as leverage in development at this point. Recognizing this potential, many developed countries form national public procurement policies in a way to support public procurement savings and economic policies.

In the development process of developed countries, public procurement and central procurement institutions have played important roles. It is seen that the country needs are provided in a timely manner, in a standard way and in a quality way and obtained and managed from a single source in order to produce the largest economic output.

With increasing public procurement rates in the economy, many international organizations are developing proposals on policies and structuring of public procurement. The European Union (EU), the Organization for Economic Co-operation and Development (OECD), the World Bank (WB) and the United Nations (MB) are some of these institutions.

The general technology and social changes seen in economies and their efficiency and productivity problems are seen in public procurement. It is inevitable that the financial services and works required for the realization of the services to be offered by the public institutions will be provided more effectively.

According to the survey conducted by the OECD member states, in 2011, 29% of the total public expenditures were purchases for the goods, services and works performed by public institutions and state-owned enterprises.

With these figures, according to OECD 2011 data, public procurement accounts for 29% of total public expenditure and 13% of Gross Domestic Product (GDP). 2013, OECD publications, Government at a Glance (pp.129-130) In OECD countries, a more efficient procurement policy means a 10% reduction in procurement expenditures, a 2.9% reduction in total government expenditure and a 1.3% in GDP.

The importance of a small reduction in public procurement to the economy is clearly seen. In this direction; many countries around the world, particularly the EU and OECD member countries, realize effective, transparent and fair public procurement processes; has established public procurement plans and strategies in order to provide public needs with a standard quality, fast and reasonable prices.

With these arrangements; market conditions, basic legal frameworks, procurement procedures and ways of benefiting from technological some obligations have been introduced to the parties.

Developed countries around the world have begun to adopt a method that not only focuses on price and quality balance, but also on the promotion of SMEs, promotion of domestic production and environmental factors [1]. Almost 70% of OECD member states (23 of 33 countries) have developed a strategy or policy for the use of public procurement at central level to support SMEs [1].

The existing rules and regulations on public procurement, which are in force at the international level, continue to be updated accordingly.

With the latest updates in 2014 made in European Union Directives;

- The use of e-procurement tools will become mandatory until 18 October 2018 at the latest,
- Within the scope of the turnover restriction clause which was introduced to facilitate SME participation,

As a condition of participation in the tender by the needy institutions; bid for the companies to participate in the tender, no more than twice the turnover limit of the tender price firm,

- Providing the opportunity for suppliers to work together with the needy organization by offering a proposal to develop a new product or service, in order to create innovative ideas through a new method called Innovation Partnership.
- In the European Union and all over the world, there are general trends for central / semi-central purchasing. In the formation of this trend;
- Lower price for goods and services as a result of collective purchase,
- Providing direct access to a large market through the signing of large-scale contracts;
- Reduced staffing and lower staffing costs and easier performance management in procurement authorities.
- Time, labor and resource savings,
- Focus on contract management and cost-effective solution benefits,
- Proper registration and reporting of the purchase contract and transactions,
- administrative controls were effective.

The Republic of Korea, Italy, Finland, France and the UK are some of the most successful applications of central / semi-central purchasing systems in the world [2].

### **2.1.1 Public Procurement: Examples from the World**

Public procurement in many countries around the world; Central Procurement Institutions and Semi-Central Purchasing Institutions are seen to be effective. With these structures, countries produce and implement effective policies that they need from public procurement.

The most effective Central Purchasing Institutions in the world are South Korea, Finland, Italy and France.

#### **2.1.1.1 Republic of South Korea**

In South Korea, public procurement is carried out through a central purchasing institution. In the beginning of 2000s, e-procurement system was developed within the scope of digitalization and e-government projects. In 2003, the United Nations selected the best e-procurement model. The system supported by the innovations introduced by digitalization is supported by improvements in order to be safer and faster. In particular, studies are conducted to keep the data healthy and analyze. [2]

#### **2.1.1.2 Republic of Italy**

The Italian supply system is characterized by a semi-central supply structure.

In 2009, with the e-government services supporting SMEs, the European Institute of Public Administration received the best practice certificate in public services. Green procurement and entrepreneurship are supported.

#### **2.1.1.3 Finland**

In Finland, there is generally a semi-central supply structure and procurement services are carried out through different platforms. Finland is recognized as a successful example of the Scandinavian system. In the country, in line with the strategic goals determined at the national level in recent years; central tendency is emphasized.

#### **2.1.1.4 France**

The French supply system shows a semi-centralized structure. The Central Procurement Body in the country has been operating since 1985. In addition, the State Procurement Office was established to ensure the coordination of all procurement of the ministries within the central administration organization with the regulation introduced in 2009. The procurement of public institutions through the central procurement body ensures that purchases can be made using environmentally sensitive, paper-handling and electronic methods that reduce bureaucracy [2].



### **2.1.1.5 Britain**

While the public procurement services in the UK show a rather diffuse structure, it is seen that the semi-central procurement system is strengthening in the country. Needy institutions and organizations are able to perform their own purchasing activities provided that they are subject to the legislation. In 2010, however, the British government imposed a collective procurement obligation for all non-profit organizations, particularly central government and associated administrations, in order to reduce public spending.

Despite all the differences;

- Widespread and effective implementation of” framework agreements common in all countries,
- Public procurement made using electronic means or electronic means,
- In Exchange; facilitating the transactions, shortening the processing time, reducing the cost, providing transparency in the control of the procurement process through an effective reporting-evaluation system,
- Implementation of a resident e-procurement application,
- Follow-up of corporate policies based on state policy in the procurement of environmentally sensitive products and support for SME activities.
- There is a significant awareness and tendency towards green supply, and the purchase of environmentally friendly goods and services in EU countries,
- In the procurement announcements, separate signs and images have been placed in order to attract the user's attention to the products covered by green,
- Purchasing is considered as a separate area of expertise,
- Nearly none of the institutions pursued a stock policy, no production activities,
- Organizing training activities for personnel and participants for the effective use of the supply system and development of the employee profile,
- As seen in common activities and practices.

## **2.2 View of the Public Procurement in Turkey**

The first regulations on public procurement in Turkey, is based on the prior establishment of the Republic. In the Ottoman Empire, the preconditions of capitalist

relations of production and the first cores of the modern state emerged in the 19th century, together with the development of the modern bureaucracy, together with all the contradictions of the public procurement order, also witnesses the first cores of its formation. However, the concept of procurement as the main mechanism of the public procurement process has a much older and widespread field of practice and a pre-capitalist character [2].

Public procurement in our country shows a dispersed structure. Many institutions and organizations are involved.

Ministry of Treasury and Finance General Directorate of Budget and Fiscal Control Public Procurement Coordination Department; it has been charged with forming basic policies related to public procurement within the framework of general economic policies and strategies by following and evaluating national and international developments in public procurement.

Especially with the Presidency Management Model, changes are expected in these structures. However; The Public Procurement Authority (GCC) acts as a regulatory and dispute solvent in the field of public procurement.

On the other hand, The State Supply Office (SSO), which was established in 1926 as the Directorate of Stationary Office which carries out the Central Purchasing task with structural transformations according to the needs of our country, is located.

The State Supply Office (SSO), which is a State Economic Enterprise with its flexible structure; offers fast, easy, high quality, standard solutions. The State Supply Office, which is renewed in the mission assumed by Turkey according to the changing conditions of our country, is expected to play important roles in the public procurement in the near future of our country.

### **2.2.1 The State Supply Office**

The State Supply Office (SSO) is the public interest of the public institutions and organizations, taking into account the public interest, the efficient use of public resources, wastefulness prevention, the area of material and the quality of the

material required to ensure the maximum extent of the material, transparency, competition, accountability, in line with the principles of procurement and distribution from the domestic and foreign markets, to procure the needs of the public institutions and organizations in order to carry out the central procurement function by providing the procurement or procurement of the needs of the institutions and organizations and the producers or vendors.

The structure and functions of central procurement institutions vary according to historical conditions, country needs, forms of organization, size of public procurement. But;

- Public institutions and organizations do not have to make purchases from SSO,
- Consideration of restrictions on the subject matter and the amount of the purchase and other considerations,

It is difficult to define the current structure and supply system of the SSO as a central purchasing model.

### **2.2.1.1 SSO Vision**

To be an institution that is among the most preferred international procurement institutions with its innovative solutions and practices.

In order to achieve this vision, the corporate, social, sectoral and international perspectives are presented below.

#### **2.2.1.1.1 Corporate Perspective**

- To be the first and most preferred central procurement institution recognized by its current and potential stakeholders,
- To establish and develop a corporate culture that follows the technological developments and innovative practices, which is environmentally conscious and attaches importance to ethical values,

#### **2.2.1.1.2 Corporate Perspective**

- To be the pioneer of a cultural change and transformation from the understanding of exhausting all resources to the most appropriate procurement concept in order to provide the highest savings in terms of resource utilization in public procurement,
- To contribute to the development of environmental awareness on a social scale; prioritizing the supply of environmentally friendly products,

#### **2.2.1.1.3 Sector Viewpoint**

- Contributing to the development of the product and supplier portfolio in terms of quantity and quality, encouraging the participation of more SMEs in the procurement process, supporting domestic production and thus creating a sustainable competitive environment,
- To anticipate the public's demand by keeping up with sectoral trends in line with customer expectations so that the products and services required by the public in the future can be supplied at the right time,
- To train qualified personnel to the purchasing units of public institutions with our experience and knowledge,

#### **2.2.1.1.4 International Perspective**

- To be an institution which is one of the leading central procurement institutions in the international scale.

#### **2.2.1.2 SSO Historical Development**

In Turkey, the "provision of stationery and other material needs" and "supply of printed paper and the regulation of working conditions of public printing" the beginning of work on can be traced back to 1926. Historical development of SSO;

1. The Chief of the Stationary Office (1926-1933)
2. Stationery Directorate (1933-1944)
3. General Directorate of State Paper and Printing (1946-1954)
4. The State Supply Office (1954 to present)

## The State Supply Office

The new The State Supply Office prepared for the purpose of adapting to the developing technology, expanding the goods and services offered and maintaining its activity more effectively, was put into effect after being published in the Official Gazette dated 04.05.2007 and numbered 26512. The SSO is still operating in accordance with this Statute [2].

Main areas of activity;

- Lighting devices and heating-cooling devices, except fixed installations,
- Package software, except office automation, with office machines, information technology products, other machines and tools,
- Printed forms, types of declarations and declarations,
- Cleaning tools and equipment with various cleaning materials,
- All kinds of stationery and office supplies and furnishing,
- Paper, cardboard, cardboard and their products,
- The common use of public institutions and organizations from other flooring, fixtures, machinery and equipment,
- Vehicles and construction equipment (including bicycles), their internal and external tires, fuel and batteries, vehicle and construction machinery leases,
- Travel and transportation services,
- Collective medicines and medical supplies,

### **2.2.1.3 Structure of SSO**

The structure of the SSO is regulated in Article 5 of the Main Statute.

According to this; SSO is a State of the Economic State with a legal personality, autonomous in its activities and limited by its capital. It is subject to the provisions of private law without prejudice to the provisions of Decree Law No. 233 (Decree Law) and Main Statute. The center is in Ankara. The ministry is related to the Ministry of Treasury and Finance.

The organs of the General Directorate of State Materials Office; The Board of Directors and the General Directorate are kind. The Board of Directors takes all necessary decisions regarding the realization and management of the objectives and

activities of the Organization. The provisions of Decree Law No. 233 on the establishment, duties and authorities of the Board of Directors and the appointment of Board members, their qualifications and terms, terms of office, dismissal and other related matters shall be applied.

Headquarters; It consists of the Central and Provincial Organization. Central Organization: seven Main Service Units, three Advisory and Audit Units, three Auxiliary Services unit.

#### **2.2.1.3.1 Main Service Units**

- No. 1 Purchasing Department
- No. 2 Purchasing Department
- No. 3 Purchasing Department
- Department of Catalog
- Department of Marketing
- Department of Accounting
- Quality Control Department

#### **2.2.1.3.2 Advisory Units**

- Legal Consultancy
- Department of Strategy Development
- Board of Inspectors

#### **2.2.1.3.3 Utility Units**

- Department of Support Services
- Department of Human Resources
- Computer Center

On the way.

In addition, seven Regional Directorates of the Provincial Organization (Istanbul, Izmir, Bursa, Trabzon, Eskisehir, Gaziantep, Elazig), four Liaison Office (Diyarbakir, Erzurum, Mersin, Van) and consists of one Printing Operations Directorate [2].

## **CHAPTER 3**

### **3. TECHNOLOGY TRANSFER OVERVIEW AND TECHNOPARK**

#### **3.1 Technology Transfer Overview**

One of the most important factors that provide social, economic and technological development of societies is the progress in scientific and technological developments. Knowledge has gained itself a great place in every period of humanity. The Turkish Language Association defines knowledge as real obtained through learning, research or observation. Science is also making progress with knowledge.

Today, societies focus on science in every field. And it produces economic value by transforming science into product, value and process. And this transformation is quite fast. It has become the most important force in the social and economic race of the countries. Labor, capital, raw material, science and technology are added to production. Technology transfer; a new technology created by an institution or business is to enable the use of this technology to be successfully presented to a few institutions or businesses.

Today R & D is vital for societies and businesses. However, the real success combines theory and practice. In other words, it is possible to convert the produced information into products and services by using it in a way to produce value in the market.

However, only technology transfer does not provide continuity. Especially in today's scientific developments, information production has accelerated tremendously. As a result, technologies are void in a very short time. This is not only a competitive opportunity for companies and companies that transfer technology.

If countries and companies want to dominate the global markets and want to have a voice, they should develop value-added technologies and move forward with innovations.

R & D should be given more importance. Today, developed countries are devoting a significant portion of their gross national product to R & D. They are encouraging, facilitating R & D. Global companies are devoting significant R & D budgets to maintain a competitive advantage.

Science and technology are two intertwined concepts. The process that affects each other can be expressed as follows:

- Science gives rise to technology,
- Science uses the technology it has produced to produce more science,
- More science produces more technology [3].

Technological superiority has not only improved economic and social welfare. In particular, today, countries are using critical technologies as a source of political power. If a country is not technologically independent, it is under serious threat from multiple points.

The countries that have grasped this serious importance of technology have entered into a non-tolerant technological war in recent years and have started to disrupt the balances in their favor by accelerating the competition in international markets.

Technology transfer operates in a system that is leading to technology production, from their companies to developing countries and their companies.

Developing countries that cannot determine and produce the technology they need, however, tend to supply these technologies only legally or illegally through transfer. However, technology transfer is not just a process from developed countries to developing countries. Developed countries carry out very serious technology transfer and trade among themselves.

Freeman and Soete (1997) emphasize the accuracy of the expectation that the vast majority of new technologies will be born in the advanced countries, but argues that



the new technology can spread faster in a country that does not know the past, has not invested in it, and has not (and probably has been) developed [4].

