THE TRANSFORMATION OF ORGANIZED INDUSTRIAL ZONES IN TURKEY

Manisa OIZ Innovation Center's Design and Foundation

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Design and Foundation

Assoc. Prof. Dr. Mehmet Cansız

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REPUBLIC OF TURKEY
MINISTRY OF INDUSTRY
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With the introduction of innovation and digital technologies into our lives, we are experiencing a dynamic process of change in which traditional business methods are rapidly losing their validity. To adapt to this process of change, we have developed the Industry and Technology Strategy 2023, which focuses on developing National Technologies. Our goal is to make our country one of the world's leading production and technology bases. The steps we will take will increase our global competitiveness, make us economically and technologically more independent, improve value-added production methods and achieve breakthroughs in cutting-edge technologies.

The organized industrial zones of Turkey (OIZ) are among the most functional and successful initiatives brought to life by the industrial policies of the last 60 years. In the last 18 years, we have made ground-breaking achievements with respect to industrial zones, as in many other areas. We completed 120 OIZ projects between 2002 and 2020. Thus, we supported the start of production on 53,891 parcels in our current network of OIZ's employing around 1,950,000 people. Our goal for 2023 is to employ 2,500,000 people. We believe that we will achieve this goal with our strong industrial infrastructure, skilled human resources and companies with production flexibility and continue to make significant achievements in many different areas.

We will take the OIZ investments made so far to the next level. To this end, we have included the goal of establishing Innovation Centers in the Eleventh Development Plan and the Industry and Technology Strategy 2023. To achieve this goal, we have accelerated our efforts for the "Developing a Model to Improve Technology Use in OIZs Project", which is being implemented in collaboration with the Presidency of Strategy and Budget, our Ministry and the UNDP.

By establishing Innovation Centers (IC's) in OIZ's, we aim for OIZs to provide services for the new requirements of the information and technology society we are in the process of building and so develop ways of doing business. We believe that OIZs will play a more active role in the innovation-based economy of Turkey through Innovation Centers. With this publication, we are bringing to life the pilot project in Manisa OIZ. The Innovation Center to be established in Manisa OIZ will support businesses in the region concerning innovation, R&D, entrepreneurship and digitalization. A globally efficient industrial and technology zone will be created, which will boost Turkey's competitiveness. In the coming period, we plan to implement similar projects for other OIZ's, particularly those with complete substructure investments.

I would like to thank the Presidency of Strategy and Budget, the Department of Industrial Zones, the management of Manisa OIZ, the stakeholders of Manisa OIZ, the UNDP officials, the project team and the author of the study for their contributions to this critical project introducing innovative production methods that is set to make Turkey one of the leading economies in the world.

Mustafa Varank
Minister of Industry and Technology

For more than 50 years, the United Nations Development Program (UNDP) has worked with the public / private sector and non-governmental organizations to support development priorities of Turkey focusing on inclusive and sustainable growth, inclusive and democratic governance, climate change and environmental issues in the process. As a leading UN organization engaged with development projects, we support the steps taken by the Turkish government to achieve the Sustainable Development Goals (SDGs) under the 2030 Agenda.

We put innovation, gender equality and the green economy at the heart of our development agenda as the main drivers of inclusive growth on our path towards SDGs, drawn up to "leave no one behind". Through UNDP's new generation approach (@nextgenUNDP), we continue to build relationships with our partners at the highest level and solve global problems by developing innovative solutions.

We are conducting critical projects with the Ministry of Industry and Technology in the field of sustainable and inclusive growth, setting science, technology and innovation policies in line with economic development and social development objectives and industry policies and strategies of Turkey. Our joint efforts to implement the first R&D and innovation-oriented Cluster Support Program, implement the first integrated industrial development plan in Şanlıurfa, set up Applied SME Capability Centers with the aim of increasing the competitiveness and Productivity of SMEs, establish the Ankara Innovation Center Network and finally transform OIZ's to increase their role in innovation, entrepreneurship and technology development have progressed in a way that took our partnership to a higher level. UNDP is very pleased to be able to carry out these projects, which we believe will contribute greatly to the competitiveness of Turkish industry, in synchronicity with the Ministry of Industry and Technology.

This publication is a supplement to the master document "Transformation of Organized Industrial Zones in Turkey Towards 2023" drafted within the framework of the "Developing a Model to Improve Technology Use in OIZs Project" prepared in collaboration with the Ministry of Industry and Technology, the Presidency of Strategy and Budget and the UNDP.

This publication, prepared based on the objective of establishing Innovation Centers in OIZ's as referred to in the documents "Eleventh Development Plan" and the "Industry and Technology Strategy 2023", not only provides the strategy and roadmap for the design and installation of the Manisa OIZ Innovation Center, a pilot project, and the proposal for the pilot implementation, but also sheds light on how the OIZs, one of the most fundamental instruments of industrial policy, will be transformed to contribute to the innovation-based Turkish economy.

I would like to thank the Presidency of Strategy and Budget, the Ministry of Industry and Technology, the management of the Manisa OIZ, all stakeholders involved in the project, the project team and the author for their valuable contributions to the creation of this important strategy document. I hope that the efforts we have initiated to support Turkey's economic development agenda and achieve sustainable results can continue on a larger scale and deepen our partnership through new steps and initiatives.

Claudio Tomasi
UNDP Resident Representative in Turkey

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PREFACE AND ACKNOWLEDGEMENTS

Organized Industrial Zones (OIZs) in Turkey, designed around the concept of an industrial society, need to develop services / support mechanisms and business methods for the new requirements of a society and economy driven by information and technology. In other words, the transformation of OIZ's into innovative organizations such as enterprises is one of the most important agendas of development plans and industrial and technology strategies.

OIZs have made and continue to make a significant contribution to industrialization at the macro level, urban development at the mezzo level and business productivity at the micro level. Recently, interest in OIZ policies and practices has increased rapidly with the growing emphasis on regional ownership and industrialization in public policy. In addition, it is noted that important institutional capacity has been built in the areas of industrial policy design and implementation/development and consequently the budget allocated to this field has increased rapidly in recent years.

It is worth considering what can be done to increase the effectiveness of the regional innovation system in addition to the municipal services offered by the OIZ's, which are among the strongest structures in relation to the industrial potential of cities, and to allow them to contribute more to companies' competitiveness by supporting their R & D, innovation, entrepreneurship and digitalization initiatives. While OIZs are the primary bases of R & D and innovation processes in the manufacturing ecosystem, how true is it that they are not efficient enough to support these processes? What are the current affairs of other industrial zones in the world? How can OIZ's better support businesses and regional innovation systems in their regions alongside their other tasks? The Presidency of Strategy and Budget (previously State Planning Organization and the Ministry of Development) and the Ministry of Industry and Technology have been working intensively on these issues. "Developing a Model to Improve Technology Use in OIZs Project" was developed, which is being implemented by the Ministry of Industry and Technology and UNDP.

Under the project, the study "Transformation of Industrial Zones in Turkey" was published by the UNDP in 2019. It was understood that OIZ's are capable of responding to the productivity needs of companies operating in developed OIZ's, but that some OIZ's have their own independent support mechanisms and programs with regard to innovation and most of them are not sufficiently active. This guideline, based on the observation that some OIZ's are willing to contribute to companies in the field of innovation in addition to their traditional job descriptions, was received with enthusiasm and interest by various circles interested in the subject.

Afterwards, the pilot stage of the "Developing a Model to Improve Technology Use in OIZs Project" was initiated and it was decided to set up Innovation Centers in OIZ's. Within this framework, it was determined which OIZ's would be part of the pilot project and what criteria would be used when selecting them.

After the selection process was completed, this publication was finalized after conducting technical studies at Manisa OIZ.

Although it is easier to set up innovation centers in OIZ's, the efficiency and success of these centers involves a much more challenging process. However, the public will, the willingness and support of the selected OIZ's, requests from companies based in OIZ's and the international experience of UNDP facilitate the implementation of the project. It also offers the potential for a success thriving of innovation centers that may create opportunities for the transformation of OIZ's.

As a person who was educated professionally at the State Planning Organization (now called Presidency of Strategy and Budget), the school of development, planning, programs and projects that has achieved so much for this country, and who specializes in SMEs, entrepreneurship, innovation and industrial and technological zones, and takes this expertise further to an academic level and provides technical advice to various ministers and undersecretaries in these areas, sets the policies of the OIZ's for the last 20 years, manages their resources and is present at every stage of the project concerned, I am happy to practically contribute to this work on the field.

This publication is the first comprehensive study to establish an Innovation Center to transform OIZs with a specific capacity

and potential. Therefore, I think of it as a preliminary document that can be improved in collaboration with the public, universities, the business community and NGOs, and I also believe that, during the implementation phase, we might make further adjustments in terms of where we want to get at the end of our journey.

I would like to take this opportunity to thank those who have made invaluable contributions to the work at hand.

First of all, I would like to thank Mr. Mustafa Varank, Minister of Industry and Technology, for his vision and his contributions. I would also like to thank the General Manager of Industrial Zones, Mr. Ramazan Yıldırım, who has been involved with the OIZ Policies for almost 40 years and has continuously supported the project for the transformation of OIZ's from the very beginning to its current state.

In addition, I would like to thank the Head of Department Orhan Kılınç and the project expert Burak Reis Sat from Department of Industrial Zones, Yasin Öcal from the Presidency of Strategy and Budget, Yaşar Anıl Albayrak, Kısmet Deniz Çiftçi and Pelin Rodoplu from UNDP, for their support and understanding and for tolerating a detailed and holistic-thinking researcher like me.

I would like to thank all MOIZ Board members, especially Sait Cemal Türek, Chairman of the Board of Manisa OIZ, for their genuine support (financial and technical), professional awareness and the level of expertise they brought with regards to the transformation of OIZs and creating technological novelty. Based on the level of success achieved with the management of Manisa OIZ, I think it can contribute to the success of our National Technology Venture if industrialists and/or professionals with a higher awareness in this field who run R&D centers and/or who are engaged in R&D and innovation activities take more active roles in commercial chambers and stock exchanges as well as in the management board of OIZs, on a more specific level.

On the other hand, as someone who has been closely following the Manisa OIZ for years, I believe that Manisa OIZ manager Funda Karaboran is a figure not to be missed. I would like to thank her for her involvement in pre-pilot projects, technical and operational support for work with Manisa OIZs and her flair for constructive communication to ensure effective collaboration with the MOIZ management. Another achievement to her name worth mentioning is her efforts in bringing to life project ZEKİ, " Sheltered Workplace/Life Center for Mentally Disabled People", which is an extremely important initiative for encouraging social welfare and progress in Turkey.

If you analyze Manisa OIZ in detail, as I do, you can observe the difference a "Woman's Mind" make in all areas, from technical progress and innovation to environmental regulations, physical and social environments, empowered by the Board's competence, financial strength and openness to innovation. There are very few women in leadership positions, such as board members, directors and deputy directors, in the management boards of OIZ's. In this framework, I think it would be beneficial to involve more women in the management processes of OIZ's.