Technology transfer, which is not only for the underdeveloped or developing countries, but also for developed countries, means economics to increase productivity and to import the technology needed from the technology producing countries to achieve economic growth and development [5].

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The need for technology transfer is based on different reasons depending on the level of development of the countries. Some developing countries are engaged in technology transfer in order to compete with developed countries due to lack of sufficient manpower and capital.

In addition, it is possible to mention the reasons such as making the existing facilities more modern and increasing the profitability.

The reasons that are effective in the export of technology, companies that are based on technology production to meet their expenses by selling the technology and to make a profit, to sell an investment goods or semi-finished products to disseminate

the sale of technologies that use them, companies that use new technologies to make profit by selling the old technologies, goods The sale of technology (or license, know-how and patent) in order to sell semi-finished products to the markets that are difficult to sell can be expressed as providing additional profit by selling the technologies that are spreading [6].

The main objective for the parties making technology exports is profitability whereas the main target for the importing party is' gaining development and competitiveness [7]. Technology transfer; application, production, adaptation, assimilation, such as the processes involved in many complicated processes are carried out within the framework of certain methods [8].

### **3.1.1 Technoparks in the World**

The idea of Technopark first emerged in the United States in the early 1950s (source 9). Founded in Stanford in the early 1950s, the park is known as the Silicon Valley Today, hundreds of global companies such as Google, Intel, Adobe Systems, Yahoo, VeriSign are located in this technopark. The technocords led by Silicon Valley are the big centers where innovative thinking is transferred to practical life all over the world today. Today, approximately 1,000 technoparks are active in the world [9].

With the contributions of international organizations such as United Nations Development Program (UNDP), United Nations Science and Technology Development Fund (UNFSTD), United Nations Industrial Development Organization (UNIDO), International Labor Organization (ILO) and these countries include China, India, Chile, Mexico, the Philippines, Gabon, Nigeria, Zimbabwe and the Caribbean (Jamaica, Guyana, Barbados) [10]. The technology program implemented in China is one of the most successful examples of programs implemented in developing countries. The program, which was initiated with the contributions of international organizations such as UNDP, UNFSTD and in cooperation with the State Science and Technology Commission (SSTC), resulted in the establishment of 12 techno-cities in different regions of China. This program is part of the program, which is known as TORCH, which aims to train 2,000 new

entrepreneurs and 20,000 business executives in the field of advanced technologies [11].

The work, initiated in Poland in 1989, resulted in the establishment of the Wielkopolska Innovation Center in 1990. The center is supported by local government, industry trade and artisan chambers and the Wielkopolska Economic Association [12].

### **3.1.2 Overview of Turkey in Technology Transfer**

Our country has positioned itself as an agricultural country for many years. It has made progress in the field of industry in our country with scientific developments and industrial policies. The fact that we have a voice in global competition over time can only happen with technological innovations. In this process, the establishment of technopark has come up.

In order to provide the development of technology-based firms, to provide them with services at certain levels, to help them to increase the technological level of such innovative companies, to commercialize academic knowledge, to ensure the transfer of the results of science and technology to the industry, and to improve the university-industry relations [13].

In Technology Development Zones established by Law No. 4691 published in 2001; production of technological knowledge, commercialization of the information produced, product quality and standard in the product and production methods, improvement of the innovations that will increase productivity and reduce production costs, ensure the adaptation of small and medium-sized enterprises to new and advanced technologies, provide job opportunities for researchers and make advanced technology investments. to increase the competitiveness of the industry with the acceleration of entry into the country.

Turkey's establishment of techno parks projects in industry, commerce, science and technology strategies that benefit is determined as follows:

- Establishing industries based on competitive potential within the world market and technology that is strategically important in the domestic market,
- Promote internal investments and foreign capital investments,

- Establishing effective links between universities, public and private sectors,
- Promoting and developing export products with higher added value, especially for domestic raw materials, skilled labor and capital,
- Investing in advanced technologies with high economy returns and indirectly increasing employment,
- Improving product quality and productivity through advanced technical and training applications,
- Transfer of university research results to industry. [14]

### 3.1.3 Technopolis in Turkey

Within the scope of Technology Zone Law, which will enable us to develop new products and production methods for technological production by bringing together our industrialist, researchers and universities which have been implemented since 2001; By the end of December 2018; Eighty-one Technology Development Zones (nine in Ankara, eleven in Istanbul, five in Kocaeli, four in İzmir, two in Konya, two in Gaziantep, two in Antalya, two in Mersin, two in Kayseri, Trabzon, Adana, Erzurum, Isparta, Eskisehir- (Bilecik), Bursa, Denizli, Edirne, Elazığ, Sivas, Diyarbakir, Tokat, Sakarya, Bolu, Kutahya, Samsun, Malatya, Urfa, Düzce, Canakkale, Kahramanmaraş, Tekirdağ, Van, Çorum, Manisa, Niğde, Burdur, Yozgat, Kırıkkale, Balıkesir, Hatay, Karaman, Muğla, Afyonkarahisar- (Uşak), Aydın, Batman, Osmaniye, Zonguldak, Karabük, Nevşehir, Çankırı, Kastamonu and Kırklareli one each) it were established.

Sixty-one of the eighty-one Technology Development Zones continue their activities and twenty of them have not started to operate due to the continuation of infrastructure works.

According to this, seven of the Technology Development Zone operating in Ankara, six in Istanbul, four in Kocaeli, four in İzmir, two in Konya, two in Gaziantep, Antalya, Kayseri, Trabzon, Adana, Erzurum, Mersin, Isparta, Eskisehir, Bursa, Denizli, Edirne, Elazığ, Sivas, Diyarbakir, Tokat, Sakarya, Bolu, Kütahya, Samsun, Malatya, Şanlıurfa, Düzce, Çanakkale, Kahramanmaraş, Tekirdağ, Çorum, Van, Kırıkkale, Yozgat, there are one in Afyon, Niğde, Manisa, Aydın, Burdur and Zonguldak.

Two units in Ankara, Istanbul five units, Balıkesir, Hatay, Karaman, Mugla, Batman, Osmaniye, Karabuk, Antalya, Nevsehir, Kocaeli, Mersin, Cankiri, Kastamonu and Kırklareli one Technology Zone has not yet started to operate. Bilecik and Uşak are not operational as additional sites.)



## **CHAPTER 4**

### **4. VIEW OF DEVELOPMENT PLANS**

#### **4.1 First Five-Year Development Plan (1963-1968)**

Turkey is among the countries forming in the first place for institutions required for development planning and policy development. In the 1961 Constitution, the State Planning Organization (SPO) took part.

The first five-year plan came into force in 1963. This period of scientific activities in Turkey as a role in directing the Scientific and Technical Research Council of Turkey (TUBITAK) was established. And in the first years of technology handling, science and technology policies carried out by TUBITAK were carried on in a consensus with the government without any official documents. During this process, R & D has been in the forefront and studies have been carried out in order to establish the R & D infrastructure, to establish R & D facilities on public basis and to ensure that the academic environment catches the basic values and determinants of R & D logic.

#### **4.2 Second Five-Year Development Plan (1968-1972)**

In the Second Five-Year Development Plan, the subject of science and research took place independently of the developments in technological development, industrialization and economic sectors. The importance of manpower is emphasized for the continuation of the systematic research and development process.

#### **4.3 Third Five-Year Development Plan (1973-1977)**

In this period, it is difficult to say that an integrated relationship has been established between technological development and development goals and objectives, social and cultural structure, international relations and domestic resources.

The Third Plan also made important and concrete determinations such as the fact that the necessary institutional mechanisms to manage the technological information flow and the necessary infrastructure for the production of technology in the country,

which would make the decisions on technology transfer and which would enable the technological inventions to be associated with the industry. During this period, in order to strengthen the manufacturing industry in the country, importance was given to the establishment of machinery manufacturing industry, electronics industries, petrochemical industries and engine factories.

#### **4.4 Fourth Five-Year Development Plan (1979-1983)**

For the first time, technology policies have been mentioned, technology policies should be considered together with industry, employment and investment policies as a whole and certain sectors are developed to produce their own technologies.

The most important development of this period is the publication of the Turkish Science Policy 1983-2003, which is the first scientific policy document of our country.

Science and Technology Supreme Council (STSC) together was established with the aim of conducting research and development in the field of science and technology, orientation and coordination in line with economic development, social benefit, social and cultural development goals.

#### **4.5 Fifth Five -Year Development Plan (1985-1989)**

In this chapter; A Science and Technology Plan will be prepared in accordance with the long-term plan, objectives and strategies and the economic, industrial and social objectives of the country.

During the Fifth Five-Year Development Plan, importance was given to the issue of export. It is emphasized that the share of industrial products in exports should increase. It has been emphasized that the current industry sees the need for technology through technology transfer, thus increasing dependence on the outside and not the desire to make scientific and technological research.

Nevertheless, a policy expressed for the first time in the Fifth Plan was to intensify the infrastructure facilities of R & D resources in favorable research institutions in order to promote university-industry cooperation, to specialize in the areas where universities are strong and to create attraction centers. This policy has been significantly implemented, especially in the last two plan periods.

#### **4.6 Sixth Five-Year Development Plan (1990- 1994)**

In this period, the Turkish Science and Technology Policy: 1993-2003 Science document, which forms the basis of the Science and Technology Policy of our country, as accepted.

The main purpose of Turkish Science and Technology Policy is to bring the country to the level of advanced countries in terms of science and technology between 1993 and 2003, in other words, to keep up with world technology.

Some priority technology areas have been identified. Some of those; Informatics (a combination of computer, microelectronics and telecommunications technologies), High-tech materials, Biotechnology, Space technology and Nuclear technology are mentioned. It is to be taken by Turkey in 10 years, and contain targeted data are determined to water:

- The number of investigators to ten thousand employees
- R & D expenditures share 1% of GNP,
- In terms of contribution to the science of Turkey in the world rankings 30's.
- The share of R & D expenditures of private institutions in the country R & D expenditures is increased to 30%.

In the Sixth Plan period, the establishment of techno parks was encouraged and expanded. One of the most important developments of this period is the establishment of SMEDO for the development and support of small and medium sized industry.



#### **4.7 Seventh Five-Year Development Plan (1996-2000)**

The most important emphasis of this period is that it is aimed to catch the age by taking advantage of globalization at the highest level and to take a distinguished place among the developed countries of the world.

In this period, when the developments in the world are closely monitored, the technological development of the countries; In this context, it is aimed to encourage the cooperation between university and industry and accordingly to establish new mechanisms such as techno parks, innovation centers and R & D centers.

In order to transform the society into an information society and establish the R & D infrastructure; it was emphasized that the need to allocate more resources to R & D activities.

#### **4.8 Eighth Five Year Development Plan (2001-2006)**

In this plan, the ability to upgrade Turkey's science and technology, in becoming a judge emphasized that it is the only strategic option.

Eighth Plan, the vision of Science and Technology policy; "Science and confident to produce technology, science and technology and economic conversion social benefits (innovation) have gained the skills, the countries contributing to the world of science and technology between to create a Turkey with dignity." Within the framework of this vision, the establishment of the National Innovation System stands out. In the Eighth Plan, it is aimed to increase the scientific and technological researches that provide economic and social development and to improve the physical, human and legal infrastructure. It has been stated that joint R & D initiatives of the university-public-private sector will be encouraged and supported.

#### **4.9 Ninth Development Plan Period (2007-2013)**

The Ninth Development Plan, covering the period of 2007-2013, was implemented in the period of intense competition with rapid and multi-dimensional change. So the plan, Turkey's economic, demonstrating a breakthrough policy should do in social and cultural fields documents.

During this Plan period, activities of Technology Development Zones, Technology Centers, university-industry joint research centers continued to be supported. It has been decided to establish a structure for the specialization of software activities in the techno parks to support regional and priority industries.

In the Ninth Plan Period, it is seen that R & D and innovation are given great importance. On this plan;

- R & D activities are designed to produce innovations and to be market oriented, share of R & D expenditures in GDP and increase the weight of private sector in expenditures.
- Venture capital and so on, it is said that the establishment of research institutes and / or centers will be encouraged to disseminate the formations and to carry out R & D and innovation studies in the priority areas of the private sector.

It is stated that the R & D activities supported by the universities should be in a way to contribute to the economic, social and cultural development of the country. In order to provide these, it is necessary to increase the culture and awareness of science, technology and innovation.

High emphasis was given to qualified researcher manpower, which is the cornerstone of R & D. This manpower, especially in universities, will be supported by the private sector for the development of university-industry cooperation.

The infrastructure of the techno parks, which serve as a bridge between the universities and the industry, will be encouraged and their infrastructure will be strengthened.

In this way, it is aimed to transfer the knowledge to industry and production, and to enable universities to benefit from the experiences of industry.

- Arrangements were made to make effective implementation of the national innovation system.
- As generic technologies for the future; biotechnology, nanotechnology, nuclear technologies and hydrogen and fuel cell technologies; research in the sectors in which science and industrial policy will prioritize; R & D activities aimed at Turkey's ability to convert resources into value added; health research; information technologies and defense and space technologies are identified as priority areas.
- In addition to this, it was decided to carry out cooperation activities in the fields of science and technology with the advanced countries in order to transfer information and technology.

#### **4.10 10th Development Plan Period (2014-2018)**

Priority Transformation Programs prepared in line with the 2023 targets were marked by the Tenth Development Plan.

These programs are aimed at achieving targets known as 2023 targets. For this purpose, critical reform requiring effective coordination and cooperation between institutions, which is important for achieving 2023 targets and the objectives of the Tenth Development Plan and which can contribute to the transformation process and which can contribute to the transformation process.” Priority Transformation Programs are carried out for the areas.

It is observed that public procurement has been emphasized for the first time in such a clear and intensive way. Especially with public procurement; It is aimed to support innovation, indigenusness, entrepreneurship and technology transfer.

In this context, especially 3 Priority Transformation Program;

- 12. Program for Technology Development and Domestic Production Support through Public Procurement
- 11. Commercialization Program in the Priority Technology Areas

- 16. Structural Transformation Program in Health Industries'

#### **4.10.1 Twelfth Technology Development through Public Procurement and Domestic Production Support Program**

##### **4.10.1.1 Purpose and Scope of the Program**

When we look at the program, the first conspicuous public procurement is that countries have a significant share in GDP. In Turkey, public procurement, which was realized as approximately TL 94 billion as of 2012 and 7% of GDP, constitutes an important opportunity for our country to contribute to R & D and innovation efforts.

The most important legal arrangement to support domestic production in public procurement, and in the Public Procurement Law, the price advantage up to 15 percent in favor of domestic bidders has not been able to contribute to the growth of public procurement technology transfer or the development of industry.

In developed countries, public procurement is used as a policy tool to support domestic production and technology development in a dense manner.

With the adoption of approaches that will contribute to R & D and innovation activities in public procurements, the cost of products produced in the country can be reduced, imported products can be produced domestically and the efficiency of domestic companies in export markets may increase. With this program, public procurement; It is aimed to regulate innovation, localization, technology transfer and innovative entrepreneurship.