I would also like to thank the stakeholders of Manisa OIZ and our valuable workshop attendees from İzmir for their contributions to the study.

I would also like to thank Gülay Gedik Temizbaş, Nuri Yavan, Nuri Barış Tartıcı, Esen Çağlar, Aycan Yüksel, A. Mete Çakmakcı, Metin Karaçay, Ozan Acar, Sibel Ersin, Oğuzhan Üstün, Yavuz Cabbar and Çağatay Emrah Öngüt for their valuable insights and offers of help in overcoming bottlenecks along the way, besides their help with editing this work.

This project, which is part of a much larger transformation effort, has many stakeholders. I would like to thank all the institutions, organizations, industrialists, innovative entrepreneurs, start-ups and academics whose names I am not able to list here.

Finally, I would like to express my gratitude to my family and friends for their patience, understanding and love throughout this work.

I hope this work will deliver great results in terms of the progress of our nation.

Mehmet Cansız

EXECUTIVE SUMMARY

In the course of the transformation from an agrarian society to an industrial and information society, industrial and technology zones or exclusive economic zones are coming to the fore as an important instrument of industrial policy. Even though there are 4,500 examples of exclusive economic zones in the world, the number of truly successful cases is limited. In that regard, Ireland, Korea, China, Hong Kong, and some states in the USA stand out (Cansız, Kurnaz, Çağlar, 2019:11).

The Organized Industrial Zones (OIZ) that were first established in the 1960s in Turkey have played an important role in its industrialization. Industrial infrastructure problems were dramatically eliminated by allocating regular industrial areas for companies under suitable conditions; and the required services, such as roads, water, electricity, sewage, decontamination, and municipal works were provided via the OIZs.

Addressing the essential needs of the industry before the 2000's, OIZs today are founding and effectively operating logistical centers, technoparks, vocational high schools, research laboratories and centers, and model factories that are proportionate to their levels of development, and in line with the changing needs of industrialists.

However, as might be expected, it is not an easy task for OIZs and companies to turn towards problems within the industrial and regional innovation system, and transform their structures into one that will generate solutions to problems regarding R&D, innovation, digitalization, and the innovative class, when their business practices and skills are focused more on non-industrial areas like land, zoning, licensing, and municipal services.

In transitioning to a high-income economy, Turkey is going through a change from a cost-efficient and productivity-based competition mentality, to one that is based on innovation. Playing a crucial role in the development and productivity economy of Turkish industry, OIZs are now foreseeing the establishment of Innovation Centers (IC) in the forthcoming periods, in order to improve their new roles in an innovative economy. In this context, a multilateral initiative called "Developing a Model to Improve Technology Use in OIZs" was launched. The Manisa OIZ has been one of the regions selected for a pilot implementation.

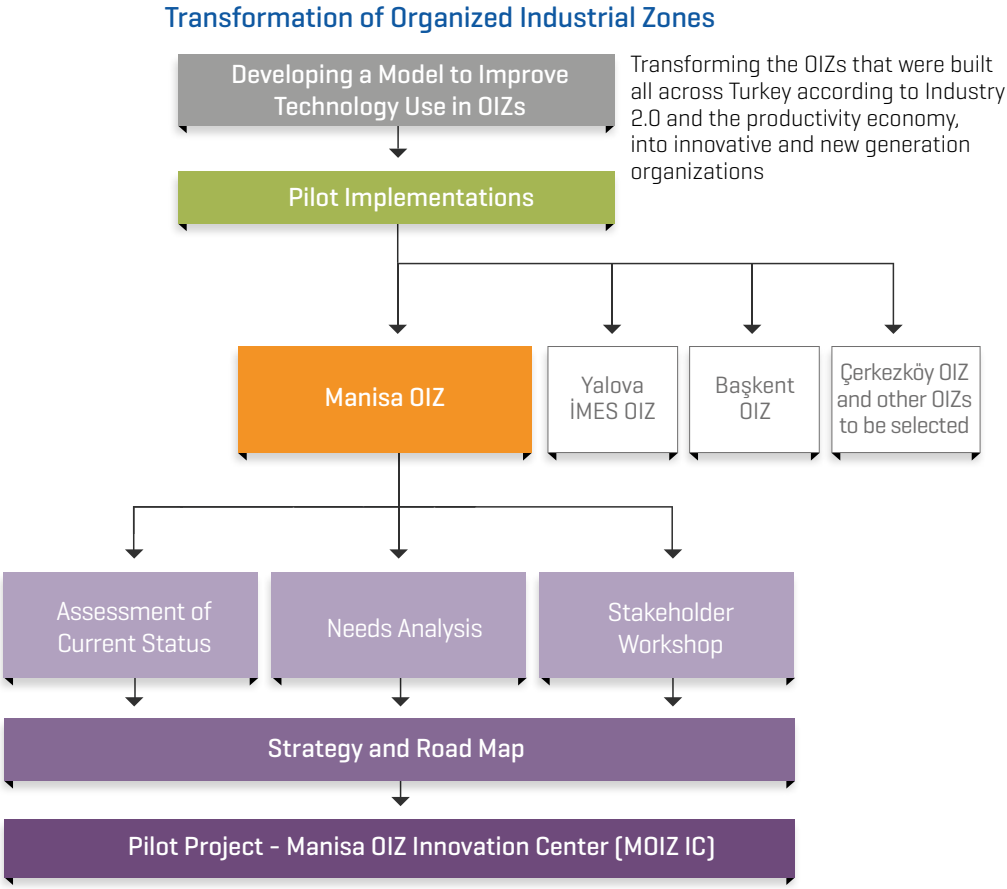
The general objective of this study is to transform OIZs into more activeand innovative institutions within the system, in order to develop a regional innovation system. The specific purpose of the study is to build an effective industrial and technological zone (exclusive economic zone) that supports companies by transforming the Manisa OIZ into an innovative organization, establishing an innovation center that will find solutions to problems in the fields of innovation, R&D, entrepreneurship, and digitalization which are experienced by companies in the region.

The criteria used in selecting the Manisa OIZ for a pilot implementation are broadly discussed below.

- The preparation and awareness level of OIZ management and directorate with regards to innovation, as well as their eagerness to undertake the project,
- The OIZ puts the previous criterion into action by allocating sufficient resources for the project (such as, human resources, financing and spatial allocations),
- Particular characteristics, such as economic and business capacities, as well as capacities to develop collaborations, develop joint projects, and to follow the latest innovations in their respective sectors, willingness to improve and the importance placed on innovation that are observed in the companies operating in the OIZ, especially those who have already started or advanced their innovation activities,
- Economic, social, and cultural interaction with Izmir as a regional advantage.

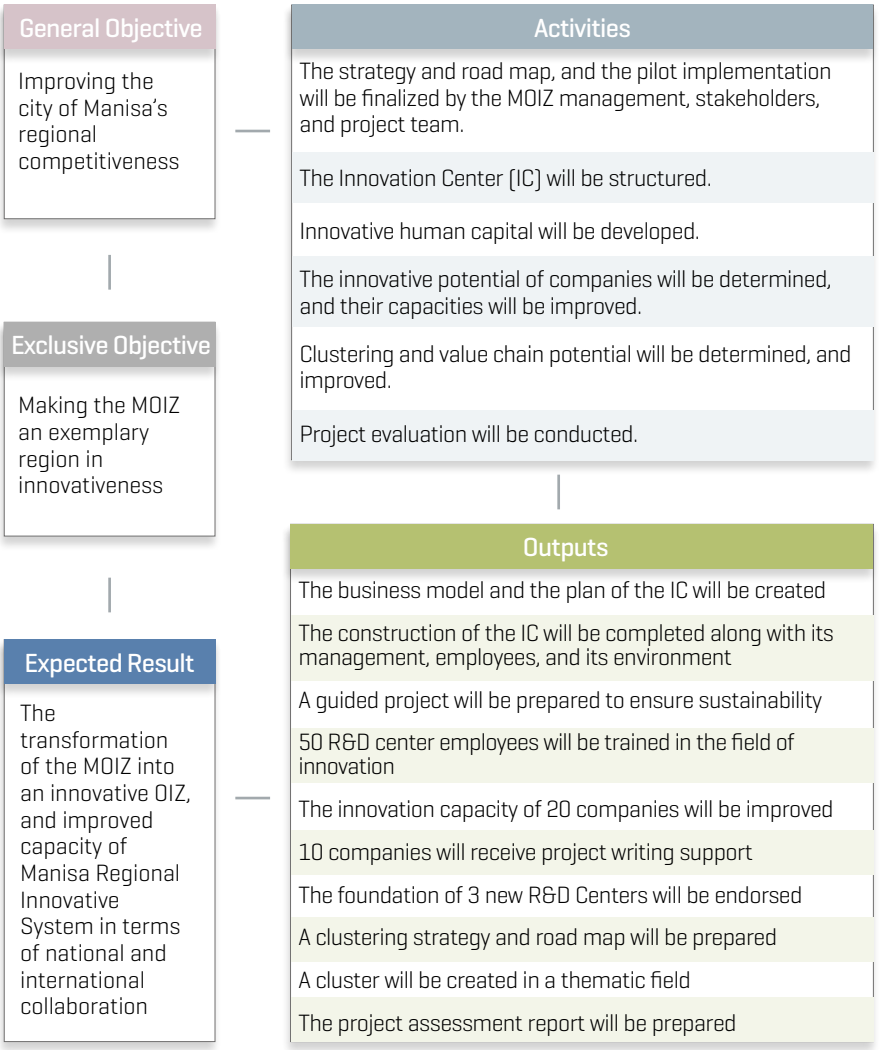
The stages of the project that aims to actualize the innovation-based transformation of the OIZs are summarized in Figure 1.

Figure 1 **Basic Stages of the Developing a Model to Improve Technology Use in OIZs**



In this framework, the basic intervention logic of the project can be summarized as follows.

Figure 2 **The Basic Intervention Logic of the Project**



In order to effectively structure the innovation center, an assessment of current situation, needs analysis, and innovation workshop were conducted, and then a strategy and road map, as well as the pilot project were prepared based on these initial undertakings.

Assessment of Current Status

Current status assessment includes office work, and is comprised of three different evaluations:

(i) An examination of the actors within the Manisa Regional Innovation System (MRIS) through available documents

(ii) A 12-year progress assessment of Manisa companies with more than 10 employees operating in the areas of manufacturing industry and information communication technologies industry using data from the Entrepreneur Information System (EIS), and looking at their positions and performances in comparison to the average in Turkey

(iii) Compilation of data that consists of the capacity of the Manisa OIZ, the provided services, and ability to meet industrialists' demands who are operating in the region

The city of Manisa ranks 23rd in Turkey in terms of socio-economic development. Manisa is in a higher position with regards to economic activities, employment, and competitive and innovative capacity; however the ranking is low in quality of life, health, and education conditions. On one hand Manisa is known to be an important industrial city, while on the other hand, the influence of agriculture in the city is apparent both in economic and social life, influencing work life whereby industrial workers are leaving their jobs to engage in agriculture, as well as the behaviors of industrialists and merchants.