Observation of domestic R & D and innovation contribution in public procurement and utilization rights; encouraging innovation, localization and technology transfer; it is envisaged that international direct investments will be increased through policies to be implemented in public procurement.

##### **4.10.1.1.1 Program Goals**

- Increasing the share of domestic firms in the medium-high and high-tech sectors in public procurement

- Supporting the international branding process in high-tech sectors and increasing the number of branded products
- Increasing R & D expenditures through public procurement system
- Improving international direct investments through policies to be implemented in public procurement

#### **4.10.1.1.2 Performance Indicators of the Program**

- Share of domestic production in public procurement
- The share of SMEs in public procurement
- The share of domestic procurement based on public procurement guarantee in total purchases
- The share given to the domestic industry through offset application in foreign purchases
- Number and amount of offset agreements

#### **4.10.2 Eleventh Commercialization Program in Priority Technology Areas**

##### **4.10.2.1 Purpose and Scope of the Program**

Although significant progress towards R & D activities are increasing and disseminating in Turkey together with the new technological product manufacturing process dating back to the launch of products starting from basic research it is particularly needed to improve the commercialization of. In this sense, it is critical to establish brands with international competitive, new intermediate or final technological products through the commercialization of R & D and innovation activities.

With this program, it is aimed to reveal the internationally competitive technological products and brands in the sectors that are important for the country. In this context, priority sectors will be energy, health, aviation and space, automotive and rail systems and defense, and sub-programs will be created to provide the final product and benefit in these sectors.

#### **4.10.2.1.1 Program Goals**

- Increasing the number of technological products and brands in priority sectors
- Increasing the share of priority sectors in manufacturing and export of manufacturing industry
- Training qualified researchers and increasing their employment in the private sector
- Increasing research centers, incubators, accelerators, technology and innovation centers
- Making Technology Development Zones (TGB) sector-oriented
- Development of innovative entrepreneurship
- Increasing technology transfer interfaces

#### **4.10.2.1.2 Performance Indicators**

- Number of new products, brands and patents
- Number of Ph.D. researcher
- Number of accredited research, measurement and test centers
- The share of priority sectors in manufacturing and export of manufacturing industry
- Number of clusters in priority sectors
- Number of entrepreneurs
- Number of technology transfer offices, number of companies served by offices, license revenue of offices

### **4.10.3 Sixteenth Structural Transformation Program in Health Industries**

#### **4.10.3.1 Purpose and Scope of the Program**

Increasing and aging population in our country, increase in life expectancy, health services and improvement in drug access, increased welfare level and awareness of the demand for medicines and medical devices due to factors such as increase in social security expenditures and current account deficit.

Long term, Turkey is a global pharmaceutical R & D and production center in the field of pharmaceuticals and medical devices is important to reach a competitive position. With this program, it is aimed to switch to a production structure capable of producing high value-added products, providing products and services to global markets and meeting a larger part of the need for domestic pharmaceuticals and medical devices.

In this context, it is foreseen to increase the efficiency of global value chains by increasing the capacity of domestic production in the medium term, developing R&D and intervention ecosystems, developing a new molecule in the long term, producing a higher value-added drug and medical device.

#### **4.10.3.1.1 Program Objectives**

- 20% of domestic medical equipment and medical supplies are met with domestic production
- 60% of domestic pharmaceutical needs are met by domestic production

#### **4.10.3.1.2 Performance Indicators**

- Imports ratio of exports to pharmaceuticals and medical devices
- Share of R & D expenditures of pharmaceuticals and medical devices in GDP
- Number of domestic and international applications for the pharmaceutical sector
- The number of medical device companies in Turkey
- Number of employees in the pharmaceutical sector
- The number of new drugs started to be produced in Turkey

## **CHAPTER 5**

### **5. CANVAS BUSINESS MODEL**

Canvas Business Model is one of the most common business model development tools used by entrepreneurial ecosystem as a business model development tool. Canvas Business Model was used during the study because it allows the visualization of both the simplicity of the work and the business model, and the smallest changes to be made in any part of the business model.

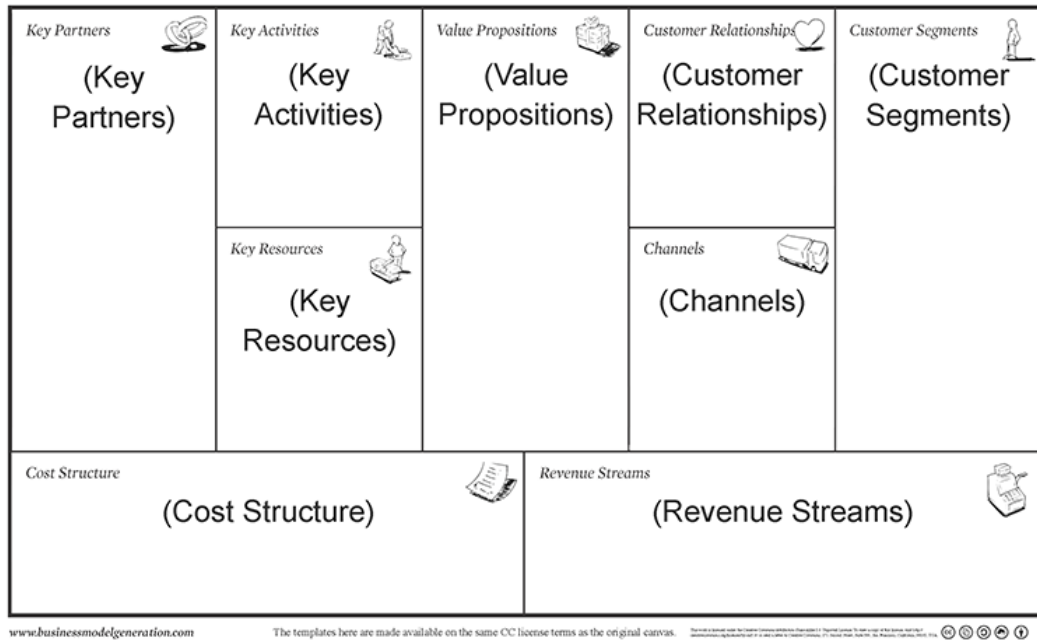
#### **5.1 Canvas Business Model**

Canvas Business Model; Developed in 2009 by Alex Osterwalder Business Plan preparation tool. In the business idea, the fact that it has everything to be seen on a single page and can be simply applied and interpreted in a simple way increases its usability. Furthermore, the Canvas Business Model took a big share in the Lean Entrepreneurship movement, which was headed by Eric Ries. Canvas Business Model, tourism, health, energy, textile, automotive, technology, logistics etc. It provides the opportunity to be applied easily to the planned business ideas.

##### **5.1.1 Preparation of Canvas Business Model**

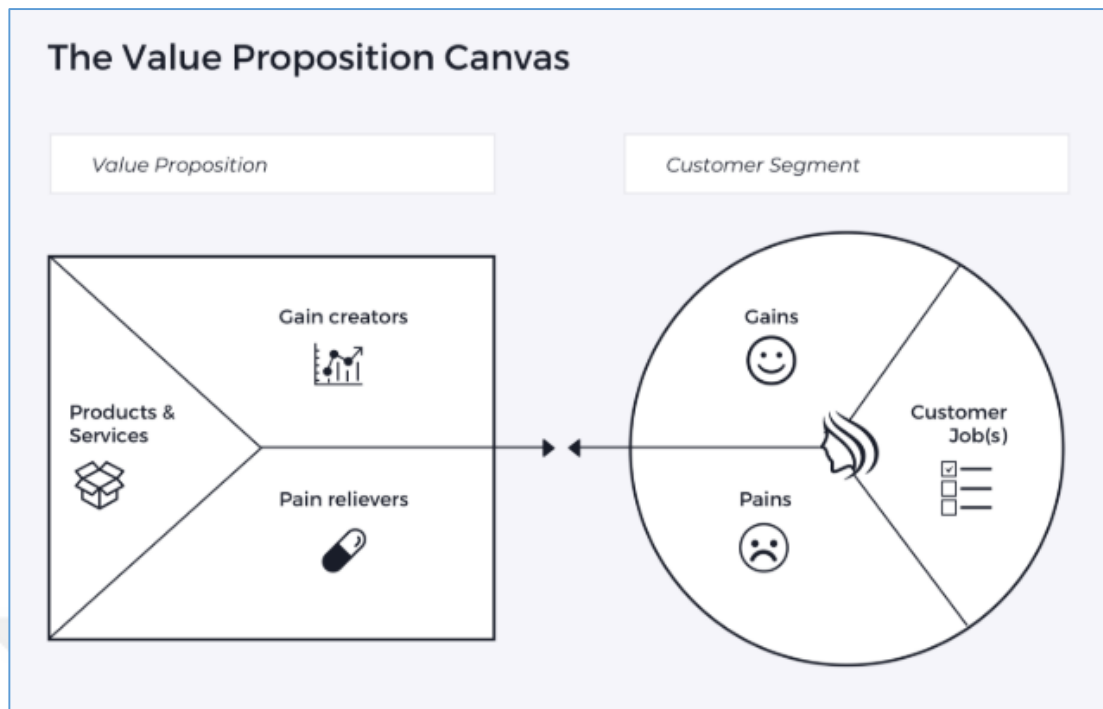
For the Canvas Business Model, there is a Business Model table developed by Osterwalder. This table is a strategic and entrepreneurial tool that allows start and current firms to develop a business model. [16]. Canvas is a visual presentation of the concept that actually fits the whole strategy. Thus, it was facilitated and prepared so that the users of the model could easily fill the table and examine the strategic decision-making processes [16]. As can be seen from the Business Model Table in Figure 1, there are two sections, right and left, in the table. The left-hand side is concerned with the creation of supply, production and value where the right side of this value is delivered to the customer [16].





**Figure 5.1** Canvas Business Model Canvas

Although the table was recently developed, innovations were added to it. The value proposition is at the center of the table and it is seen that there are difficulties in explaining the concept of value. For this reason, a new table called the value proposition table given in Figure 5.2 has emerged [16]. However, this study was done according to the table shown in Figure 5.1



**Figure 5.2** Design of Value Proposition Canvas

There are 9 sections in the Business Model table. These sections are as follows.

1. Customer Segments
2. Value Proposition
3. Channels
4. Customer Relations
5. Income Flows
6. Basic Resources
7. Basic Activities
8. Basic Partnerships
9. Cost Structure

#### **5.1.1.1 Customer Segments**

Customer segments indicate the different people, organizations, or groups that an organization aims to reach and serve. The heart of all business models is the customer. A profit-making company cannot stand if it has no customer. Companies to satisfy the customer in the best way; should segment into segments based on common needs, behavior or other common characteristics. A business model can identify one or several large or small customer segments [16].

Organizations need to decide which segments to address and which ones they will not be interested in. Once this decision has been made, the business model can be carefully created around specific customer needs [16].

Customer segments can be diverse. For this we can ask the following questions while preparing the Business Model.

- Who are we creating value for?
- Who are our most important customers?

A few examples are given to customer segments; mass market, niche market, segmented market, diversified market, multilateral markets [16].

#### **5.1.1.2 Value Proposition**

The Value Proposition section refers to the product and service packages that create value for the designated customer segment. Value Proposition is the reason why customers prefer one company to another. Therefore, the Value Proposition can be explained as the sum of the benefits a company offers to its customers [16].

Value Recommendations may be an innovative product or may be offered after additional features have been added to the existing product.

The following questions can be examined while preparing the Value Proposition.

- What value do we offer to the customer?
- What problems do we address our customers?
- Which customer needs do we meet?
- What product and service packages do we offer to customer segments? [16]

A value proposition creates a value for that segment by incorporating elements that meet the needs of a customer segment. Values can be presented as qualitative (customer experience, design etc.) or as quantitative (price, service speed, etc.). Some elements can be considered when creating the value to be offered to the customer. These elements can be sorted as follows [16].

- Innovation

- Accessibility
- Ease \ comfort
- Cost reducing
- Risk reduction
- Price
- Getting the job done
- Design
- Brand \ status
- Personalization
- Performance

### **5.1.1.3 Channels**

The Channels section describes how an organization can access and communicate to the Customer Segment that it wants to present its Value Proposition. Sales channels, communication, distribution create the interface between customers of a company. Channels are contact points that play an important role in the customer experience.

Some of the functions served by the channels are:

1. To raise awareness on the customer's products and services,
2. To assist customers in evaluating a company's Value Proposition,
3. To ensure that the customer purchases certain products and services,
4. Presenting a Value Proposal to the Customer,
5. To offer customer support after purchase [16].

The following questions can be asked when creating channels:

- Which channels should we access to our customer segments?
- How do we reach them now?
- How are our channels integrated?
- What are the best functioning channels?
- Which ones are most cost-effective?
- How do we integrate these with our customers? [16]

Find the correct channel mix; Bringing Value Proposition to the market is of great importance in how to reach customers and create customer satisfaction. An organization can use its own channels or partners' channels to reach a customer and develop a new formula by combining two alternatives. The importance of the job is to establish the right balance between different Channels, to create a large customer satisfaction and to integrate these Channels to maximize revenues [16].

#### **5.1.1.4 Customer Relationship**

The Customer Relations Department explains the types of relationships an organization establishes with certain Customer Segments. The organization shall establish each relationship separately and clearly according to each Customer Segment. Customer relationship; customer recruitment, existing customer retention and sales can be shaped by increasing techniques.

The following questions may be addressed when establishing Customer Relations:

- What kind of relationship do our Customer Segments expect us to maintain and maintain?
- What relations have we established before?
- What is the cost?
- How can they be integrated with the rest of our business model?

There are various categories of Customer Relations that can be found simultaneously in the relationship between an organization and a designated Customer Segment, and can be listed as follows:

- Personal assistance
- Personalized assistance
- Self-service
- Automatic services
- Joint investment
- Communities [16]

### **5.1.1.5 Income Flow**

The Revenue Stream section is the cash that an organization earns from each Customer Segment.

The Income Flow in a business model can be divided into two:

1. Transaction income from customers' purchases only once,
2. Recurring revenue from continuing payments to provide Customer with a Value Proposition or post-purchase support.

The following questions can be examined for Income Flows:

- What is the value our customers are willing to pay?
- What values do they currently pay for?
- In what way do they pay?
- In what way do they prefer to pay?
- How much does each Income Flow contribute to total revenue? [16]

### **5.1.1.6 Basic Resources**

The main resources section refers to the most important assets required for the continuity of a business model. Fundamental Resources are the basis for an organization to create and present a Value Proposition, to reach various markets, to maintain ties with Customer Segments and to generate revenue.