The progress that the Technopark has made and the foundation of the TTO in recent years demonstrate that there is an increase in activities that aim for university-industry collaboration. However, other than a central lab, the university still lacks advanced capacity to offer high-level services to industry.

On the other hand, it is possible to see some of the exclusive tests, analysis, technology and product development projects that are brought in to the Technopark via guided projects endorsed by the Development Agency as crucial steps towards improving university-industry collaboration.

Nearly all of the 32 R&D Centers in Manisa are located in the Manisa OIZ. While it is important to enhance R&D Centers' collaboration and communication amongst each other, as well as with other actors in the innovation ecosystem, inadequacies still exist in the areas of information sharing, participation in national and international project markets, joint project development, development of collaboration prior to competition, and specifically, commercialization. The comparatively superficial stance of MRIS, and the weakness of business to business relationships have negatively influenced the establishment of industry clusters; so it would be beneficial to follow the developments in sectors that show potential in this matter.

Looking at company performances in Manisa, it is safe to say that (i) when it comes to technology, production in Manisa tends to shift towards medium-high and medium-low

technology sectors compared to high technology areas, (ii) companies tend to downsize in terms of their number of employees, (iii) when it comes to R&D and innovation activities, high technology sectors are experiencing a reduction, companies in medium-high and medium-low technology sectors are embracing different strategies, for instance, some companies are more intense with their R&D expenses, hoping to gain competitive power, while others pursue a productivity and price-focused competitive strategy without any R&D works.

Generally being shaped around productivity and price competition, company strategies may fail to succeed in the emerging competitive conditions where production is digitized and retransformed. Within this period, it seems crucial for Manisa's economy to re-enter the development cycle, and for companies to take on the foresight and capacity that can switch to innovation-based competition strategies. Having said that, the absence of structures that would facilitate this process, and improve companies' access to the information and resources that they need is very much felt in Manisa.

On the other hand, Manisa OIZ has won the hearts of industrialists not only with its infrastructure but also with the services it provides, and it is among a few leading OIZs in Turkey in terms of services for the productivity economy. However, the tools and actors of the regional innovation system like the TTO, technopark, business incubator, common R&D center, common R&D lab and common test and analysis lab do not exist in the OIZ.

One of the most basic matters for Manisa is the necessity to construct a relationship with Izmir, based on a win-win strategy, rather than on a fruitless competition. These two cities enjoy close interactions in terms of economy, and Izmir streamlines Manisa's access to social opportunities, commercial relations, international ports and air transport, and institutions that provide specialized services. At the same time, the majority of white collar and innovative employees working for Manisa's industry are coming from Izmir on a daily basis.

Needs Analysis and Manisa OIZ IC Workshop

In order to provide a basis for the foundation of the IC, and to showcase stakeholder views specifically in Manisa, followed by those in Izmir, the following activities were conducted;
(i) a needs analysis that features 36 in-depth interviews and Likert Scale assessments with participants, including executives from universities, industrial and public sectors, entrepreneurs, academics, and MOIZ and Technopark officials,
(ii) a 50-people workshop with participation from industrialists, tech-based entrepreneurs, start-ups, R&D Center managers, OIZ managers, public officials, and academics, as well as representatives from Izmir.
Stakeholders broadly view MRIS' general performance as intermediate,

while they consider that local governments, clusters, and KOSGEB are among institutions that should improve their performance the most.

Institutions whose performance is most recognized by stakeholders have been the Zafer Development Agency, Manisa OIZ, and Manisa Technopark, respectively. On the other hand, stakeholder evaluations reflect the need for a general improvement in corporate capacities and business skills of actors in the ecosystem.

Stakeholders have varying opinions on whether the IC should specialize in particular sectors or go for more general subjects. However, the opinion that gained more importance was that the IC should focus on particular sectors in order to obtain results in the short term and be acknowledged by demonstrating its influence. As for medium and long-term goals, it was suggested that a focus on cloud technologies, artificial intelligence, and digitalization that intersect most sectors would be a much more appropriate approach.

Functionally, areas of focused work that will shape the IC's operations, as highlighted by stakeholders, are skills development, innovativeness, business development and coordination, respectively. Considering the topic in terms of the IC's capacity for development and companies' tolerance for more complex works regarding innovation management, a short-term focus on the first two functions, and then adding the latter two to IC's service portfolio in the long run was suggested.

Table 1 Manisa OIZ IC Framework of Functions

Short-Term	**Skills Development** Establishing network relations and developing trust and collaboration among actors through clusters Improving technical skills, as well as skills of R&D personnel	**Innovation** Improving R&D, innovation, entrepreneurship and digitalization capacities Enhancing the OIZ's corporate and innovative capacity
Long-Term	**Business Development** Developing collaborations between R&D centers and companies Improving collaborations between industrialists and startups for commercialization	**Coordination** Providing access to Izmir and other developed cities, and to the international arena Facilitating access to platforms and interfaces

Administrative points that are considered significant by stakeholders in terms of the IC's priorities and achievement of functions are summarized in the table below. Topics that predominately stand out regarding the IC's qualifications are the need to be complementary rather than repetitive for the institutions in the ecosystem, and having the ability to gather skills that are flexible, adaptable, and able to develop network relationships. In that regard, emphasis was placed on building the identity of the IC as an institution that holds a set of skills that are capable of managing trustworthy and collaborative relationships among businesses through innovative transformation projects.

Table 2 **Manisa OIZ IC Administrative Topics**

Administrative Topics	Stakeholder Priorities
Status and Management	■ Being part of the MOIZ in the short term, while achieving independent management in the medium-long term ■ Building close relationships with actors in the ecosystem, and being able to negotiate with them ■ While company status is a priority, consideration of cooperative and foundation structures and their partnership setup
Skills	■ Coordinating, flexible and agile corporate structure: Adaptation to the changing conditions of competition and industrialists' demands, ability to keep up with, interpret and adapt to change, ability to combine different resources ■ A personnel structure that is capable of bringing different skills together ■ Personnel that know the industry well, with strong communication and organization skills ■ Establishment of a pool of mentors consisting of experienced individuals alongside permanent personnel
Location	■ Foundation stage: MOIZ Location ■ Depending on the success and performance, positioning alternatives with structures, such as business incubator, Technopark, and joint lab that will presumably be built within the MOIZ
Financing	■ Short-term government aid and financing of the MOIZ ■ Self-financing in the long term

A general overview of stakeholder opinions shows that significant weight is given to the initial foundational period of the IC. Considering the future need for the IC to gain corporate support and reputation, as well as resources such as financing and work areas, it is suggested that the IC should be an institution that will have a distinct and flexible structure in its development during the foundation period and will be set up within the OIZ. This period is also anticipated as one in which the IC will start bearing fruits by improving its skills, and therefore being acknowledged among the actors of the ecosystem.

The idea is that in the medium and long term, the IC will advance its skills, professionalize, and be able to price out a significant portion of its services, which will make self-reconfiguration possible via its own independent management and self-financing.

Strategy and Road Map

In line with the stakeholder opinions and expectations, the strategic framework and action plan regarding the IC are both designed in a way that is capable of being complementary with the current institutions and interfaces, and of addressing the transformation, development and growth needs of the industry. This strategic framework that will influence functions, organization, working style and culture of the IC is summarized in the table below.

Table 3 **Strategic Framework of Manisa OIZ IC**

Motto	Bringing Together Production and Innovativeness Within Manisa OIZ
Vision	Making Manisa OIZ One of the World's and Turkey's Most Recognized Industrial and Technological Zones in the Area of Innovative Production
Mission	Enhancing R&D and Technology Capacities and Accelerating the Digitalization Processes of Companies Operating in the Region by Developing an Innovative OIZ
Functional Areas of Focus	**Short Term:** Skills Development and Innovativeness **Medium-Long Term:** Development of Coordination and Business in addition to Short-Term Operations

Actualization of the IC involves the gradual establishment of a center by means of short-term minimal structuring, and the implementation of the pilot project. As will be explained in detail shortly thereafter, the pilot implementation is especially important in terms of its focus on skills development and innovation topics.

In the medium term, the IC's foundation is planned to be entirely complete. Over time, the IC is expected to become one of the key elements of the Manisa OIZ and MRIS by institutionalization, and becoming integrated with the main elements of the ecosystem. In the long term, however, the aim is for the IC to maintain its operations towards the primary needs of companies in areas of skills development, collaboration, innovativeness and coordination, in order to advance the Manisa OIZ companies' capacities in innovation and digitalization.

Pilot Project

For the purpose of materializing the IC's initial structuring in the foundational period and advancing the innovation capacities and skills of Manisa companies, a pilot project will be implemented. The IC will contribute to the Manisa OIZ's development of corporate capacity in the short term, and to its transformation into an innovative OIZ in the medium and long term.

The general purpose of the pilot project is *to enhance the regional competitiveness of the city of Manisa,* while its exclusive purpose is *to develop Manisa's regional innovation ecosystem*. The pilot project will focus on the development of innovative capacities of the Manisa OIZ, and other companies to be selected for the project implementation, with regards to (i) skills development, and (ii) innovation that were primarily determined for the short term within the scope of the IC Strategy and Road Map (SRM). In this regard, there are three expected outcomes of the pilot project:

1. Establishment of a corporate infrastructure of the regional innovation ecosystem
2. Development of innovative capacities of institutions and companies operating in the region
3. Creation of clusters identified in Manisa's innovation ecosystem

Pilot project operations will be identified during the implementation stage, within the framework of these three expectations that were determined during the preparation stage. The detailed operation plan of the pilot project will be drawn from principles of change-orientedness, holistic approach, task-orientedness and sustainability, which were identified in this study. In other words, the process designs will be anchored in these four principles. These principles establish the general framework that will enable an effective and productive planning of operations, in line with the objectives of both the funding institutions and the beneficiary companies. Furthermore, Table 4 is prepared within the framework of capital theory, in order to guide the implementation plan by means of classifying possible intervention areas with regards to the capital elements.

Anticipated to continue for 18 months, the project's total budget is TRY 8 million; and according to the plan, half of this amount will be covered by Public Investment Program, while the other half will be met by the Manisa OIZ and other beneficiary companies.

The IC will be established in the initial stage of the project, and during

the second stage, the planning and preparation processes will be undertaken. Meanwhile, activities within the OIZ specific to the companies will be planned, and companies that will be included in the innovative capacity development project program will be identified. The final stage will include the implementation of activities for the development of innovation capacity and skills both throughout the OIZ and within companies. The project will be carried out by the Manisa OIZ IC and UNDP under the leadership of the Ministry of Industry and Technology. In addition, the Manisa OIZ, the University, Technopark, TTO, Development Agency, and KOSGEB Provincial Directorate will participate in the Guidance Committee of the pilot project.

Table 4 **Critical Factors of Capital in the Development of Innovative Capacity, and Pilot Project Interventions**

	Components of Capital	Pilot Project Interventions/Services
Human Capital	■ Qualified human resource, R&D employees, employee level of knowledge in innovation and R&D, employee skills in technology development and commercialization, and employee entrepreneurship capacity	■ Education and consultation services towards company-based needs ■ Skills development training for R&D and technical personnel
Social Capital	■ The level of collaboration with research infrastructures, networks, and platforms where the company is a participant, as well as universities, other companies, start-ups, and other the actors in the ecosystem with which it engages in joint operations	■ Programs among R&D Centers that are built towards the development of relationships with the regional and national-level actors ■ Activities towards the internationalization of companies, and their integration to regional (such as Izmir), national, and global value chains ■ Education, seminars, and business network development activities in the Manisa OIZ
Economic Capital	■ Financial resources used for operations of innovation ■ Level of benefiting from assistance for R&D expenses and investment, number of projects, innovation infrastructure and location, machine-equipment-gears park and Intellectual and Industrial Property Rights, and R&D and innovation	■ Guiding companies towards relevant government aid, consultation ■ Guiding companies towards other national and international funds
Cultural Capital	■ Innovation culture ■ Level of institutionalization, vision, strategy and policy of R&D and innovation, openness to learning, knowledge absorption/intake capacity, inclination towards open innovation, innovative management and leadership, importance given to R&D	■ Education, seminar, business network development activities, and awareness creation for all companies in the Manisa OIZ
Relational Capital	■ Company achievements in innovativeness and R&D by means of making connections between other capitals, and its organizational skills in this matter	■ Identification of company-based needs, creation and implementation of innovation strategy/action plan

INTRODUCTION

Manisa OIZ

In transitioning to a high-income economy, Turkey is going through a change from a cost efficiency and productivity-based competition mentality, to one that is based on innovation. In order to accelerate this transformation; innovativeness, R&D, entrepreneurship, and digitalization are among the featured policies in Turkey.

The primary policies in these matters are, (i) improvement of resources geared towards the purpose of improving entrepreneurship ecosystems and reinforcing regional innovation systems; (ii) strengthening of organized industrial zones (OIZ), technoparks, technology transfer offices (TTO), and research infrastructures; (iii) endorsement of innovative projects of companies through clustering activities.

The OIZs that were first established in the 1960s in our country have played an important role in the industrialization of Turkey. The infrastructure problems of the industry were dramatically eliminated by allocating regular industrial areas for companies under suitable conditions; and the required services, such as road, water, electricity, sewage, decontamination, and municipal works were provided via the OIZs. Addressing the essential needs of the industry before the 2000s, OIZs today are founding and effectively operating logistical centers, technoparks, vocational high schools, research laboratories and centers, and model factories that are proportionate to their levels of development and in line with the changing needs of the industrialists. However, as might be expected, it is not an easy task for OIZs and companies to turn towards problems within the industrial and regional innovation system and to transform their structures into ones that will generate solutions to problems regarding R&D, innovation, digitalization, and innovative class, when their business practices and skills are focused more on non-industrial areas like land, zoning, licensing, and municipal services.

The general objective of this study is to transform OIZs into more active innovative institutions within the system, for the purpose of developing a regional innovation system. The specific purpose of this study is to build an effective industrial and technological zone (exclusive economic zone) by transforming the Manisa OIZ into an innovative organization, establishing an innovation center that will find solutions to problems experienced by the companies in the region like innovation, R&D, entrepreneurship, and digitalization, and support them.

The 11th Development Plan (2019-2023) indicates the foundation of Innovation Centers (IC) in OIZs in completing the macro policies towards industrial transformation. It is anticipated that the ICs will provide services to companies in the areas of entrepreneurship, digitalization, R&D, and innovation, and therefore make specialized services easily accessible to these companies. The 2023 Industry and Technology Strategy emphasizes that the ICs will be focusing on the Small and Medium Sized Enterprises (SME – KOBI in Turkish). Furthermore, the strategy targets ICs to develop collaborations with the other stakeholders in the innovation ecosystem with the

purpose of transforming OIZs and the manufacturing industry.

"Moving Towards 2023 Transformation of the OIZs in Turkey" has been published as part of the Technology Development Project in the OIZs that started in 2016. It was implemented in parallel with the 11th Development Plan and the development of policies in the area of OIZ transformation in Industry and Technology Strategy. All of these projects were concertedly carried out and implemented in compliance with public policies.

The general objective of the "Developing a Model to Improve Technology Use in OIZs" is to develop a model that will activate the roles of Organized Industrial Zones in the areas of entrepreneurship, innovation, and technology development, and to contribute to Turkey's competitiveness by enabling the OIZs to become more efficient through the applications in the project. In that context, the foundation of Innovation Centers is planned in order to effectively materialize this anticipated transformation, and for that purpose, pilot OIZs are selected. Three different sets of criteria were used in this selection for the pilot project: innovation capacities of the companies in the OIZ, potential of the city and its immediate vicinity, and the management, innovation, and financing capacities of the OIZ.

With the world's changing and transforming conditions, the presence and improvement of not only the companies, but also the ecosystem that supports them become a defining factor for the competitiveness of regions. In that sense, it is critical that the OIZs that focus on economic production activities improve the services they offer to companies, as well as their corporate capacities.

Accordingly, the Manisa OIZ has become one of the pilot regions selected for the establishment of an IC for the purpose of transformation of the OIZs in Turkey.

The criteria used in selecting the Manisa OIZ for a pilot implementation are broadly discussed below.

- The preparation and awareness level of OIZ management and directorate with regards to innovation, as well as their eagerness for the project,

- The OIZ puts the previous criterion into action by allocating sufficient resources for the project (such as, human resources, financing and spatial allocations),

- Qualifications of companies operating in the OIZ, especially those who have already started or advanced their innovation activities, such as economic and business capacities, as well as capacities to develop joint projects, to follow sectoral innovations, their will to improve, and the importance they give to innovation,

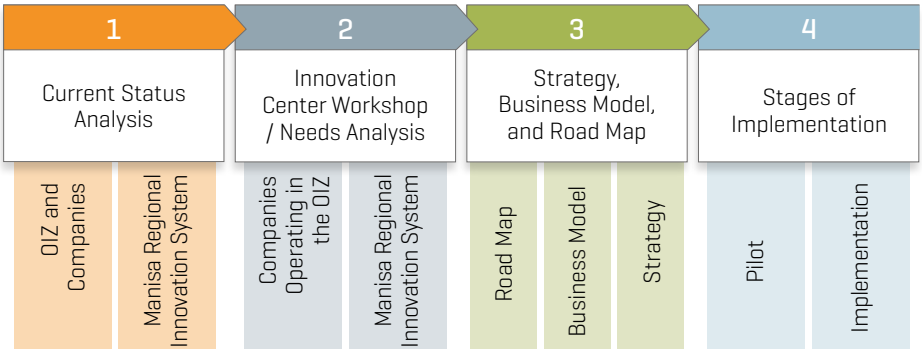
- Economic, social, and cultural interaction with Izmir as a regional advantage.

This study defines the conceptional and functional framework of the foundation process of the MOIZ IC. The study first analyzed the transformation of industrial and technological zones in the world and in Turkey from a theoretical perspective. Then, desk-based and field studies were conducted in order to answer the question, "How can Manisa OIZ be transformed?" These studies are shown in Figure 3 under four main titles.

The study begins with an assessment of the current situation, discussing the basic features of Manisa's economic geography from an industrial production perspective. In this section, the general economic structure and the actors of the region are considered in terms of "Manisa Regional Innovation System" and "the Manisa OIZ".

Initially, an assessment of the current status was prepared for the MOIZ IC. In this context, actors of MRIS, and the activities and capacity of the OIZ were evaluated; and then the transformation of companies over the span of 12 years were examined using Entrepreneurship Information System (EIS) data.

Figure 3 **Foundation Process of the Manisa OIZ IC**



The assessment of current status was followed by a needs analysis, based on the conclusions of the workshop carried out with stakeholders of MRIS, the in-depth interviews conducted with 30 companies operating in the OIZ, and the 6 MRIS actors in addition to these stakeholders. The workshop sought answers to questions like, "What should the MOIZ IC do? What shouldn't it do? What should its structure be?", while in the second stage, one-on-one interviews, conducted with mostly companies, have reevaluated these questions, as well as the performance of MRIS actors.

The Strategy and Road Map (SRM) for the Manisa OIZ IC is based on the background documents mentioned above. The strategy and road map elaborate on the previously defined short-medium term objectives and operations, and established short-medium term objectives and operations in a more flexible and guiding manner to enable a review of them following the experiences of the implementation of the foundational period. Complementing the minimal structuring of the IC in the short and medium term, the road map for the IC includes a pilot project implementation in areas that are considered as priorities to transform the OIZ.

In the final section of the study, a pilot implementation project is presented in the predetermined, prioritized areas, and in terms of the IC's foundation period. The project, which was prepared for the purpose of improving companies' innovative capacities, will continue for 18 months. Then, the knowledge and experience gained from the pilot project will be used to transition the MOIZ IC to the implementation stage.

1 HOW TO TRANSFORM THE OIZs?

Theory, and Its Implementations in the World

Manisa OIZ

This section discusses the transformation of industrial zones, the role of industrial zones in regional innovation systems, and the transformation of the OIZs within the framework of information economy and digitalization.

1.1. Transitioning to Industry 4.0 and Information Economy: Transformation of Industrial Zones

Being used as critical tools for public policy in the process of transitioning from an agricultural to an industrial society, industrial zones maintain their existence in the process of information and digital society by undergoing significant transformations on a global scale.

The concept of industrial zones is defined as "industrial parks" in the arena of politics, or as "organized industrial zones" (OIZ) in Turkey; while the concept of regions of technology was translated into the public policy jargon as "technopark" or "technocity". "Technology regions" as a concept evolved relatively much later than the industrial zones and emerged as a result of applying the concept of industrial zones into areas of science, innovation, and technology. The terms OIZ and technopark correspond to industrial and technological zones respectively and have become functional concepts for policy makers to use in development, industrialization and technological improvement strategies.