Basic Resources can be categorized as follows:

- Physical
- Intellectual
- Humanities
- Financial

For Basic Resources, the following questions can be discussed:

- What Basic Resources do we need?
- What are our Sales Channels?
- What is our customer relationship?
- How is our income flow? [16]

### **5.1.1.7 Basic Activities**

The Basic Activities section refers to the most important things that an organization has to do to operate the business model. Each business model is based on some Basic Activities and is the most important activity required for the successful continuation of the company. Basic Activities; Creating and presenting a Value Proposal is necessary to reach different markets, keep Customer Relations alive and generate revenue.

Basic Activities may vary depending on the type of business model. For example; The software manufacturer covers basic software development for Microsoft. For the PC manufacturer Dell stands for supply chain management, while for the McKinsey consulting firm it involves problem solving.

The following questions can be discussed for the Basic Activities:

- What Basic Activities do we require?
- What are our distribution channels?
- How are our Customer Relations?
- How is our income flow?

Basic activities can be classified as: Production, Problem solving, platform management, continuous improvement.

### **5.1.1.8 Basic Partnerships**

Basic Partnerships; refers to the network consisting of suppliers and partners providing the operation of the business model. In order to improve business models, mitigate risks or acquire new resources, companies deal with other companies. A total of four different types of partnerships can be mentioned. These:

- Strategic alliances established with non-competitive companies,
- Strategic partnerships established between competitors,
- Joint ventures established to develop new works,
- Buyer-seller relations established in order to avoid problems in procurement.

The following questions can be addressed for the Basic Partnerships:

- Who are our main partners?
- Who are our main suppliers?
- What Basic Resources do we receive from our Company?
- What Basic Activities does our company perform?

3 motivations to establish a partnership can be mentioned. These:

1. Optimization of economies of scale,
2. Reduction of risk and uncertainty,
3. Acquire certain resources and activities [16].

#### **5.1.1.9 Cost Structure**

Cost Structure is the most important cost of using a particular business model. Creating and presenting value, keeping customer relations fresh, generating income are cost-generating activities.

The following questions can be discussed for the Cost Structure:

- What are the most important costs in our business model?
- Which are the most cost-effective basic resources and activities?

One of the objectives in each prepared business model is to minimize costs. From this perspective, it becomes easier to see two main categories in Cost Structures. These are cost-driven and value-driven business models.

**Cost-driven Business Models:** Cost-driven business models are based on minimizing costs whenever possible.

**Value-driven Business Models:** Value-driven business models, some companies do not care much about the cost effects of a business model design. Instead, they focus on creating value.

The characteristics of the cost structures are fixed costs, variable costs, economies of scale and economies of scope [16].



## **CHAPTER 6**

### **6. OTHER METHODS USED**

In order to develop an innovative business model, the Canvas Business Model is used to analyze the current business model and to develop the new business model. However, in order to develop a new business model most of the time, the root causes of the problem should be addressed. Understanding the reasons for the root causes of problems is often not enough to develop an innovative business model. At this stage, in order to understand the problems on the one hand and to design a solution, Design Oriented Thinking Method is used. With this method called Design Thinking, solutions are designed on the one hand. However, there is a need to create a common language among different stakeholders and ecosystems and to manage innovation through a systematic method. This need is also answered by the Technology Preparatory Level Method developed by NASA.

#### **6.1 Design-Oriented Thought Method**

Design-Focused Thinking is a special problem-solving technique used to understand the user-problem owner in order to identify alternative strategies and solutions that are not visible at the first time, to combat assumptions and to redefine problems.

Design-oriented thinking also offers a solution-oriented approach to solving problems. It is a method of thinking and working supported by practical methods. Design-driven thinking supports the development of an understanding of people who have designed products or services for themselves.

What is specific to design-oriented thinking is the working processes of designers; in business, in countries, in our lives - to solve existing problems with a productive and innovative approach to help these techniques in practice. Helps the user to observe and empathize with the target user. Design-oriented thinking also helps in the questioning process: questioning the problem, questioning assumptions and questioning the results.

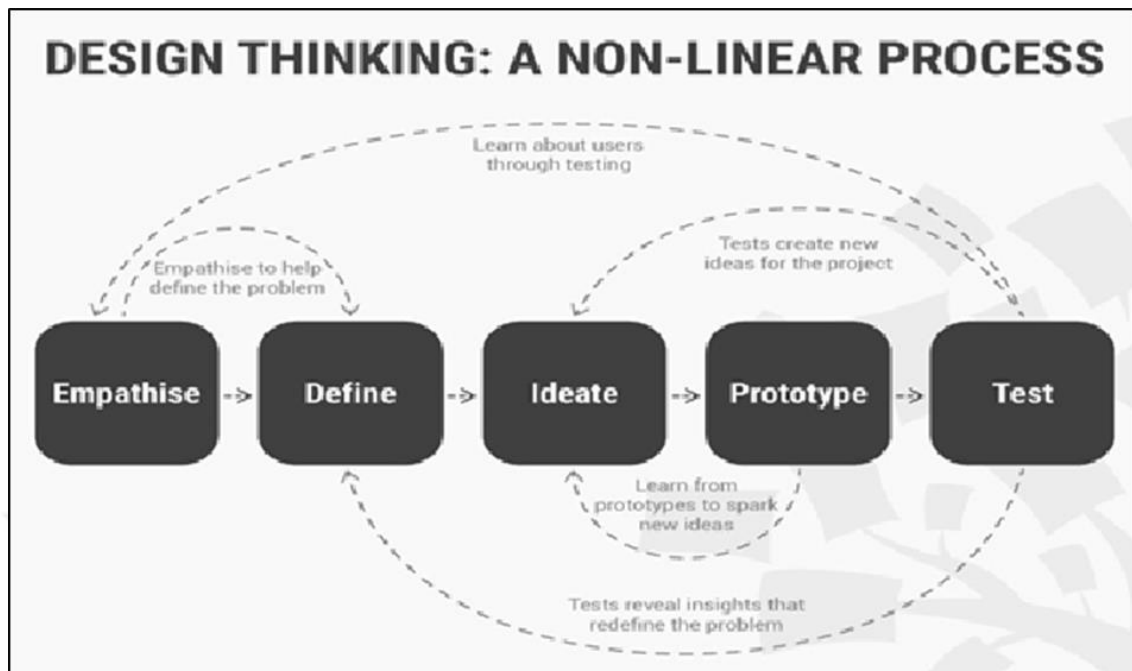
Design-oriented thinking is extremely useful in combating brain poorly defined again or unknown problems, with human-centered techniques, to reformat the problem, to create many ideas in brainstorming sessions, and to adopt a practical approach in the prototyping and testing phase. Design-oriented thinking also includes ongoing experiments: sketching, prototyping, testing, and testing concepts and ideas.

### **6.1.1 Stages of Design Oriented Thinking**

There are many variants of the design-oriented thinking process that are in use today, and they have 3 to 7 stages or fashion.

According to the 5-stage model proposed by the Hasso-Plattner Design Institute in Stanford, the five phases of design-oriented thinking are as follows:

1. Empathize: Empathize with your users.
2. Define (define) your users' needs, problems and insights.
3. Ideate: By combining assumptions and developing ideas that create innovative solutions.
4. Prototyping: To start producing solutions.
5. Test: Test the solutions.



**Figure 6.1** Designer Thought Methodology

This 5 phase is not always consecutive. As can be seen in Figure 6.1, they do not have to follow a particular order, but they can occur in parallel and iteratively. Therefore, it is not necessary to understand these phases as a hierarchical or step-by-step process.

Rather than successive steps, they should be considered as a summary of the modes or stages that contribute to an innovative project. Sometimes - like design-oriented thinking - the easiest way to understand an abstract thing is to understand what it is not. People naturally develop thought patterns that are modeled according to repetitive actions and widely available information.

These patterns help us to implement the same actions and information quickly, in similar or familiar situations; it also has the potential to quickly and easily access new ways of seeing, understanding and resolving issues, and thus preventing us from opening new ways of solving these problems. In this respect, design-oriented thinking is also known as thinking outside of the box.

Design-oriented thinking is mostly an effort of designers to develop new ways of thinking that do not fit the dominant or more common problem-solving methods.

The heart of design-oriented thinking; it is the intention to analyze products by analyzing and understanding how users interact with the product, and by researching the working conditions of the products. At the heart of design-oriented thinking lies the interest and ability to ask important questions and to challenge the assumptions.

An important aspect of thinking outside of molds is to distort previous assumptions; in other words, it is possible to prove whether the previous assumptions are valid or not. When we question the conditions that make up a problem, the process of generating a solution helps us produce ideas that reflect the specific limitations and aspects of the problem in question. Design-oriented thinking allows us to go a little deeper; it helps us make the right kind of research, prototypes our products and services to reveal new ways to improve product, service or design.

The designers resist to the flying jumping reflex to solve the problem. Instead, they spend time trying to determine what the underlying (root) issue is. They don't try to look for a solution until they determine the real problem, and instead of solving it, they stop addressing a wide range of potential solutions first. Only in this case they concentrate on their suggestions. This process is called design thinking.

Design-oriented thinking is a basic tool - and a third way. The design process often involves a large number of different groups of people from the different departments; therefore, it may be difficult to develop, categorize and organize ideas and problem solutions. One way of conducting a design project and organizing basic ideas is design-oriented thinking.

Tim Brown, CEO of the renowned innovation and design company IDEO, in his successful book, *Change by Design*, says that design-oriented thinking is precisely based on understanding people's problems with a holistic and empathetic approach, and they are ambiguous, such as emotions, needs, motivations and motives of human behavior. or - by nature - includes subjective concepts.

Tim Brown summarizes that design-oriented thinking is a third way: Design-oriented thinking is basically a problem-solving approach that combines rational and

analytical research with a holistic user-focused perspective and clarifies design to produce innovative solutions. Design-oriented thinking provides access to what we all have, but which are ignored by more traditional problem-solving practices. It is not just human centered; it is human in its own right and deeply.

Design oriented thinking; it is based on our ability to be intuitive, to recognize patterns, to produce ideas that are as emotional as functionality, and to express ourselves by means other than words or symbols. Nobody wants to do a job based on emotion, intuition and inspiration; excessive dependence on the rational and analytical can also be as dangerous.

The holistic approach at the center of the design process suggests a whole third way design. Design-oriented thinking, thanks to the strong foundation of science and rationality, aims to provide a holistic and empathic understanding of the problems faced by people. Design-oriented thinking tries to empathize with people. This includes ambiguous or, by nature, subjective concepts, such as emotions, needs, motivations and the motives of human behavior.

The nature of design-oriented thinking and the generation of ideas and solutions means that this approach is often more responsive and relevant to users in what context they use a product and how they face challenges and barriers when interacting with that product. The creative element of design-oriented thinking is found in the methodologies (design methodology) that real users use to produce solutions and insights into their practices, actions, and thoughts.

## **6.2 Technology Readiness Level (TRL) Method**

The Technology Readiness Level (TRL) or Technology Maturity Level (TML) is an index used to measure the level of maturity and availability of a technology under development. This index, which was developed by NASA researchers in the 1970s, is used mostly for decision-makers for comparison, risk management and funding decisions. The TRL is sorted from one to nine.

The introduction of the Technology Readiness Level (TRL) mainly to innovation is the fact that it was first adopted by the European Space Agency (ESA) and then

included in the Horizon2020 framework program (2013-2020) by the commission. Thus, it will be shown how the relationship between industry will be in the advanced stages of basic and applied scientific research.

In fact, the identification and follow-up of TRLs is used by the EU as a draft of the path from theoretical research to commercialization.

The Technology Readiness Levels (TRL) nine stages are as follows.

TRL Level 1: Observation and reporting of basic principles. The lowest technology is the preparation level. It mainly involves the paper's basic features on paper. At this level, basic research principles are presented by an observation or a report.

TRL Level 2: Technology concept or application formulated. Theory and scientific principles focus on defining the concept in a particular field of application. Characteristic of applications are defined. Analytical tools are developed for analysis or simulation of applications. There is no experimental evidence or detailed analysis at this stage. The new concept is based on physical and mathematical principles.

TRL Level 3: Critical function and / or feature proven based on analytical and experience. The concept demonstration is approved. In this step of the process of technology maturation, it started with active R & D, analytical and laboratory studies. At this level, the ideas put forward in TRL 2 must be proved experimentally and analytically.

TRL Level 4: Laboratory bench, component and sub-component verification was performed. A prototype was obtained in the laboratory. It is the stage in which the prototype is integrated with all components and is confirmed by test. Technology subcomponents or basic technologies are all integrated on the prototype. During the testing phase, all the basic technologies and subcomponents are tested and the prototype is tested with full scale problems and data sets. A prototype was obtained in the laboratory.

TRL Level 5: Proper correct validation of the laboratory prototype (on-board design or your choice). It is the stage in which the laboratory prototype or the representative model is present therein (in places representing the real environment) in the first experiment and verification where appropriate. TRL 4 and TRL believe that the basic

key difference is being developed. Prototype preparation should meet the target environment and interfaces.

TRL Level 6: System / subsystem model or prototypes were shown where appropriate. Fully functional troubleshooting is where all possible real problems are applied to a representative model or prototype under appropriate ambient conditioning conditions. At this stage, the prototype or the representative model did not fly or be sent into space. The tester will simulate these environments. The prototype of the mass production can be discovered at the end of this phase.

TRL Level 7: Prototype is shown in operational environment (real environment). In the operating environment (in the real environment) is the stage of system prototype representation. The system or prototype is suitable for test demonstrations and tests of all functions in real scale or close to real scale. Verification was performed in the operational environment (eg. for the conduct of flight tests or phase 2 study for drugs and approval of the US Food and Drug Administration (FDA) for Phase 3 clinical investigation or a period of testing of an automated hospital bed in hospital, etc.). Serial production prototype improvements are made. The prototype is well integrated with complementary and master systems. Design approvals and tests.

TRL Level 8: The system was completed and the performance evaluation was carried out by testing and demonstration (preparations for the production line were completed). The system is the final stage of development. Most user documents, training documents and maintenance documents have been completed. Final production drawings have been completed. All functional tests have been tested with different scenarios in the operating environment (international certifications American Federal Aviation Agency certification). Quality certificates have been completed.

TRL Level 9: The system was commercialized. System life cycle planning is completed (production / investment, operating and maintenance cost items, etc.). Optimum cost items are planned. The product / system is commercialized; presented to the market.

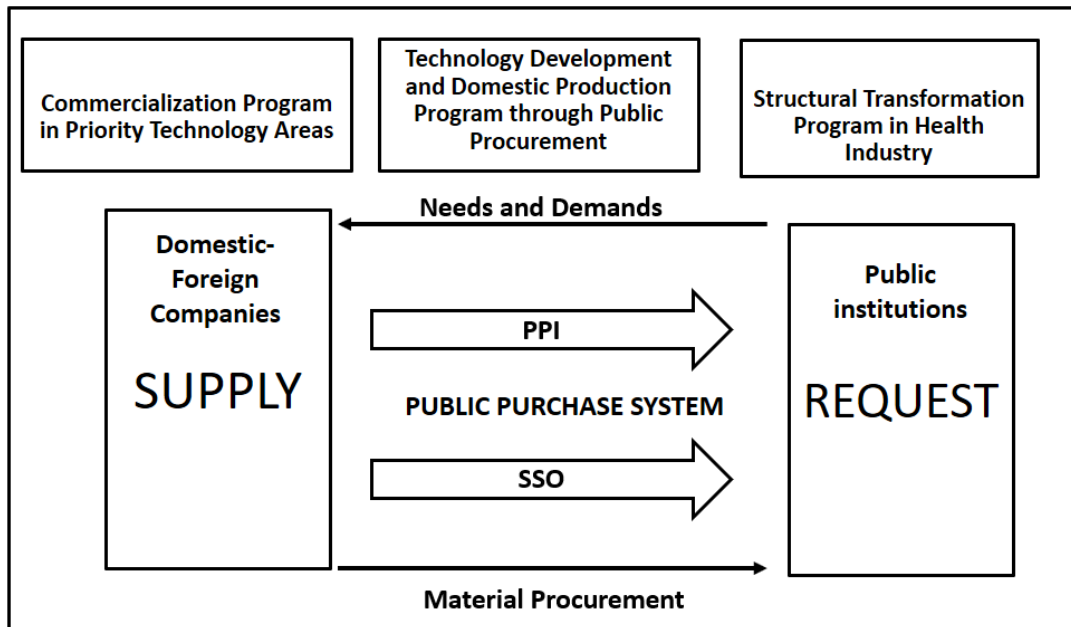
The TRL approach is not a magic wand but a functional conceptual tool. As a nation that falls under the threat of aiming at the vehicles, perhaps we do not lose anything more than the remaining countries.





**CHAPTER 7**  
**7. METHODOLOGY AND PROBLEM DETECTION**

The state of supply and demand in public procurement is shown in Figure 7.1. In the Public Procurement Law has a price advantage of up to 15 percent in favor of domestic bidders, but public procurement is unable to contribute to the transfer of technology or the development of industry. The expression '.



**Figure 7.1** Overview of Public Procurement and 10th Development Plan Programs

In other words, the most important and single application related to public procurement, domestic production and technology transfer has not been achieved in our country.

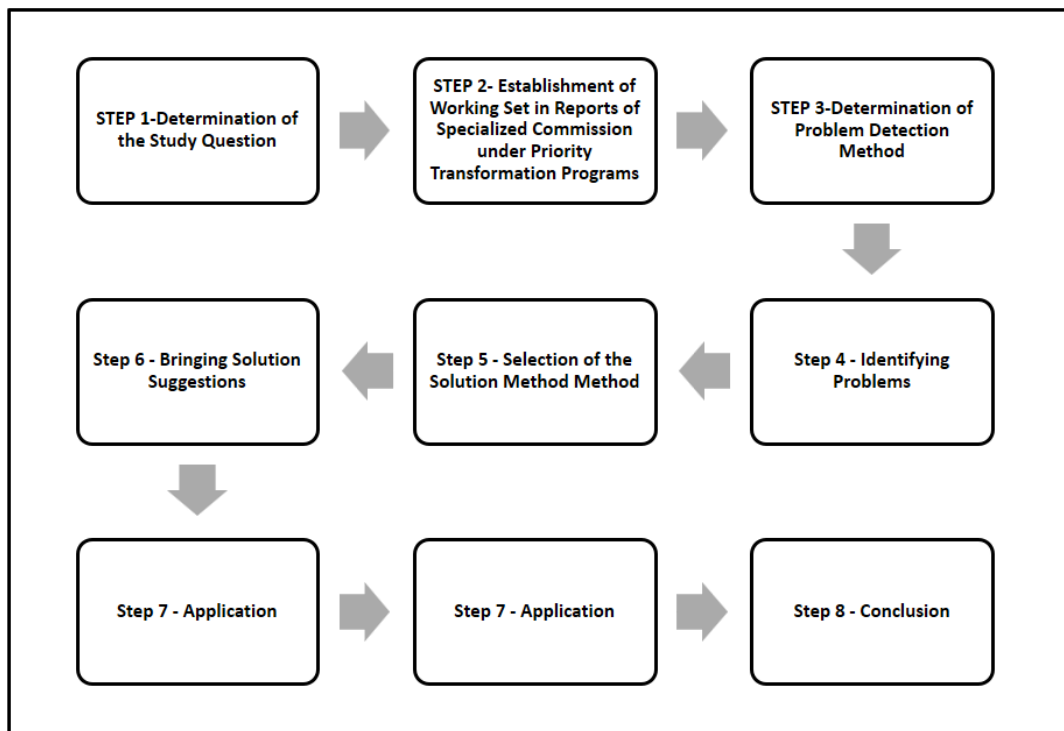
Technology-based development is required for our country's future targets. In this process, public procurement; It should be used as leverage for innovation, localization, technology transfer and entrepreneurship.

In order to reach the targeted output from public procurement;

- What are the problems that our entrepreneurs face throughout the value chain, from idea to prototype, from production to marketing, from sales to after-sales services and exports, to the fact that the 15% price advantage cannot be applied?
- How should a new method be designed and implemented in order to achieve targeted outputs from public procurement and to get more share of our entrepreneurs?

The questions are set out.

In particular, the 10th Development Plan of Priority Transformation Programs, a study was carried out taking into consideration the main objectives and objectives in



**Figure 7.2** 8-Step Operation Method

the programs related to domestic production and entrepreneurship.

For this, the 8-step step path given in Figure 7.2 is followed.

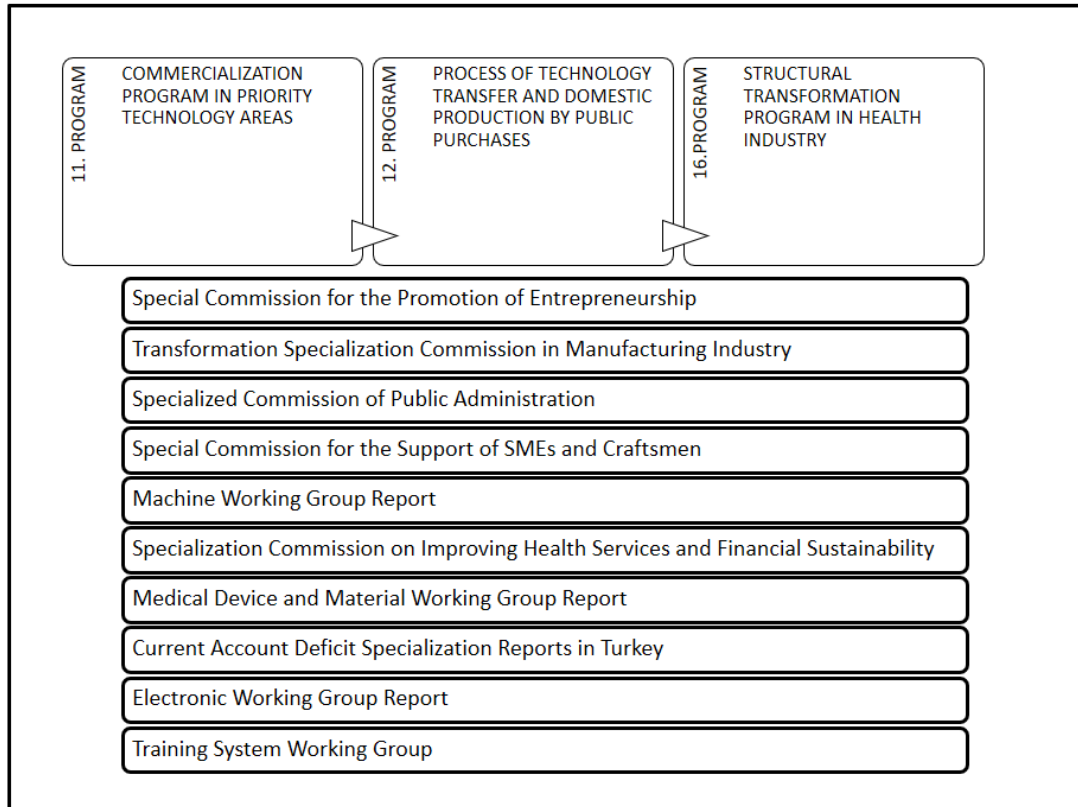
### **7.1. Step 1 Working Question**

The output of domestic production and entrepreneurship support expected from public procurement cannot be reached. To achieve this goal;

- What are the root causes and problems of entrepreneurship ecosystem in public procurement throughout value chain?
- Through public procurement; What kind of a model should be designed and implemented to support innovation, locality, technology transfer and entrepreneurship?
- As the Central Procurement Authority, is the current business model of the State Materials Office able to address the problems of entrepreneurs?
- How can the State Materials Office find solutions to this problem with the new models it will develop and design?

### **7.2. Step 2 Creating a Workgroup**

The 3 Priority Transformation Programs included in the 10th Development Plan and the Special Commission Reports on them were analyzed for the problems of the technology companies. The problems contained in the commission reports are presented under some main headings as in Figure 7.3.



**Figure 7.3** 10th Development Plan Priority Transformation Programs and Special Expertise Reports

In the Specialized Commission Reports, problem sets are presented in the following headings

### 7.2.1 Problems of Public Procurement Law

In Turkey, a large part of the public procurement purchases are made through tenders in accordance with the Public Procurement Law. The problems faced by our entrepreneurs and sectors developing technology have been reflected in the Specialized Reports as follows.

- Marketing and sales to individual units (Marketing activities remain undetected)
- The construction of the PPL technical specification in favor of strong competition firms
- Choice of cheapest products with PPL

- The brand model cannot be indicated in the PPL
- Technical specifications in the PPL indicate the specific situation in the import products of large firms
- Decrease in innovative product acquisition by the PPL
- Lack of price advantage in favor of 15% domestic product with PPL
- Non-price factors are taken into consideration in tenders
- Lack of expert personnel in public institutions

### **7.2.2 Cash Flow and Financial Problems**

Cash flow management is one of the most important problems in today's business management. The problems encountered in finance in public procurement are reflected in the Specialization Reports as follows.

- Low cash flow rate due to the length of tendering processes
- Length of repayment periods (SGK payments for medical devices)
- Lack of companies with strong capital structure to survive in the local market
- Due to weak financial structure, companies also shift to imports.
- There is no study on facilitating repayment of domestic products

### **7.2.3 Marketing and Branding Problems**

Marketing is the most common problem of almost all of our companies in all sectors from micro scale to small scale, from medium to large scale. As a country, there are a lot of points in this area that we need to take a long way compared to our foreign competitors. Problems encountered in marketing and branding in public procurement are reflected in the Special Expertise Reports as follows.

- Lack of marketing experience and knowledge of domestic manufacturers
- Lack of access to national scale market
- Not being used in the country where it is produced
- Some prejudices to the domestic product
- Low market knowledge and experience of producers (National-International)

#### **7.2.4 Competition Problems**

The main problem of public procurement is that firms of different sizes cannot compete in the market. The problems encountered in this regard are reflected in the Special Expertise Reports as follows.

- Local firms are developing their products, entering the market, increasing the risk of holding them in the market and not sharing these risks with the policies to be followed.
- The aggressiveness of global firms and the decline in competitiveness of local firms

#### **7.2.5 Ownership and Awareness Problems**

Public procurement is the area in which countries often claim their country's products as a kind of nationalism. The problems encountered in this field in our country are reflected in the Special Expertise Reports as follows.

- High risk of domestic product before entering the market
- Ownership of the domestic product at the point of sale of the product
- Increased support between clustering centers and domestic companies
- Being a sectoral industrial strategy and not becoming a producer
- The weakness of public-university-industry cooperation
- The Scientific and Technological Research Council of Turkey (TUBITAK) to support projects conducted by
- Public hospitals are not encouraged to use domestic goods
- University-industry cooperation and university-public-industry cooperation is required

#### **7.2.6 Collective Purchase Problems**

Public procurement policies are a must for healthy public procurement management. A systematic public procurement policy cannot be implemented in our country. The problems encountered in this regard have been reflected in the Specialization Reports as follows.

- Difficulties and out-of-market firms in the bulk purchase process, except for the firm that won the tender
- Central public procurement to end SMEs

### **7.2.7 Structural Problems**

In our country, there are dozens of public institutions and organizations, which have different main objectives in both public procurement and entrepreneurship ecosystem. If the problem arises in any part of the value chain, it is seen as structural problems in the other rings of the chain. The problems experienced in this matter have been reflected in the Reports of the Specialization Commission as follows.

- Domestic companies are not preferred in public procurement due to weak infrastructure of after-sales services
- Domestic products are not preferred due to lack of international quality.
- Structural barriers to shift from traditional technologies to high-tech products
- Innovation-oriented structure and the company's shortage
- Absence of analyzes to evaluate medical technology
- Regulation, purchasing and reimbursement system development
- Deficiencies in the integration of public institutions
- The absence of alternative approaches to the lowest offer in public procurement
- Shortage of domestic product quality
- Public procurement does not support the sector
- Lack of technology procurement policies of relevant institutions
- Late repayment of domestic product is made late
- Turkey cannot be used enough of the size of the domestic market
- Support for strategic SMEs with public procurement
- Lack of R & D projects by universities
- Lack of regional development with entrepreneurship
- Regional dynamism cannot be triggered in innovation
- Innovative product demand is not strong (encouraging innovation)
- Innovation in government support in entrepreneurship does not find value as it should be

- Inadequacy of patent-numbered research
- Entrepreneurship and innovation culture is not established
- Identifying entrepreneurship opportunities with public procurement and not working on it
- Non-promotion of domestic product entrepreneurship in public procurement
- Opportunities should be created with public procurement and performance improved
- For strong brand; strong and high quality demand but not purchasing
- Increasing entrepreneurship culture and talents
- Not supporting the entrepreneurship culture with concrete projects

The problems were grouped under seven main headings.