The concept of industrial zones has, in time, changed its content. Industrial zones were created in the late 19th century, to address the developments in the industry (Cansız, 2010:17). At first, industrial zones referred to the self-developed, natural, irregular industrial regions in major industrial cities as a product of the industrial revolution. However, with the start of the 20th century, they became a tool for industrialization policy, and were adopted all over the world, albeit under different names ("industrial park" in some countries, "industrial complex" and "business park" in others, or in some as "entrepreneurship zone/region" and "economic zone/region"), and put into practice publicly as a tool for planning, guiding and developing the industry. Following the industrial zones, technological zones became widespread under the names of "science and technology park" in some countries, "science park", "research park", "innovation center" and "technocity" in others, and were placed at the center of innovation policies implemented by governments and regions specifically, after 1990.

The most common approach today is to verbalize and define the new generation of industrial and technological zones as "Exclusive Economic Zones". New generation exclusive economic zones are differentiated from the old generation exclusive economic zones as it appears that first generation industrial zones were located in isolated regions, where industry was attracted to cost advantages through cheap and relatively unqualified man power and available infrastructure, government was aiming at creating employment and facilitating exports by offering financial incentives and

various privileges to domestic and especially foreign companies, and local connections with companies in the region were weak, and the contribution to the regional economy was relatively low.

New generation zones are seen as entities that both connect with global value chains and have tight integrations to their local/regional business environment and companies, who are engaged in production, as well as innovative activities. Therefore, in the economic development model based on productivity and dominated by a traditional Fordist production structure, industrial zones and technoparks mainly had the function of "providing infrastructure", while in today's knowledge-based economic development model, successful zones have undertaken new generation functions, such as "technological development and innovation activities". This way, the new generation industrial zones focus more on a physical and corporate environment that involves medium and high technology companies in manufacturing industries. In that regard, the new generation industrial zones come to the forefront as regions that offer a specialized first-class infrastructure, and supplementary services (such as, workforce education programs, interfaces that support technology transfer, mechanisms that strengthen companies' back and forth connections to the market on a wide scale, social services, and collaborative structures). Consequently, the expectations and demands of today's companies and entrepreneurs have changed, and a need for new generation industrial zones that contain well-equipped, specialized services like high technology zones arose. The designs of both the industrial zones and technological zones in developing countries are essentially modelled after the most successful zones in developed countries. Based on the few successful industrial and technological zones in the world, these zones have demonstrated a high growth performance, caught up with high technology competitive power, created employment and welfare, and became the success stories of local development, and therefore became models for public policy makers.

Important policy lessons are taken from the 50 years of "exclusive economic zone" implementations in the world. Looking at implementation examples across the globe, it is possible to count 4,500 exclusive economic zones, but truly successful stories are scarce. These important lessons to take from successful zones include improvements in R&D and innovation, exports, employment, and foreign investments; advancement of workforce skills and managerial staff, technology transfer, back and forth connections, demonstration effect, diversification of exports, and increase in knowledge on foreign markets (Cansız, Kurnaz, Çağlar, 2019:11).

The "new industrial zones/focuses" that set examples and are cited as models across the world include the Shannon FreeZone of Ireland as the very first implementation example in world, implementations in Hong Kong, as well as China's Shenzhen region, Incheon in Korea, Emilia-Romagna

Region in Italy, also known as the "Third Italy", the Baden-Württemberg region in Germany, Rhone-Alpes in France, West Jutland in Denmark, Southwest Flanders in Belgium, Sinos Valley in Brazil, and Kumi-Ansan in South Korea.

In terms of technological zones, regions like the Silicon Valley and the Route 128 Corridor in the United States of America, Cambridge Science Park in England, Sophia Antipolis Technology Park in France, Tsukuba Science City in Japan, Hsinchu Technopark in Taiwan are recognized among the good implementation examples that include high technology sectors, and where creative entre preneurship and innovation come together.

Some examples, like the Silicon Valley are zones that are majorly dependent on high technology sectors, and most zones are production regions specialized in traditional sectors. The basic factors that underlie these industrial and technological zones are as follows:

- A production structure in the form of small-scale businesses that are specialized in particular sectors according to a Post-Fordist flexible specialization system

- Clustering in a geographically particular, spatial area

- Intense collaboration, information sharing, networks of solidarity and trust among companies

- Qualified and flexible local workforce

- Common institutions and a regional culture supportive of entrepreneurship and innovative activities

These successful industrial and technological zones, also known as "new production areas" have a common local entrepreneurship culture, socio-cultural language, values and behaviors, in an environment that facilitates the spread of localized knowledge via intense, face-to-face relations and trust networks that ensure a creative maintenance of all these connections which build and interconnect these bonds. These characteristics are defined as the internal success factors of the abovementioned zones. The emergence of the industrial zones, Silicon Valley in the United States, Cambridge Advanced Technology Zone in England, Emilia-Romagna Region in Italy, and Baden-Württemberg in Germany as a globally successful industrial and technological clusters; and the incredibly high growth rates, innovative performance, and competitive power of these regions have brought about enthusiastic research studies to identify the factors that created success, as well as the operating mechanisms in these geographies.

The performance of the abovementioned successful industrial and technological zones has been influential in the use of clustering as a political tool all over the world, for the purpose of improving industrial competitive levels. As the focus of public policies shifted towards this

area, several research studies began to appear on how industrial clusters have emerged and developed (natural, self-developed organic clusters), and on how governments can motivate the current industry to cluster (artificial clusters created by the hand of the government).

Even though the academic origin of industry clusters dates back to Marshall's studies on "industrial regions" in the 1890s, the actual revival on clustering began with Michael Porter's 1990 study published on the competitive advantage of nations. Following Porter's detailed 1998 study on determination of industry clusters and their mechanisms, clustering became widespread all across Europe, the USA, and Asia as a fundamental industrial and competitiveness policy, while industrial cluster models and strategies became the main agenda items. According to Porter (1990), industry clusters are "geographic concentrations of interconnected companies, specialized suppliers, service providers, firms in related industries, and associated institutions in particular fields that compete but also cooperate." According to this definition, an industry cluster has three basic features:

1- Clusters occur through geographic aggregations:
Businesses in geographically different locations cannot create clusters even though they are related to and in relation with each other. Therefore, clustering is the totality of production activities aggregated in a particular geography based on a chain of values, as well as the economic and social system that supports these activities. Even though the borders of this aggregate geography are highly controversial, the generally accepted definition points to a geography where a car can travel from one end of the cluster to the other within an hour. According to this definition, clusters exist within a circle of 60 km radius in general. Therefore, in countries with wide geographic area like Turkey, it is not possible to talk about national clusters. Clusters are inherently regional.

2- A cluster is the diversity of the actors within:
The spatial aggregation of institutions and establishments that are active in various areas such as interconnected companies, suppliers, education and research institutions, government organizations, is one of the fundamental pre-requisites of cluster formation. However, the aggregation of different actors in the value chain, and supplemental organizations within a region, does not guarantee the presence of a cluster within the scope of the said value chain in that region. This assessment brings us to the third characteristic.

3- A cluster is the close relations among actors or their mutual dependence:
In order for a geographic aggregation to qualify as a cluster, the presence of actors is a required condition, even though this alone is not sufficient. The

intensity of collaborative relationships among actors aggregated within a given geography is one of the most crucial criteria that enables us to identify such aggregations as clusters. This intensity of relationships is expected to create an ecosystem among actors, based on trust and collaboration. Innovativeness is a product of such ecosystem.

Clustering is sometimes replaced with the term industrial zones. However, Porter and Ketels (2009) summarize the difference between these two concepts as follows:

- Industrial zones are generally comprised of small and medium-scale businesses that are jointly positioned and operate in the light manufacturing sectors of the economy. Clusters, on the other hand, are a more comprehensive definition that includes the probable and various different combinations of businesses and institutions of different scale and characteristics.

- Principally, industrial zones ensure their economic activities through flexibilities in the local regulations for outsourcing and production, taking advantage of their locations and the social fabric of their environment. Clusters achieve their activities through relationships that nurture productivity and innovation, dependencies, and dissemination of information.

The concept of a network structure is another definition that every now and then replaces clustering, just like industrial zones. Porter (1998) defines the term cluster as a form of network structure, while at the same indicating their differences: A cluster is formed via commercial and non-commercial close relationships/interactions or mutual dependence among various actors like companies (businesses and suppliers), organizations that produce information (education and research institutions), interfaces (consultancy service, and various facilitating organizations), and customers within the cluster. In that regard, "geographic proximity" and "relationship networks-interaction" are the two fundamental conditions of being a cluster.

A network structure is a system or structure that connects actors of equal level of positions, and allow them to benefit from economies of scale within a relationship network, as a result of various opportunities and collaborations in an environment that is dominated by long-term collaboration, mutual trust and understanding among different parties/stakeholders (Durgut, 2007). Network structures can be intentional and official interactions (such as, partnership relations, know-how exchange, protocols, official membership unions, commercial unions, or network structure groups, etc.) among organizations that collaborate, as well as unintentional and unofficial interactions (such as, agreements based on common learning and trust, geographic proximity, etc.).

1.2. Innovation Models: OIZs in the National and Regional Innovation System

Innovation can be defined as improving what is available, or emergence of new things in goods, services, processes, technology and organization. To better understand innovation, it will be beneficial to look closely at "linear innovation" and "innovation system" models.

Linear Innovation Model

The linear innovation model depends on formal R&D function that is based on scientific research, high technology and engineering know-how. In this model, the innovation process is performed separately from other departments of the company, in strictly defined stages in different departments, from the research lab to the production line, from the marketing department to the retail point-of-sale. Dominant until the 1990s, the linear innovation model and policy focused on R&D infrastructure, provision of financial support to companies to innovate, and acceleration of technology transfer. "Innovation" in the linear model is an approach that majorly focuses on the R&D investments in the R&D units, and centers around big companies within a relatively isolated environment mostly within the company (Yavan, 2018).

While innovation policies in this model focus on innovation inputs and support tools, the assimilation capacity of companies and the required conditions for innovation and technology development in underdeveloped regions are neglected. Furthermore, topics like managerial dimensions of innovation and development, as well as organizational deficiencies and capacity requirement observed especially in SMEs are generally ignored in this model (Cornell University, INSEAD and WIPO, 2013).

Innovation System Approach

Defined as interactive innovation models, these approaches handle innovation within the framework of a "system approach", and considers innovation as a cyclical process that may occur in any type of economic activity area (interactive model), based on collaboration and partnerships among producers, users (customers), suppliers, research institutions, and organizations and actors other than the company itself (Yavan, 2018).

Interactive Innovation (Innovation System) Model conceptualizes innovation as a process that is generally based on trial and error, combining already available applications, along with new combinations, and in this way occurring not radially as in the linear model, but in stages and increments through small improvements. In that regard, the influence of evolutionary economy theory on the origin of system theories is quite clear. This innovation model accepts that innovation is a social, corporate and evolutionary process that is based on space.

Innovation in this model appears with tacit knowledge within informal


ASO 1 OIZ

networks and relationships based on face-to-face contact and trust, within a particular geographic proximity by means of doing, using, learning, and interacting with others (Yavan, 2018). In the beginning, this approach was developed within the framework of national innovation system theory, and later on redefined at a regional level with the influence of internal growth theorists.