### **7.3 Determination of the 3rd Step Problem Detection Method**

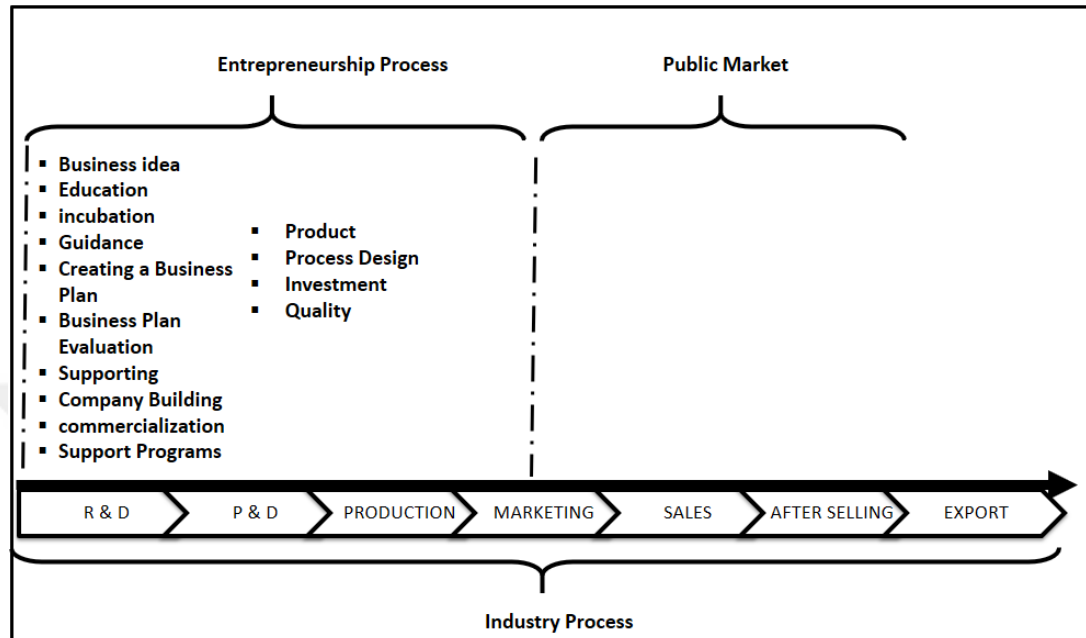
In the thesis study we have realized, we tried to understand the public dynamics and entrepreneurship ecosystem with different dynamics. From the point of view of the value chain, the designer thought method was used to understand the entrepreneurship ecosystem, to identify problems and to design new solutions.

Leading in our country; Gaziantep Technopark, METU Techno polis, Bosphorus Technopark, including many entrepreneurs, academicians, techno parks managers came together. All entrepreneurship process is handled; public procurement as a whole from business idea to prototype, from production to marketing, from sale to after-sale services has been examined. After the established contacts, the problems were identified and then the problems that were determined by going back to the site were reviewed. On the one hand, with the help of the designer thinking perspective, problems were tried to be developed while on the other hand, solutions were tried to be developed.

Two points have been taken into consideration at this stage. First of all, not to be caught in the legal legislation, not to be considered as a limiting element in the study on the other hand different countries at this stage, ignoring the implementation of the problems and dynamics unique to our country is to understand.



The result of this and the attention that draws attention; they are faced with very different problems according to the scale of the firms and the sector.



**Figure 7.4** Value Chain from Idea to Export

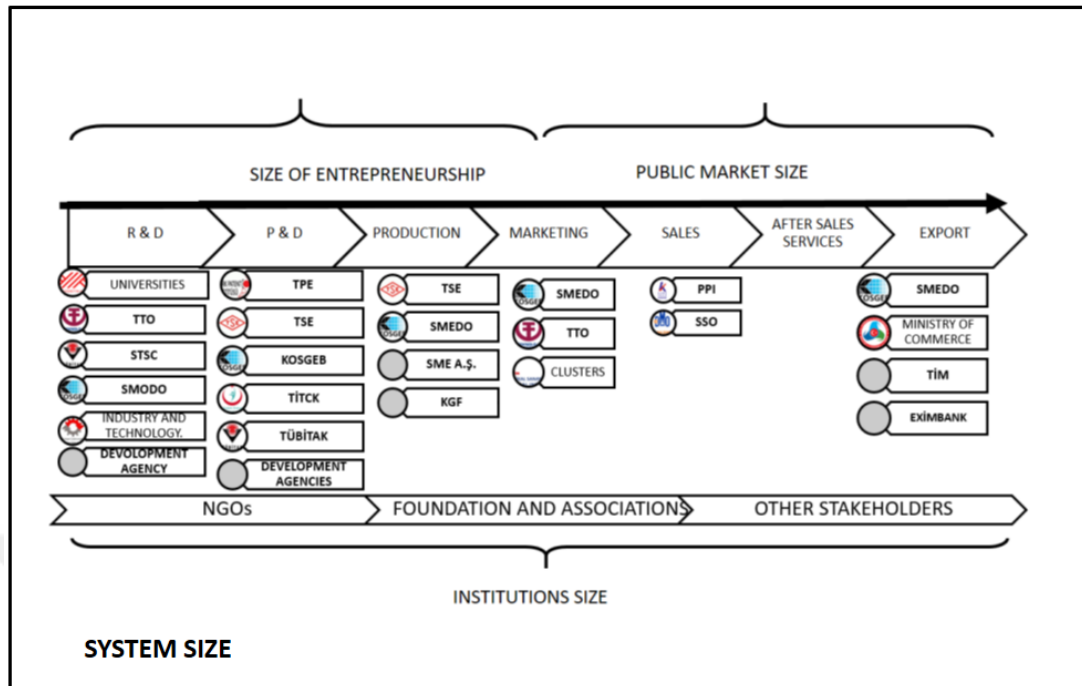
#### 7.4 Identifying Step 4 Problems

METU Technopolis is in the area of Bosphorus Technopark, with the help of designer thinking method. Dozens of entrepreneurs, academicians, counselors were interviewed and the problems were determined from their eyes.

The problems identified are shown on the value chain as in Figure 7 and divided into dimensions as in Figure 7.4

Problems with general lines:

- Public Market Size Problems
- Entrepreneurship Dimension Problems
- Institutions Size Problems
- System Size Problems



**Figure 7.5** Demonstration of Problems with All Sizes

#### 7.4.1 Public Market Size Problems

One of the most important shortcomings of our technology developing entrepreneurs is the lack of established marketing units. According to a survey conducted by the Independent Industrialist Businessmen Association (MUSIAD) in 2018, it was seen that 85% of the entrepreneurs operating in the Technology Development Zones were not employed by any marketing personnel. This clearly shows how much the country's entrepreneurial ecosystem is devoid of marketing. All problems are illustrated from the size of the public market as in Figure 7.5.

##### 7.4.1.1 Purchases within the scope of Public Procurement Law

The most widely used channel in public procurement is the contracting of the public procurement authority. Market size problems are as follows.

#### **7.4.1.1.1 Long tender processes**

There is a procurement process determined by the tender price in public tenders. In case of any objections, the addendum process is executed. This process, which consists of the realization of the tender, contract signing, delivery and payment, is 3-6 months. Entrepreneurs who are trying to manage the R & D process and organize the sale with a small number of staff; affect the time and human resource as a problem

#### **7.4.1.1.2 Marketing and Sales**

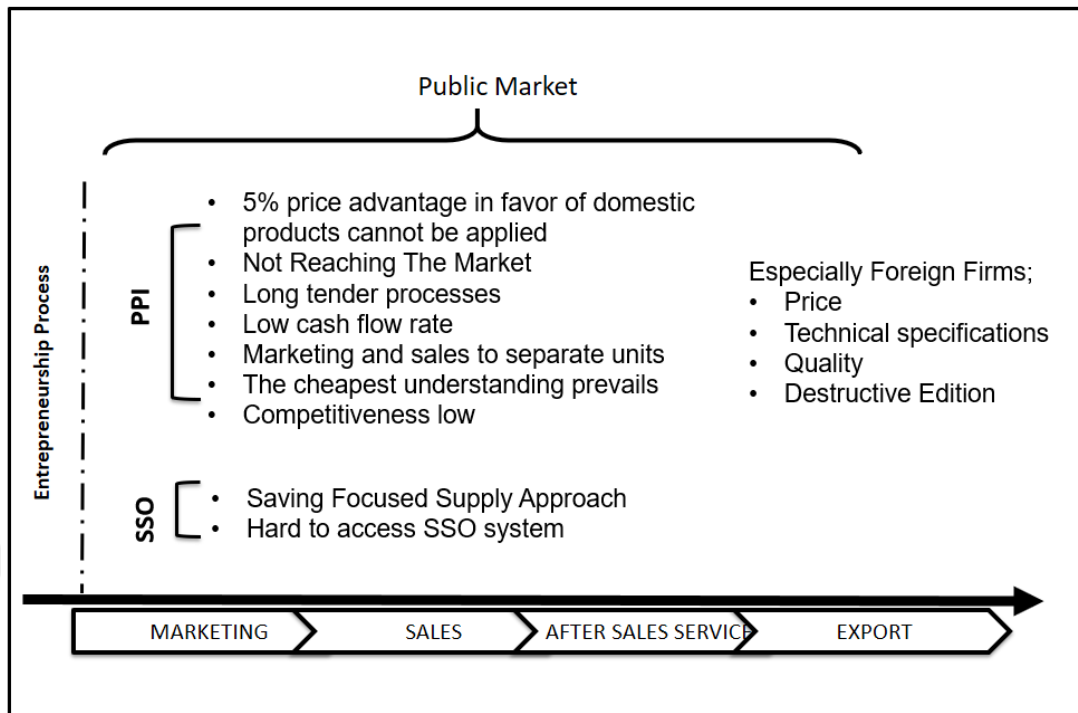
The unit that performs purchasing with the unit that will use the goods in the public sector is often separately. Even if entrepreneurs with domestic-national design and solutions have convinced the purchase and use of the unit that will use the goods, many tenders are faced with the purchase of different products. Although the user wants the unit very much, he cannot supply the domestic product as he wants.

#### **7.4.1.1.3 Cash Flow Rate Low**

The tender announcement process, the procurement objection process, the tender contract process after the procurement, the delivery and payment of the entrepreneurs are considered to be waiting for up to 4-7 months. These periods mean blood loss for entrepreneurs who are already trying to survive depending on support. Because, considering the existence of cost-forming elements such as letter of guarantee or letter of guarantee in different cities, the cash flow problems of entrepreneurs deepen.

#### **7.4.1.1.4 Cheapest Approach**

Although there are some local favorable regulations in the context of the Public Procurement Law, it is common to quit the tender, which is generally the cheapest.



**Figure 7.6** Public Market Size Problems

#### 7.4.1.1.5 Competitiveness Low

In our country, there is a clear leadership of world giants in high technology product groups. Local entrepreneurs do not have many chances in the face of products that are placed in the market with quality and pricing in different categories especially by foreign root companies. It is impossible for entrepreneurs who have just entered the market to compete with the big marketing networks of these firms.

All of these problems are shown in Figure 7.6.

#### 7.4.1.2 Public Procurement within the State Supply Office

The second channel, which is the most widely used in the public procurement, except for the tenders of the administrations under the supervision of the Public Procurement Authority, is the State Supply Office channel as the Central Procurement Authority. The main problems encountered in the market dimension are as follows.

#### **7.4.1.2.1 Saving Focused Approach**

In general, it is seen that the most favorable price is preferred in tenders realized through State Material Office. It is seen that it is not important for the company to make technology transfer, to have the product as a result of any R & D project and to have patents.

#### **7.4.1.2.2 Introduction to SSO Catalog System**

Especially in the General Catalog, where technology entrepreneurs are included, it is seen that the biggest companies of the world are at the same time. At this point, it is seen that the documents requested from a large-scale company of the world giant and the documents requested by an entrepreneur who has just entered the micro-scale market are the same. It is difficult for an entrepreneur who has just reached the market with micro-scale documents that have been owned by decades of world giants.

With the problems arising from our tender system, especially foreign companies; price, technical specification, quality, after-sale services are subject to destructive pressure. Large companies can easily push the domestic and national solutions and designs of our entrepreneurs outside the tender with a few small special items in technical specifications.

#### **7.4.2 Entrepreneurship Size Problems**

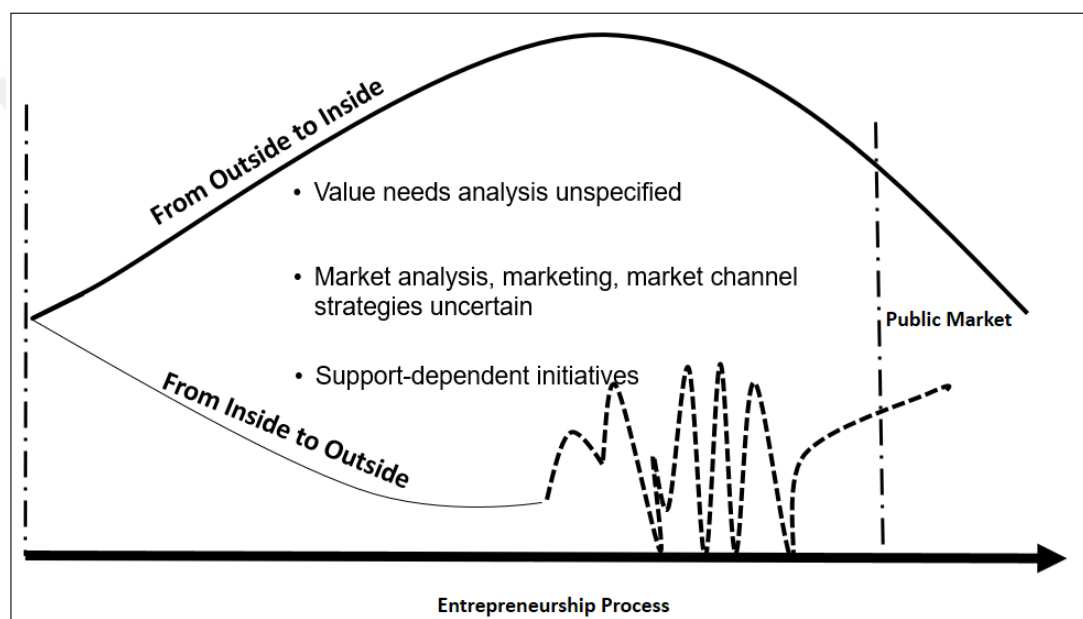
In countries where entrepreneurship ecosystem is developed, entrepreneurship from outside to inside starts from producing solutions to the real need or problem. However, these needs and problems are often provided by the differences in the competitive value between sales and after-sales services.

The entrepreneurial ecosystem of our country shows an outward appearance from this perspective. So first comes an idea. Then, work is started to bring the idea to life. Most of the time the idea is not fed by a real problem or need in the market. As such,

our entrepreneurs' business plan, business model, market and marketing strategies seem to be inadequate.

It is impossible to meet the market needs of the products of our entrepreneurs who have no real problem and need in the market and stand on their feet with sales. This situation causes entrepreneurs such as a baby-dependent pre-mature baby to survive.

And these entrepreneurs cannot reach the market, and they seem to have pessimism that morale motivation breaks down.

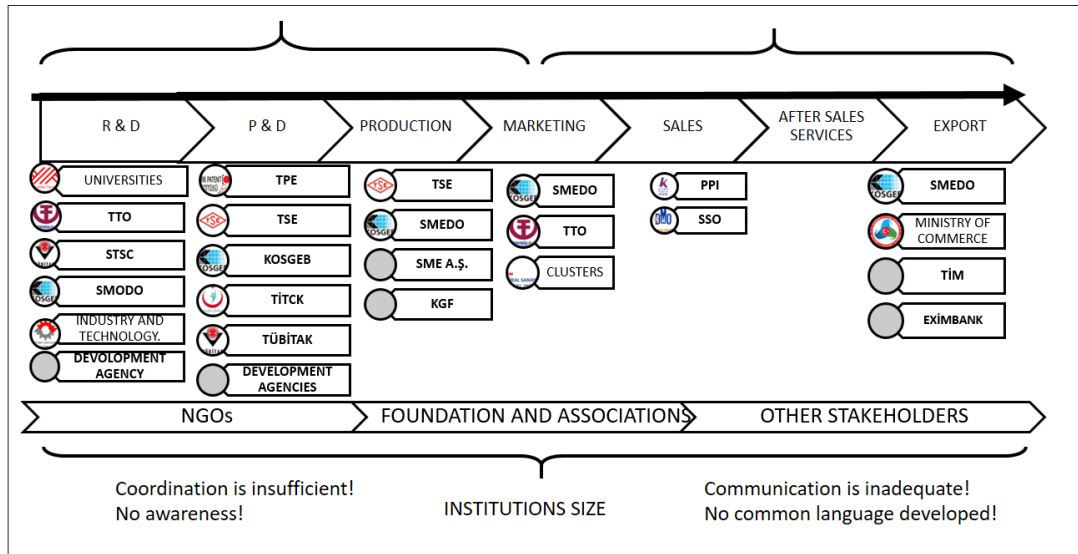


**Figure 7.7** Entrepreneurship Size Problems

As we approach the market, it is seen that there is a lack of marketing and sales functions and the risks and uncertainties increase. All indicated points are shown in Figure 7.7

### 7.4.3 Institutions Size Problems

Public institutions; in the value chain shown in Figure 7.8 which is a whole from R & D to product development, from production to marketing, from sales to after-sales services and exports, the same goal is for the development of our country.



**Figure 7.8** Institutions Size Problems

Among these public institutions operating under different ministries; communication, coordination, awareness and common language development problems are observed. As a result, the common goal cannot be reached at the end of the day.

All these institutions should be clamped around the ultimate goal to go beyond local achievements. This is because entrepreneurs' growth in sales contributes to the development of the country as a result of the initiative as a result of economic and social development.

#### 7.4.4 System Size Problems

With all the other problems, there are systemic problems in the public procurement of our country. Our country needs technologies; cannot determine, transfer or produce, cannot improve with innovations.

The main reasons can be listed below.

##### 7.4.4.1 No Technology Management Understanding

Which products can be produced by our entrepreneurs?

Which products can't produce?

Which of our products cannot be produced in the future which our companies can produce?

We are unable to answer such basic questions. We don't have space maps. As such, there are problems in managing supply and demand, organizing incentives and innovation policies according to the outputs.

#### **7.4.4.2 The Value Chain Is Broken, No Value Flow**

The disconnections between the different rings of the value chain, which must be managed as a whole, from the different public institutions to the idea, prevents the conclusion of the result. The output of a public institution is the input of the other public institution and ultimately success is required.

### **7.5 Choosing the Solution Method**

After identifying the problems faced by the entrepreneurs in the public procurement and entrepreneurial ecosystem, the business model of the State Materials Office was analyzed in order to find solutions. State Material Office's existing business model with these solutions to the solution of these problems were examined. The business model of the State Material Office was analyzed by applying the Canvas Business Model.

With the existing business model that has a Saved Focused Procurement Approach of the State Materials Office, it has been evaluated that it would be appropriate to introduce Value-Oriented Development Approach next to the current business model by making a business model innovation.

### **7.6 Fetching Solution Suggestions**

The main reason for not achieving the outcomes that our country has aimed to date with public procurement has been the fact that it does not address the problem with a real understanding of entrepreneurship and public procurement. If these two



dimensions are not looked at the same time, the results and applications developed to solve the problems cannot be reached.

As a result of the field studies, the problems identified, the analyzes carried out and the business model designs made for the solution as a result of public procurement; in order to support innovation, localization, entrepreneurship and technology transfer, a 3-step solution was proposed.

In these 3 stages;

1. Implementation of SSO Techno Catalog Platform and Supporting with Awareness Works
2. Reengineering the value chain around the Technology Preparatory Level concept
3. Transition to Technology Management

#### **7.6.1 Implementation of SSO Techno Catalog Platform and Supporting with Awareness Works**

It is seen that State Material Office adopts Saving Oriented Supply Approach in business model analyzes. It is argued that this business model does not provide real solutions to the problems faced by our entrepreneurs throughout the value chain. And with a business model innovation, it is proposed to introduce a Value-Oriented Development Approach to the State Material Office's Saving-Focused Procurement Approach.

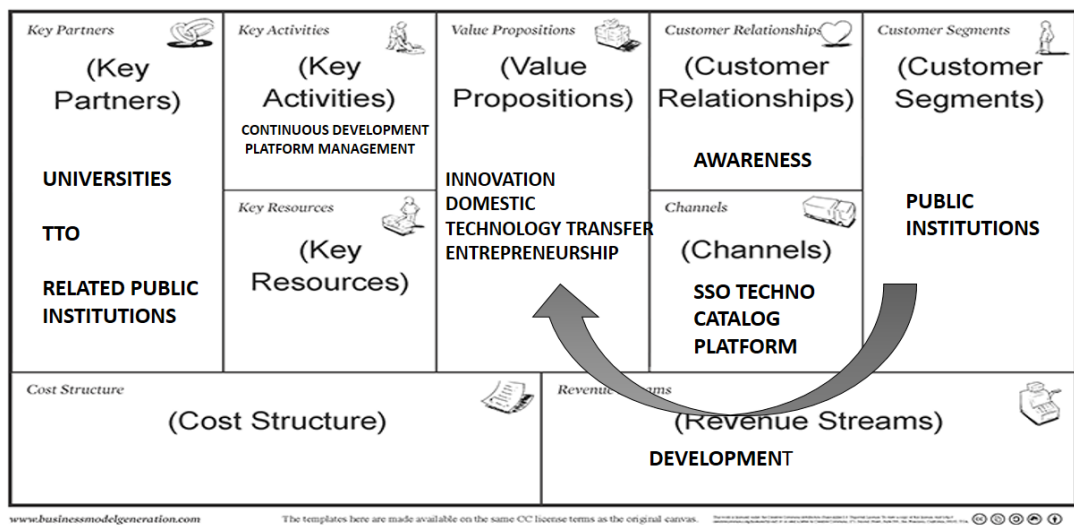
When the value is mentioned; innovation, localization, technology transfer, entrepreneurship, qualified employment, patent, export. To achieve this, it is recommended to install the SSO Techno Catalog Platform. Techno Catalog Platform The business model of the SSO Techno Catalog Platform, in which only goods are exchanged, is shown in Figure 7.9. It has a view far beyond the catalog structure of the State Supply Office.

SSO Techno Catalog Platform; supply and demand are required to have a view to develop entrepreneurs and to communicate and interact. For the SSO Techno Catalog

Platform, a business model built entirely on communication is presented. This business model envisages the establishment of strategic relations with the cooperation with the key partners. With the SSO Techno Catalog Platform, it is considered as a problem of public procurement and the share of entrepreneurs producing technology from the public procurement is considered as a problem of commercialization and solutions are offered.

The fact that our entrepreneurs cannot get a share from public procurement is due to the weakness of their basic marketing competencies. With these value suggestions, it is thought to support the process of gaining Marketing Competence which will contribute to the essence of commercialization and branding which are actually two words.

In this context, the SSO Techno Catalog Platform offers net value suggestions to entrepreneurs' business models.

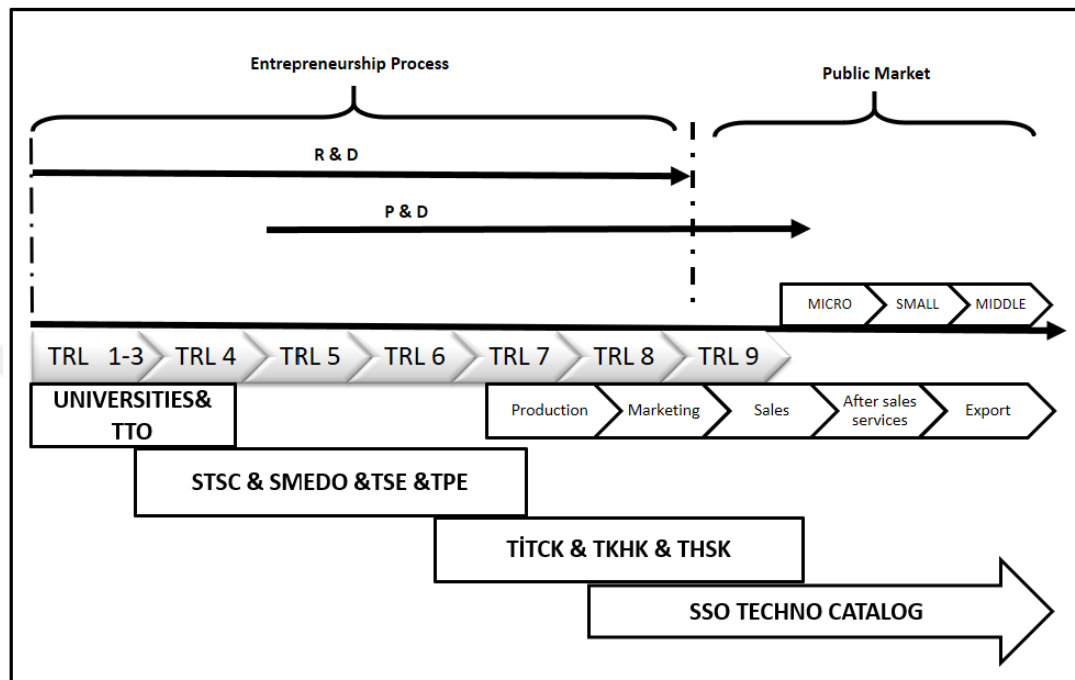


**Figure 7.9** SSO Techno Catalog Platform Business Model

### 7.6.2 Technology Preparatory Level and Value Chain

The SSO Techno Catalog Platform should be a common language among all stakeholders in the value chain that need to be implemented. In fact, many stakeholders working for the same goal - the development of our country - are not aware of this because there is no necessary and adequate communication. The entire

value chain should be brought together under the Technology Preparatory Level as shown in Figure 7.10. In this way, the relevant stakeholders from the business idea to marketing sales will see the reflections of all stages more clearly and will meet with a medium language.



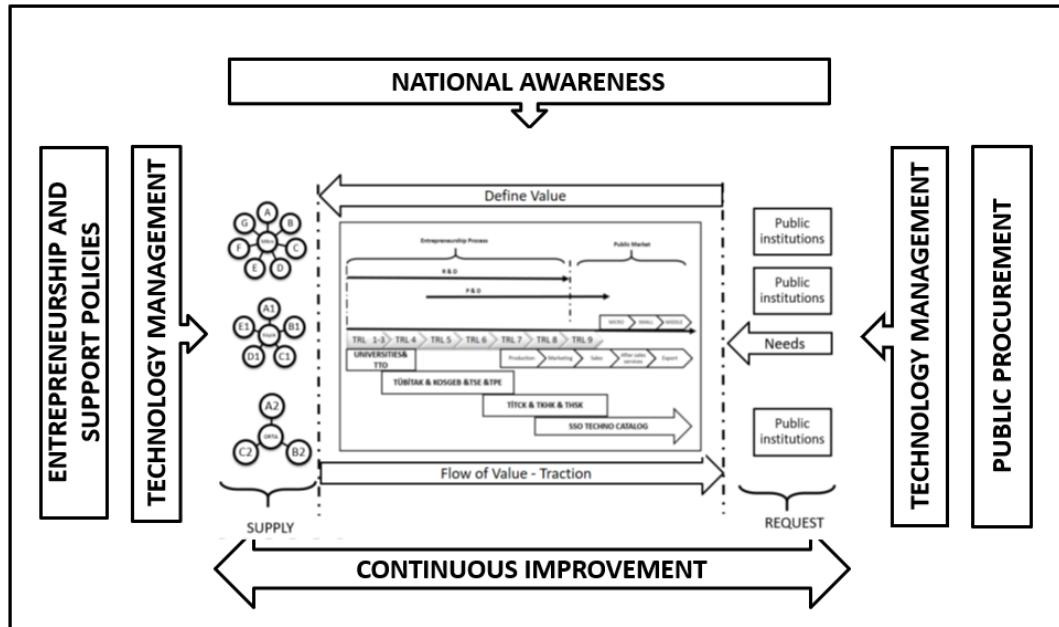
**Figure 7.10** Demonstration of Value Chain with Technology Readiness Level

It will be ensured that the value will flow with the stakeholders taking their place according to the Technology Readiness Level. The duty and responsibility of each stakeholder will be much clearer. The output of a stakeholder may be the input of the other. And most importantly, at the end of the day, successes such as sales, scale-up, employment and exports made by entrepreneurs will be the success of all stakeholders in the value chain

### 7.6.3 Transition to Technology Management

After the SSO Techno Catalog Platform is implemented, awareness activities should be accelerated. The value chain should then be collected around the Technology Preparatory Level. In this way all stakeholders will come together for the common

result that all will have. In the following period, macro-level entrepreneurship and incentive policies and public procurement policies should be redesigned.



**Figure 7.11** Technology Management Understanding

These policies are designed to meet the needs of the public, while identifying the products that are in need of the public, determining the current, near future, medium and long term public procurement policies, entrepreneurship, support, SME policies should support. And the system must be developed with continuous innovations according to changing conditions in the world. In addition, all of these designs and products developed nationally by our country should be protected with national awareness movement. All stages are shown in Figure 7.11

## **7.7 Application**

The first one of the three-step solution proposal was implemented with the implementation of SSO Techno Catalog Platform and Awareness Works Support.

The SSO Techno Catalog Platform should be implemented in a way that encompasses Technology Development Zones. Afterwards, it should be expanded step by step to include the technological products that are the result of R & D in our country. At this stage, all stakeholders should be rounded up by focusing on the same result. It is much easier and faster to create mutual value than to agree with the individual SSO.

The contract period should be initially 1 year for the Techno Catalog Platform because it will initially be a very new field for SSO. This period can be extended with necessary evaluations in the following process.

With the introduction of the SSO Techno Catalog Platform, we offer net value suggestions to our business models.

### **7.7.1 Techno Catalog Platform and Entrepreneurs Value Propositions to the Business Model**

#### **7.7.1.1 Being The First and Only Channel for Entrepreneurs Who Will Reach the Public Market**

The solution to the problem that an entrepreneur will bring to the market with his channel and which products will be brought to market with his / her customer while the idea stage is being made, is solved with SSO Techno Catalog Platform.

#### **7.7.1.2 Channel to Improve Sales and Marketing Functions**

With the SSO Techno Catalog Platform, entrepreneurs will increase the rate of reaching the market and converting marketing activities into sales. The energy we spend here can spend on developing our marketing and sales functions. It is planned that entrepreneurs will increase their marketing competence step by step by selecting the lower and upper order limit according to their own requirements according to SMEDO scale.