National Innovation System (NIS)

According to the Innovation System approach, innovation can be analyzed on national, regional, and sectoral scales. In that regard, looking at innovation through the lens of the system approach, started with the "National Innovation System" concept that was coined in the 1990s (Yavan, 2018).

A national innovation system is comprised of various different actors such as public institutions, private sector organizations, universities, research institutions, and other interfaces, as well as institutional organizations that influence these actors' behaviors, define their framework, and regulate rules. Therefore, the innovation system creates a complex network of mutual relationships, flows, and interactions between actors and the structure. This way, the innovation system at a national level can be seen as a whole where different actors each play a fundamental role.

Regional Innovation System (RIS)

Regionalization is seen as one of the important factors of globalization; and it refers to the concentration of economic activities dependent on location-specific resources (Storper, 1997). This situation highlights the regional innovation system, as well as the support mechanisms that are the primary elements among those that generate this system especially in developing countries. In fact, the innovation system approach was initially handled and defined on "a national scale".

The "Regional Innovation System" (RIS) is a relatively new conceptualization. When interactive innovation models defined the nature of innovation as a process that is embedded in space, and one that occurs through local social interaction, collaboration, and networks, they started a wave of interest towards globally successful innovative regions and spaces, which led to those regions being subject to several research studies from the RIS perspective.

The leading spatial aggregations as mentioned are the Silicon Valley and the Route 128 Corridor in the United States, Baden-Württemberg region in Germany, the M4 Corridor and the Cambridge Innovation Zones in England. Today, both academic publications, and international organizations, especially the EU and the OECD, as well as national-level institutions of many countries define innovation at a regional/provincial level, and predicate innovation on regional innovation indexes and performances. Therefore, cities and regions have significant importance in understanding innovation dynamics, defining innovation processes, and establishing policies accordingly (Yavan, 2018).

The "Regional Innovation System" approach that emerged in this context has become a pioneering approach that is used to describe the innovation processes of domestic and regional-level companies and industries especially in the European Union and almost all over the world since the beginning of the 2000s (Yavan, 2008).

Being one of the most crucial innovation approaches that is used as a basis for regional development and gaining competitive power, RIS emphasizes that an innovation system must be tackled either on a "domestic" and/or "regional" level, based on the fact that innovation is concentrated in a particular geography, and that innovative activities occur essentially on "regional-scale". The RIS approach is identified as a system that basically takes shape through network structure connections that originates from regional interaction and collaboration of local actors and includes on one hand the production and creation of information, and on the other, its use and dispersion (Yavan, 2018).

The RIS is comprised of various different actors, similar to the national innovation system. These actors are comprised of innovation interfaces, such as research institutions, companies and technoparks, TTOs, clusters, support providers, consultants, industry and commercial chambers, entrepreneurship and technology centers. The RIS is an environment that works with a network structure system that is made up of relationships, interactions and collaborations that occur among the various actors and structures that it constitutes of. The effectiveness of a RIS is dependent on the quality and intensity of relationships among these actors. The conception of RIS focuses on how universities, research institutions and companies develop collaborations together, rather than how they individually behave. In summary, the concept of RIS is based on the idea that companies rarely act on their own in the process of innovation, and that innovation is actually a complex structure that comes to forefront through collaboration (Yavan, 2018).

Typical examples of innovation strategies put forth by local and regional innovation systems have been the "clusters". Attempts to create "innovation clusters" or "technology zones/spaces" at the local and regional level are the most basic priority and success of innovation policy which is based on the non-linear, interactive RIS model, whose framework is given above. On the other hand, undoubtedly not all

innovation clusters or technology zone initiatives succeeded, and because of that, efforts were made to sensitize regional innovation policies to local conditions in a reformist fashion by grounding them mostly on successful cases (Yavan, 2018).

Consequently RIS is an approach where it is acknowledged that there is an interactive learning experience among actors, and innovation is a whole that emerges as a result of a social and spatial process (cultural norms, habits, routines, social rules, historical accidents, etc.) of these mutual learning and interaction processes, as well as various other factors. An RIS unfolds as part of a larger network structure after being embraced by national innovation systems and/or the entrepreneurship ecosystem. When international innovation systems are added to the mix, the integration becomes complete, and the regional innovation system starts operating effectively (Yavan, 2018).

In order to truly achieve progress in the RIS, it is necessary to discover, identify, and measure critical factors. These factors include various parameters like the idiosyncratic strengths and weaknesses of local industries and information institutions, as well as the ability to switch from ideas to marketable innovations, access to national and international markets, and financing. Three basic problems that "negatively impact" the effective operation of regional innovation systems (Yavan, 2018) also reveal the basic strategic intervention areas:

- **Organizational Weakness-Correcting organizations' deficiencies:** Absence of necessary actors (such as lack of research institutions, non-existence of innovation tool/interface institutions) for the effective operation of regional system

- **Unable to break the shell-Adapting to the new conditions of competition:** The industrial organizations in the region have been producing with the same technology for the same markets for years, and do not have the ability to set long-term strategic goals for restructuring

- **Weak relationships among actors of the system-Developing relationships among actors:** Lack of communication, coordination and collaboration among organizations in the region, the absence of trust and a common vision among the actors in the region.

Another sub heading that can be considered under the general title of regional innovation system is the regional technology transfer (RTT) models. Looking at the RTT models, it is stated that three different technology transfer services and coordination models are provided. These three models are separated from one another in five distinct dimensions. The main incentives of this model include the basic financing resource, dominant competencies, coordination level, and degree of specialization (Cooke, 1992).

Konya OIZ

Model 1-Base Approach:

In this model, the need for technology transfer arises geographically and historically in an unequal fashion at the local level. In this approach, a research institution may become aware that certain competencies it has are valuable for the local industry; or a local government may sense the technology transfer need of the businesses within its region; or a business discovers a market that is related to a technology it possesses and tries to sell this technology. In this model, the functions of the technology transfer center are limited to product applications, analysis, tests, and the immediate market research. Since the supply and demand for technology transfer comes from the base, there is no need for a complex coordination function. The Japanese Kohsetsuhi system is a technology transfer mechanism that is based on the base approach.

Model 2-Network Approach:

This approach, while it contains most elements of the base approach, also includes systemic interventions, such as taking initiatives as an RTT model, creating policy framework, and establishing regional and national level financing systems. The network approach requires, albeit minimal, a top to bottom strategic guidance and orientation. Generally, the financing of these structures is conducted through mechanisms developed within the framework of national research and development policies, however, a general intervention is limited in its size. In the RTT models organized around a network model approach, centers possess a structure that facilitates regional specialization thanks to the local information that they manage due to their function as a coordination service among different institutions. In this system, conflicts of operating areas of institutions that take on various functions are rare. Germany's RTT strategy, and especially the privatized Fraunhofer Institute operating in Baden-Württemberg can be shown as an example for the network approach.

Model 3-Government Intervention (Dirigiste) Approach:

Being on the opposite end of the base approach, the Dirigiste model foresees a top-down structure in regions that do not have an initiative coming from the local base. The basic financing resources of RTTs,

which are built around or coordinated by a pivotal research center and its labs, are the portions that are allocated by the central government. Regional centers of these types of RTTs have significantly high levels of specialization because of the fact that they are founded and managed by national-scale planning. The regional technology transfer policy by France has been explicitly built around the framework of Dirigiste model. The model has been very successful especially in coordinating the dynamism of the Rhone-Alps regional innovation system.

Among these models, the network approach, which has been implemented by Germany for many years, changed form, and was enabled in different countries as innovation centers with the recent emergence of the urgent need for transformation.

What Does an Innovation Center Do in Terms of OIZs?

There are numerous innovation center-like interfaces around the world. Their structures, areas of focus, objectives, and goals are not the same. They have to have flexible approaches and methods in order to be able to address the changing needs of the industry and the companies (Glennie and Bound, 2016).

The main mission of innovation centers is understanding the commercial needs of companies by being within an accessible distance and supporting them to develop innovative, scalable solutions towards their goals, and accordingly strengthening the relationships between actors. These centers provide access to resources in and beyond the region through a regional, common vision and an integrated attitude, and they create value by means of making connections and creating synergies among institutions and organizations of critical structures and functions for the purpose of entrepreneurship and innovation. In this framework, such structures must have the abilities mentioned below (DEI, 2017).

- The ability to make expert platforms, universities and their research infrastructures accessible to companies,
- Know-how in areas like technique, marketing, management, and communication,
- Ability to access companies who need innovation, as well as to technology-oriented initiatives, to speak their language, and understand their needs,
- Abilities that can analyze current business models and skills, and to help companies in their transitions,
- Ability to work with low-technology companies, as well as all levels of businesses,
- Ability to act as an independent and unbiased mediator among the needs of the sector and the relevant technology suppliers,
- Ability to provide support in accessing financing opportunities (DEI, 2017)

In this framework, the innovation centers that will be built within the OIZs are structures that contain business model expertise, technology and innovation management expertise and relevant services within themselves, and provide information and expertise services that are not currently embodied by reaching out and creating synergies with ecosystem actors that they have immediate and sustainable relations to. In this way, they will offer competitive solutions to the companies and entrepreneurs they provide services to. Capable of interacting with the ecosystem as a whole, such structures take on network providing, facilitating and transforming roles among the innovative class (researchers, R&D staff, engineers, artists and designers, entrepreneurs, industrialists, academics, and government executives) by reinforcing interaction among actors, stakeholder institutions, different sectors and other ecosystems. Therefore, these structures provide access to the infrastructures, facilities, services and expertise of various regional and national stakeholders, and ensure that retail customers have access to the technical services that they need, such as R&D, technology development, establishment, practicing and protection of intellectual property rights, and collaborate (Cansız, Kurnaz and Yavan, 2018).

On the other hand, another important mission of the Innovation Centers in OIZs is to transform the structure of the OIZ to become a more innovative organization. In that regard, it will undertake a role that will facilitate transitioning to a new generation economic zone through an institutional transformation, like providing services in a more innovative fashion, and extending innovation culture to all OIZ areas of responsibility.

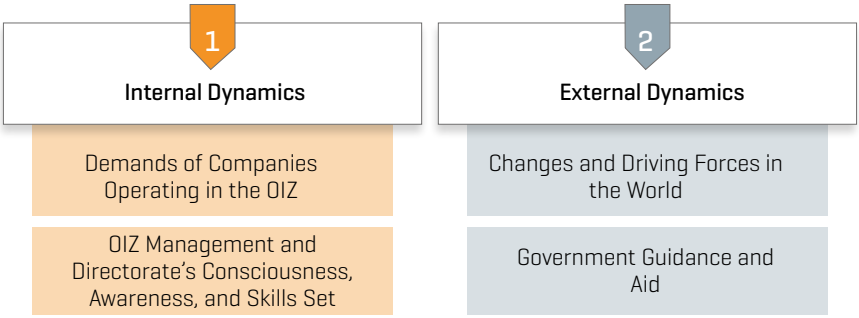
1.3. Transitioning to Industry 4.0 and the Information Economy in Turkey: Transformation of the OIZs

The Transformative Role of Organized Industrial Zones in Transitioning to an Information Society and Beyond: How to Enable the Innovation-Based Transformation of an OIZ?

Can Organized Industrial Zones be transformed into tools that will promote technological and cognitive transformation of their industry? If we believe that an OIZ structure capable of leading an industrial transformation can be formed, it will be appropriate to start by identifying the basic elements of the dynamics that will make this new structure a possibility. Roughly defining the internal and external dynamics that will initiate the movement may boost our eagerness in solving the problem that we are handling, with an effect much like the one created by the habit of organizing the desk before starting to work.

1.3.1. DYNAMICS OF TRANSFORMATION

Figure 4 **Factors That Influence the Transformation of the OIZs**



Internal Dynamics (Within OIZ)

Demands of Companies Operating in the OIZ
Companies may have some R&D, innovation, entrepreneurship, and digitalization demands from the OIZs in order to strengthen their competitive power in the market. However, the fact that there are so few companies with these demands, and that they cannot sufficiently undertake executive functions, results in their inadequacy to have enough influence on the OIZ management. In this regard, exposing such transformation demands coming from the main actors of industrial production is the main topic that an OIZ, which expresses its desire for an innovation-oriented restructuring, should be tackling. It should not be forgotten that every transformation movement will (at least in the beginning) face a significant amount of resistance, and commitment-based alliances must be formed in the largest sense possible when establishing the transformation policy. Therefore, it is important to recruit industrialists and managers within the OIZs who are vocal about their transformation demands, and to ensure their active participation in the designing and the implementation stages of transformation.

OIZ Management and Directorate's Consciousness, Awareness, and Skills Set There are few managements and directorates that have attained success in their routine OIZ operations (municipal works, education and information, as well as some individual-based projects), and are now willing to contribute to the innovation capacities of companies and to the regional economy by doing something new. These OIZ managements and directorates possess the tendency for a capacity to follow developments in the world, have a level of awareness for the importance of innovation, conduct various activities in this regard, and allocate (social, economic, man power) resources to these items. Concrete results that will be obtained by having OIZs that are eager to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transition to a new stage and lead an innovation-oriented transformation will set an example for other OIZs. In this sense, a transformation implementation guidebook may be prepared, and made accessible to OIZs who are aiming to materialize innovation-based transformation projects.

External Dynamics (Outside of OIZ)

Changes and Driving Forces in the World

Companies, institutions, regional innovation systems, and national ecosystems are rapidly changing within the scope of the transition process towards an information and digital society economy, and more active and innovative employees are quicker in their adaptation to this transformation.

This process brings forth the obligation of industrial and technological zones to provide more qualified services to the companies operating within them.

It is apparent that structures that are identified as societies that are beyond-knowledge, and aside from the dissemination of information are able to filter out the relevant information from a global stack of information in line with its stakeholders' goals, are becoming prominent. Establishment of synergies based on collaboration towards collectively identified goals and the constitution of structures that would provide the environment and information needed for these formations are one of the key objectives of the institutions which will manage the transformation.

Government Guidance and Aid

It is the government's manifestation of its will and support that will motivate the OIZs' innovation-based transformation, stimulate institutional transformation, and force these structures to turn this change into an advantage.

The government's argument that long-term approaches are the main architect of technological developments is gaining more and more supporters each day. Achievements acquired by comprehensively funding military technologies is suggested as a reference to this arguments, as they form the basis of several technologies that are widely used in today's world such as computers, the Internet, and smart phones (Mazzucato, 2015, 2016; Sachs et al., 2019). In order to put into global practice the newly designed business models, aside from high technology products for the purpose of commercializing innovations funded by the government, there is a need for the dynamic structure of the private sector. Therefore, it is crucially evident that in order to materialize the innovation-based transformation of OIZs, the private sector will have to carry the matter beyond their daily production processes and embrace further responsibilities, in addition to government aid.

Assessment of Dynamics

The very first step to designing a successful transformation in the OIZs is to comprehend the basic operation mechanisms regarding the internal and external dynamics that were listed above. It is clear that the sense of ownership will be stronger towards strategies that are built on this foundation, which can be understood as the intellectual output of a broad-based field study.

In this framework, the close monitoring of the implementation process of the pilot project, which aims for an innovation-based transformation of the MOIZ that has been designed as an experimental implementation, will enable scientific analysis of proposals regarding the internal and external dynamics.

İzmir Atatürk OIZ

1.3.2 OIZ POLICIES AND TRANSFORMATION

As an important tool for Turkey's industrial policy, and despite being very specific to Turkey, OIZs can be examined within a framework of "exclusive economic zones" in the world. From that perspective, Turkey has different types of exclusive economic zones: (i) Organized Industrial Zones: There are 321 OIZs, 53,500 companies, 2 million employed; (ii) Free Zones: 18 FZs: 2,830 companies, 67,000 employed; (iii) Technology Development Zones: 85 TDZs, 5,400 companies, 52,300 employed.

Looking at the OIZs in more detail; the first OIZ in Turkey was founded in Bursa in the 1960s. The construction, zoning and management process of the OIZ, managed within the regulations, procedures and principles, was made into law in the year 2000 after 40 years of implementation experience.

Following this, numerous new regulations and changes were made both in the law and in regulations. Within this period, OIZs in Turkey have succeeded in resolving problems of industrialization in Turkey; and prospered as an authentic model of public-private and central-local partnership.

It is possible to look at the OIZs in Turkey under four categories. Notwithstanding the relation to the level of development of the city they are in, it is proportionate to the development of the industry, the university, technopark, and research structures, i.e. the capacity of the RIS. In this regard, the OIZs in Turkey can be classified as either "Metropoles" (Ankara, Istanbul, Izmir), "Hinterlands" (such as, Bursa, Kocaeli, Manisa, Tekirdag), or as "New Focuses of Industry" (Gaziantep, Konya, Kayseri, Denizli, Eskisehir, Antalya), plus those that operate in other "Neighboring Cities".

Different categories of OIZs have differences in their quality and variety of services. While test centers, model factories, vocational high schools,

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hotels, and digital services are more common in the OIZs located in the developed regions, underdeveloped regions are only recently resolving their zoning and municipal problems.

The OIZs that are easier to transform into innovative OIZs are in the categories of metropoles, hinterlands, and new focuses of industry, respectively. Pilot projects selected within the scope of the Developing a Model to Improve Technology Use in OIZs are considered accordingly.

Undertaking an important role in Turkish economy's transition to a resource-based economy to one that is based on productivity, OIZs are also expected to assume a significant part in transitioning from a productivity-based structure, to one that is based on innovation (Cansız, Kurnaz, Çağlar, 2019:11).

The 11th Development Plan aims for a 33% increase in the ratio of planned industrial sites in relation to the surface area of Turkey, an improvement in the OIZs' contribution to the competitiveness and productivity of the industry, the inclusion of environmental planning in the setup of OIZs, and a transformation of the existing ones, plus the institution of change based on social reinforcement. Furthermore, the fundamental policies include improving the transformation of OIZs, as well as the companies' innovation capacity by establishing OIZ innovation centers - which is the reference of this study.

Similarly, the Industry and Technology Strategy also mentions the constitution of Innovation Centers in OIZs, especially to develop SMEs.

2 CURRENT STATUS

Manisa OIZ

Assessment of current status is framed upon three basic analyses:

- Firstly, the actors in the Manisa Regional Innovation System were examined.

- Then, the 12-year progress of Manisa companies with more than 10 employees operating in the areas of manufacturing industry and information communication technologies was evaluated using the Entrepreneurship Information System, along with their position and performance compared to the Turkey's average.

- Finally, the data was compiled about the capacity of the Manisa OIZ where the Innovation Center will be established, as well as the services it will provide, and how it will meet the demands of the industrialists operating in the region.

2.1. Manisa Regional Innovation System

According to the 2018 Turkish Statistical Institute (TSI) data, Manisa's population is 1.429.543. It has 17 districts. By 2017, the gross domestic product (GDP) per person in Manisa was USD 9,694. While this income level is below Turkey's average (USD 10,602)[1], Manisa ranks 17th countrywide.

According to the "Socio-Economic Development Ranking of Cities and Regions" research (2017), the city of Manisa ranks 23rd, and is among the second rate developed cities. By taking a look at the lower indexes and variables of the socio-economic development index, Manisa ranks higher in terms of economic activities, employment, competitive and innovative capacity, while in terms of quality of life, health, and education conditions, Manisa seems to be low in the rankings (MoIT, 2019-2).

In 2003, Manisa ranked 25th in the socio-economic development rankings of cities, and 23rd in the year of 2017. Therefore, it is seen that the city of Manisa has not made a relatively significant improvement in terms of socio-economic development in the 2000s, and barely held its place in the rankings (MoIT, 2019-2).

[1] Manisa Investment and Promotion Guide, Zafer DA, 2019

2.1.1. CELAL BAYAR UNIVERSITY (RESEARCH CENTERS, TECHNOPARK, AND TTO)

Founded in 1992, Celal Bayar University produces approximately 10,000 graduates every year. Even though there is no center for excellence at the university, there is a central lab.

Manisa Technocity was founded in late 2013 following the announcement of the technology zone, and started operating in 2018. There are currently 92 companies operating at the Technocity. There is a total of 293 employees there, 206 of which are R&D personnel. According to the 2019 data, the number of projects that were being carried out in the region was 137, while the number of completed projects up to this day is 275. The amount of sales made in 2019 was approximately TRY 94 million, and the amount of exports totaling USD 10 million. The recent Smart Products and Production Systems Research and Education Center Project supported by the Development Agency and the Manisa Defense Industry Technology Development Cluster Project may be considered as important steps towards improving the innovation capacity of the region and the university-industry collaboration. Additionally, through these projects, certain special tests, analyses, technology and product development systems were brought in to the Technocity.

In 2019 a TTO was established in Manisa by the Technocity. Still in its foundational stage, the TTO will need more time to be influential in collaborative efforts between university and the industry. For this reason, a better suited approach would be to structure the Manisa OIZ Innovation Center along with the TTO in an integrated manner, so that the OIZ, and in general the Manisa industry, will be able to cultivate collaborative relationships with cities with developed ecosystems like Ankara, Istanbul, and Izmir in particular. Such an approach may allow the IC to develop a relationship network with regards to commercializing R&D activities of the technopark companies and finding solutions to the technological problems of companies operating in the Manisa OIZ through technological entrepreneurship.