#### **7.7.1.3 Electronic Sales (E-Commerce) Experience**

The future of the world is in e-sales. Considering that most of the world trade will be on the internet in electronic environment in the near future, Techno Catalog Platform will provide electronic sales experience to a very serious platform controlled and managed by the state.

#### **7.7.1.4 Elimination of the Margin Conflict**

One of the entrepreneurs entering the tenders within the scope of the Public Procurement Law is obliged to use two bank guarantees, one before the tender and one before the contract. As the number of tenders that take place at the same time increases and the number of tenders is increased, the small, financially weak entrepreneurs have difficulty in managing these letters of guarantee. With SSO Techno Catalog Platform, it is determined according to the scale of the entrepreneurs and will be able to realize sales through SSO with a single guarantee.

#### **7.7.1.5 Fast Cash Flow Providing**

Entrepreneurs have very sensitive cash flow fragility due to their structure. As fast as possible, they need to put the money into the cash register. With the SSO Techno Catalog Platform, they will be able to receive their payments within a maximum of 10 days.

#### **7.7.1.6 Special Facilities by Scale**

The problems of different SMEDO scale initiatives in different sectors in our country's ecosystem vary. In particular, micro-sized enterprises are experiencing difficulties in supplying many quality and documents. In this context, it would be appropriate to give some time to the documents according to the scale in SSO Techno Catalog Platform. During this period, entrepreneurs will be able to reach the market and start sales and manage the certification process.

#### **7.7.1.7 Open Platform for Development**

No problem or opportunity in the entrepreneurial ecosystem is too complex to be solved by a single stakeholder. For this purpose, SSO Techno Catalog Platform should be designed to be open to development with the contribution of all stakeholders. Improvements should be made with stakeholders. Especially entrepreneurs should be in the middle of this business.

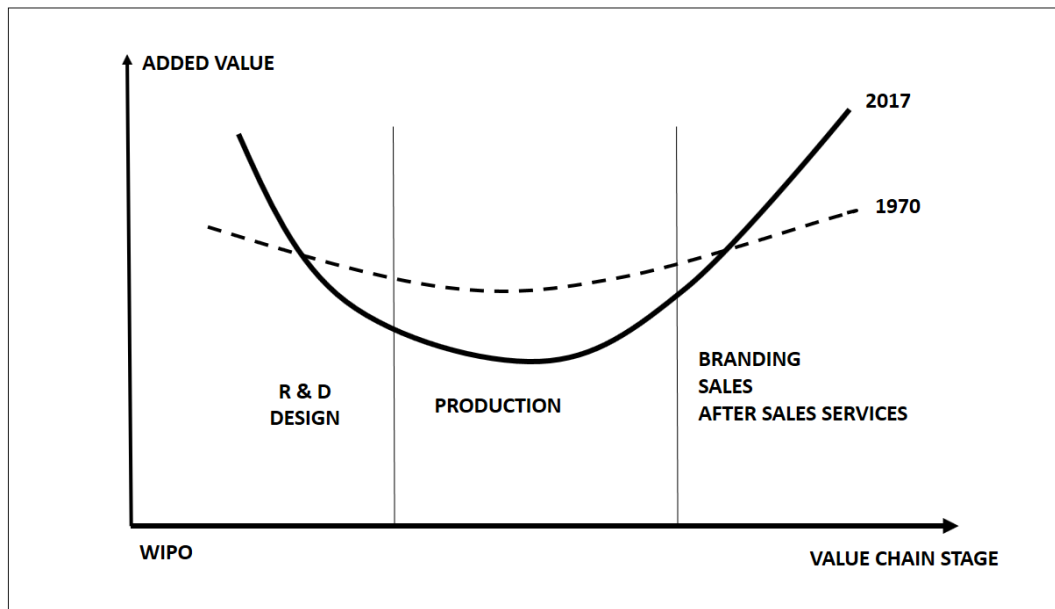
#### **7.7.1.8 Creating Awareness**

SSO Techno Catalog Platform should be at the center of awareness studies especially in terms of being the first and only platform focused on sales. Because, considering the point in the value chain, many problems and opportunities will become more visible. In addition, SSO Techno Catalog Platform will be the only platform that represents entrepreneurs in order to define problems and create solutions by using the language of entrepreneurs.

## CHAPTER 8

### 8. CONCLUSION AND RECOMMENDATIONS

In order for our country to reach its future targets; It is of strategic importance to use innovation as a leverage by supporting innovation, locality, entrepreneurship and technology transfer. When the entrepreneurship ecosystem and public procurement are examined, it is seen that there are many problems that are intertwined.



**Figure 8.1** Formation of Value Added Today (WIPO)

In fact, the studies have revealed that the problem is not a problem of public procurement, but rather a multifaceted commercialization and branding problems specific to the entrepreneurial ecosystem.

These problems need to be dealt with in a systematic and innovative way. For this, the value chain has to come together around the ultimate goal. From this point of view, the main aim of an entrepreneurship ecosystem is to produce economic and



social outputs by commercializing the goods and services resulting from the R & D realized. It is necessary for the enterprises that develop these goods and services to reach, understand and sell their value proposition.

On the other hand, as seen in Figure 8.1 of high technology today, the value chain of product development, value added; branding, sales and after-sales services. For this, it is necessary to support the marketing stage in order to make sense of the value added in R & D and production stage.

When we look at entrepreneurs in our country; branding, sales, after-sales services are very weak. Many entrepreneurs start back to the basic entrepreneurship process. In other words, an attempt is made to adopt an intellectual solution market in our country, while an initiative should start with a problem or need in the market. However, when we look at public procurement in our country, it is seen that the existing applications and business models put forward by related institutions are insufficient.

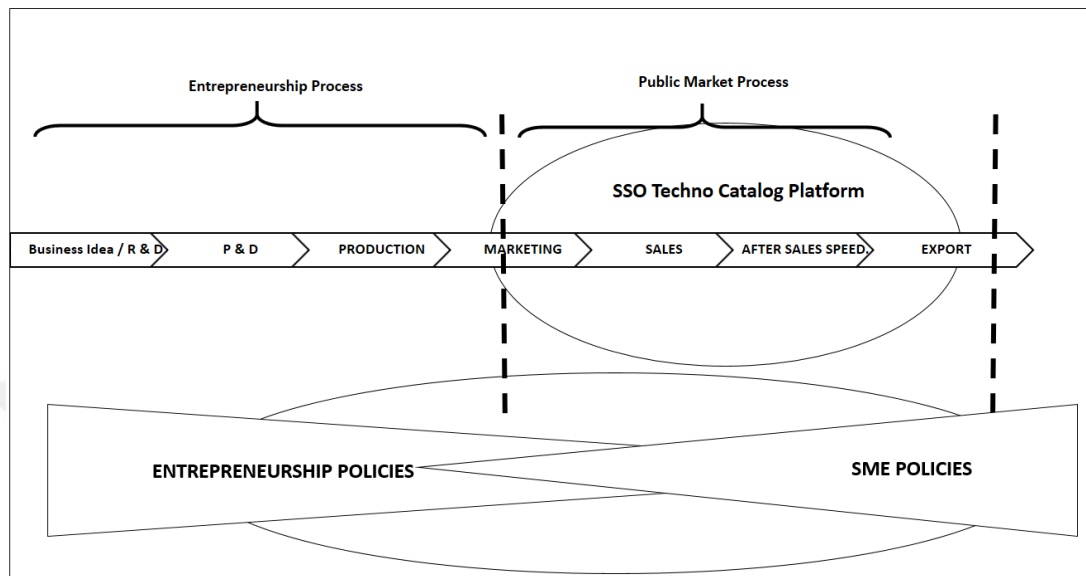
In our country, the most comprehensive application for the development of domestic procurement is a 15% price advantage in public procurement in favor of domestic products. However, despite such an advantage, it is observed that domestic production is not supported by public procurement. If the problem is only the public procurement problem and only in terms of price advantage, it is considered that 15%, maybe 50% in some product groups, even in some circumstances, even if there is a 100% price advantage. Because, in essence, it is a complex problem that involves the elements of commercialization and non-price competition.

In particular, the State Material Office should be more flexible in public procurement because it is a State Economic Enterprise.

Because the State Materials Office is located at the intersection of entrepreneurship and SME policies where value added is present in the value chain as seen in Figure 8.2

SSO Techno Catalog Platform, developed by State Materials Office, offers solutions to branding and commercialization problems in public procurement. By providing

value suggestions to business models of entrepreneurs, they enable them to focus on the market at the idea stage.

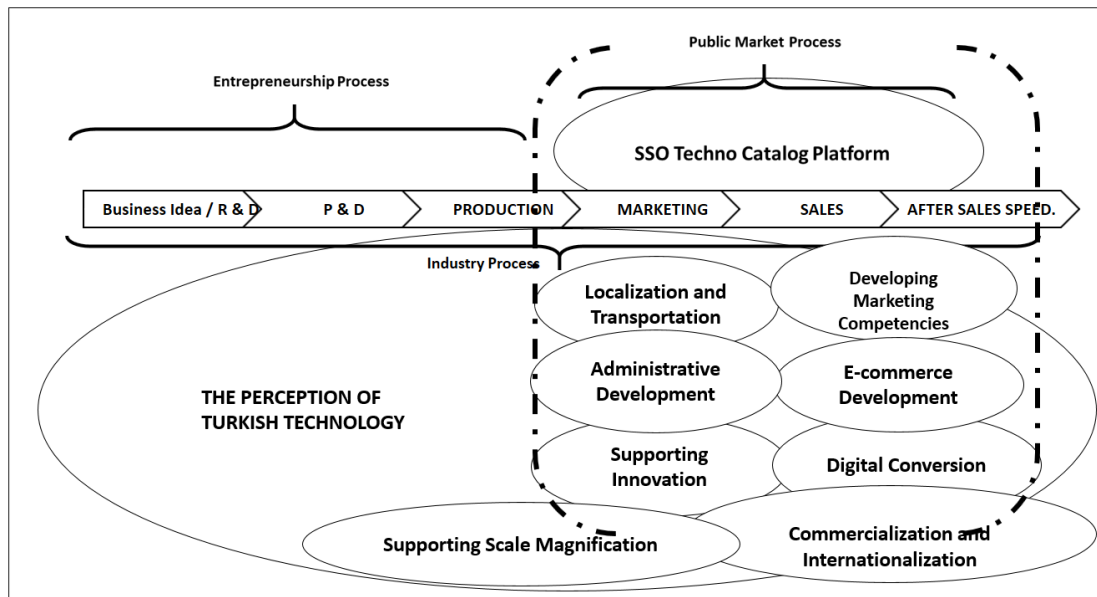


**Figure 8.2** SSO Techno Catalog Platform Positioning in Value Chain

In fact, two words, commercialization and branding, are seen to contain very complex phenomena. Considering the fact that we are an ecosystem, which dominates the technical side especially in entrepreneurship, we have to develop our entrepreneurial ecosystem's marketing competence step by step.

Today, an entrepreneur's attempt to enter the SSO Techno Catalog Platform can be considered as a commercialization step. Because, for this platform, the entrepreneur has to pack the product, price it and position it according to the cost dynamics of that platform.

However; The SSO Techno Catalog Platform is in the core of a managerial decision process that requires a business model and a very important experience for e-commerce in the world trade. It offers opportunities for digital marketing and digital transformation for the entrepreneurial ecosystem that does not have a marketing infrastructure in the classical sense but uses digital platforms very well.



**Figure 8.3** Marketing Competency Creation Process

In order for a technology company to become an international brand, it will be much easier to reach the market of its own country, to make sales, to learn pricing positioning, in short, after it develops its marketing competencies. We see all these competency tools as a whole in Figure 8.3

SSO Techno Catalog Platform has to be integrated with export stakeholders and platforms in the ecosystem in order to achieve its export target. However, when a certain number of companies and products are reached on the platform, export should be placed on the platform as a requirement for entry and stay. For the future of our country, the entrepreneurs who are already established for the continuation of the ecosystem need to make sales, scale up and provide qualified employment through the SSO Techno Catalog Platform.

For this, SSO Techno Catalog Platform should be expanded. Native to Turkey Informatics Association-National Software Industry Report in this regard; The SSO Techno Catalog study offered by SSO is considered as a positive step to overcome these problems. However, it is necessary to encourage the evaluation of this catalog in the procurement processes of public institutions, rather than simply disseminating this catalog. In this context, it is stated that legislation arrangements can be made such as the recognition of price advantage to the catalog products in the purchases under certain amounts.

Along with all the work; In the solution proposal, it is necessary for the value chain which is the second stage to come together around the strategies and to define all stages in the value chain with the Technology Preparatory Level method. Only then, the public institutions that look at the different internal processes in the different ministries and in particular the different jobs can come together with the common language around the common goal. However, the value chain must be digitally monitored via TRL. A flow system can be created by placing doors between each step. At the end of the day, TRL 9 can be connected directly to the SSO Techno Catalog Platform. For an entrepreneur who has come to TRL 9 in digital environment, he / she will be able to take SSO to the system without any request and questioning of any documents.

In the end, it is aimed to ensure that public procurement which is included in the third solution proposal to be reached with the SSO Techno Catalog Platform and Technology Preparatory Level approach is handled with the understanding of technology management. If public procurement can be considered in the understanding of technology, then right entrepreneurship, SME and public procurement policies can be developed.

According to this technology management approach, our country needs to develop Intelligent Purchasing Models according to the picture and product groups. While savings can be tracked in a technology area where domestic entrepreneurs are concentrated, conservationist approaches should be adopted in the sectors where domestic firms are new. In Intelligent Purchasing Models; Models such as project sales, prioritization, purchase up to certain limits, tendering between domestic companies can be applied.

It should be taken into consideration the reflection on entrepreneurship ecosystem in policies such as purchasing.

The entrepreneurial ecosystem connected to the SSO Techno Catalog Platform, which is a common language with the Technological Preparatory Level that is being managed in the management of technology and which will eventually improve its marketing competence, should be equipped with smart incentive interfaces and policies. For example; Techno Market Support given by Small and Medium

Enterprises Development Organization (SMEDO) can be given to SSO Techno Catalog companies that have reached to the market automatically.

In R & D supports provided by STRCT, being a member of SSO Techno Catalog Platform may be a requirement of prioritization. Patented products can reach the public market directly via SSO Techno Catalog Platform. With all these, not only the entrepreneurial ecosystem of our country will develop. In the medium term, it will become a center of attraction in its geography. On the other hand, the SSO Techno Catalog Platform can be positioned as an international public procurement platform in the medium-distant (3-4 years) future.

The SSO Techno Catalog Platform identifies the micro-level problems of entrepreneurs at the bottom of the entrepreneurial ecosystem. It develops macro-level policies by solving these problems.

It is considered that SSO Techno Catalog Platform will contribute to the development of our country's entrepreneurship and may be an international public procurement platform where different countries can gather around fair share.

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