2.1.2. OIZs

There are 321 OIZs in Turkey operating as legal entities, and 261 of these are mixed OIZs, 54 are specialized, and one is a Reformation OIZ. Around 53,500 companies in the OIZs have a total of 2 million employees.

Manisa has 7 OIZs who have completed their registrations. 531 out of a total of 614 industrial lots in these OIZs are allocated; 370 of these allocated lots are in the production phase, 81 are still under construction, and 80 are at the project phase. 83 lots are yet to be allocated. The occupancy rate of the OIZs is 10 percent in specialized OIZs, and 75 in the mixed OIZs.

The abovementioned OIZs have about a 90 percent share in Manisa's production, employment, and export. The Manisa OIZ will be examined in more detail in the following sections.

2.1.3. CLUSTERS

Clustering can be defined as collaborations of companies with other companies and institutions within the value chain. Companies in the cluster may be more productive and innovative, and as a result be more competitive than others. Clusters may provide certain advantages to companies, such as easy access to product, technology and market information, development of joint projects, and development of mutual solutions.

Clustering policies in Turkey are implemented within the framework of priorities of improving competitive power based on internationalization and innovation. The Ministry of Commerce's UR-GE (Endorsement of Development of International Competitiveness) Program targets internationalization, while the Ministry of Industry and Technology (MoIT) has the Cluster Support Program in the name of innovation.

There is no clustering project supported by MoIT in Manisa. The Ministry of Commerce supported the R&D projects of the mould and machinery manufacturers as well as the R&D project for the automotive industry in Manisa.

The fact that most companies function as contract manufacturers* that produce for large companies and generally do not have their own brands and/or cater to the requirements of brands larger than their own, the weakness of companies' innovation capacities, lack of trust between companies and the lack of culture of cooperation are the greatest risk for clusters and these risks can even be greater for the region of Manisa.

Inclusion of potential agglomerations in certain sectors in an effective public policy and an effective motivation through the activities of the Development Agency, technocity, TTO and IC may only be possible with the companies within the sector where agglomerations operate and the relevant sub-sector companies embracing the process, willing to make investments towards improving innovation and competitive power and tending to develop mutual objectives. For instance, the organization of a cluster setup in Manisa in the area of electronics and the role the IC would have in this process can be discussed and planned with the ecosystem institutions and with companies in the relevant sector. This would take the skill set gained through Vestel's influence further, and make new and complementary know-how among companies in the region more widespread.

2.1.4. R&D CENTERS

The number of R&D Centers that began to appear with the enforcement of the Law no. 5746 on Supporting Research, Development, and Design Centers in 2008 has recently soared. In 2008, when the law became effective, the required number of full time R&D personnel in order to establish an R&D center and then benefit from the initiatives was 50; but this number was dropped to 30 in 2014, and finally to 15 in 2016. As a result of relief in this requirement, the number of R&D centers have gradually increased both in Turkey and in Manisa. As of January 2020, Manisa has 32 R&D centers. The basic problems of R&D centers in general, and the ones operating in Manisa in particular, can be summarized as follows:

* Throughout the rest of the study, the word "contract manufacturer" will be used within this framework of reference.

- There is a need for collaboration and improved communication among the R&D Centers themselves, as well as with the other actors in the ecosystem.
- There are imperfections in the areas of participation in national and international project markets, development of joint projects, and pre-competition collaboration.
- There is a need to improve information sharing among centers.
- Shortcomings are especially significant in the area of commercialization.

The needs analysis discusses the roles that can be undertaken by the Manisa OIZ Innovation Center in contributing to the development of R&D centers.

2.2. Company-Level Analysis

One of the important factors in the transformation of a city's manufacturing structure is the changes that their level of technology undergoes throughout the years. Depending on the number of businesses and their turnover, certain sectors stand out in Manisa, and play a crucial role in the economic development/growth of the region.

In that regard, the company-level change in Manisa over a period of 12 years (2006-2017) has been analyzed. In this analysis, the Entrepreneurship Information System has been used, and companies with 10 or more employees operating in the manufacturing industry and information technologies sectors have been selected.

2.2.1. COMPANY, NUMBER OF EMPLOYEES, LEVEL OF TECHNOLOGY, NET SALES AND OPERATION PROFIT

Table 5 shows the breakdown of companies with 10 or more employees operating in Manisa and Turkey based on their levels of technology over a 12 year-period, as well as their number of employees.

Manisa's Position Relative to Turkey;

- The number of companies in Manisa recorded an 86 percent increase, and has risen to 731 from 393. This rate is above Turkey's average (72 percent).
- The total number of employees within these Manisa companies has shown a 28 percent increase and rose from 42,000 to 54,000 employees. This rate is below Turkey's average. While the number of companies recorded an increase above Turkey's average, the relative increase in the number of employees significantly lagged behind.
- While the average number of employees in companies in Turkey has not changed between 2006-2017 (62 people), this number regressed in Manisa from 107 people to 74 (32 percent) during that same period. Some companies shrunk due to an increase in their work force efficiency and technological capacity.
- The increase in the number of enterprises and decrease in the number of employees in Manisa has also impacted its position in Turkey.

While Manisa's share of number of enterprises in Turkey was 1.2 percent

in 2006, this number increased to 1.3 percent in 2017.

The situation was the opposite when it comes to the number of employees. Manisa's share in Turkey was 2.1 percent in 2006, but this number dropped to 1.6 percent in 2017.

Changes in the Level of Technology
The changes in the level of technology that occur in the abovementioned matters give important clues about industry transformation in Manisa.

- Looking at changes in the levels of technology of companies operating in Manisa, there is a significant increase in the medium-high technology sectors.

While there were 73 companies in this sector in 2006, this number saw a 101% increase in 2017 reaching a total of 147 companies.

- Parallel to this increase, the number of employees recorded a 37 percent increase, increasing from 11,803 to 16,119. While there was an increase in the number of companies that is above Turkey's average, the increase in the number of employees lagged behind.

- A substantial level of regression is observed in sectors with high technology with regards to both entrepreneurship and number of employees.

Table 5 **Number of Companies and Employees (2006-2017)**

Period	Level of Technology	MANİSA			TURKEY			MANİSA			
		Number of Enterprises	Number of Employees	Average Number of Employees	Number of Enterprises	Number of Employees	Average Number of Employees	Rate of Enterprises within the City (%)	Rate of Enterprises within Turkey (%)	Employee Rate within the City (%)	Employee Rate within Turkey (%)
2006	Unclear	2	29	15	1.066	70.442	66	0,5	0,2	0,1	0,0
	Low	169	10.869	64	16.125	993.023	62	43,0	1,0	25,7	1,1
	Medium-Low	141	11.149	79	8.535	487.468	57	35,9	1,7	26,4	2,3
	Medium-High	73	11.803	162	5.623	365.569	65	18,6	1,3	28,0	3,2
	High	8	8.365	1.046	376	51.522	137	2,0	2,1	19,8	16,2
	Total	**393**	**42.214**	**107**	**31.725**	**1.968.023**	**62**	**100,0**	**1,2**	**100,0**	**2,1**
2017	Unclear	9	177	20	3.139	156.871	50	1,2	0,3	0,3	0,1
	Low	277	17.201	62	26.183	1.579.596	60	37,9	1,1	32,0	1,1
	Medium-Low	292	19.452	67	15.400	894.082	58	39,9	1,9	36,1	2,2
	Medium-High	147	16.119	110	9.291	660.041	71	20,1	1,6	30,0	2,4
	High	6	865	144	560	84.372	151	0,8	1,1	1,6	1,0
	Total	**731**	**53.815**	**74**	**54.573**	**3.374.963**	**62**	**100,0**	**1,3**	**100,0**	**1,6**
Total 2006-2017 Variation Rate %		86,0	27,5	-31,5	72,0	71,5	-0,1				
Medium-High Technology 2006-2017 Variation Rate %		101,4	36,6	-32,2	65,2	80,6	9,3				
High Technology 2006-2017 Variation Rate %		-25,0	-89,7	-86,2	48,9	63,8	10,0				

Source: EIS, 2019

Parallel to this, Table 6 shows the number of employees in the innovative class, as well as their ratios, including Manisa.

- The ratio of innovative class employees in Turkey was 15 percent in 2014, while this percentage went up to 16.8 in 2017.

- The 2014 ratio of innovative class among all employees in Manisa was 10.8 percent, while this number went up to 15.9 in 2017.

- Similarly, around the same years, Manisa's weight among the innovative class employees in Turkey has made progress, though small, from 1.2 percent to 1.4 percent.

Table 6 Change in the Number of Innovative Class[2] Employees (2014-2017, percentage)

Years	Criteria	Manisa	Turkey
2014	Rate in the City	10,8	15,0
	Rate in Turkey	1,2	100
2015	Rate in the City	9,6	15,0
	Rate in Turkey	1,1	100
2016	Rate in the City	15,9	15,7
	Rate in Turkey	1,7	100,0
2017	Rate in the City	13,4	16,8
	Rate in Turkey	1,4	100

Source: EIS, 2019

Table 7 shows company net sales figures and their breakdown in percentages for the years of 2006 and 2017.

Manisa's Position Relative to Turkey;

- In the period between 2006-2017, Manisa companies have displayed a much higher performance compared to the companies in Turkey (80 percent), with a 183 percent rate of increase in terms of total net sales.

This rate is even higher in the medium-high technology sectors, with a 273 percent increase.

- Net sales per company in this period have increased 53 percent in Manisa, and 5 percent in Turkey. In terms of net sales, the medium-high technology sectors in Manisa have seen an 85 percent increase per company.

[2] **The innovative class definition includes the following profession codes;** 11-Chairmen, senior executives and law makers, 12-Commercial and administrative managers, 13-Production and specialized service managers, 14-Hospitality, retail and other service managers, 21-Professional members in the areas of science and engineering, 22-Healthcare professionals, 23-Professional members of education, 24-Professional members of business and management, 25-Professional members in the areas of information and communication technology, 26-Professional members in the areas of law, social and culture, 31-Members of subsidiary professions regarding science and engineering, 32-Subsidiary healthcare professionals, 33-Members of subsidiary professions regarding business and administration, 34-Members of subsidiary professions regarding law, social, culture, and similar areas, 35-Information and communication technicians.

■ When looking at the operating profit and profitability of companies in the period of 2006-2017, Manisa positively differentiated from Turkey, and achieved significantly higher rates of operating profit and operating profitability.

■ Both operating profit and operating profitability in the medium-high technology sectors in Manisa demonstrated a performance that is significantly higher than Turkey's average. However, both sales and operating profits displayed a striking regression in parallel to the number of companies and employee data at the level of high technology.

Table 7 **Net Sales and Operating Profit[3] (2006-2017)**

Period	Level of Technology	MANİSA				TURKEY				MANİSA		
		Net Sales (million TRY)	Net Sales Per Company (million TRY	Operating Loss or Profit (million TRY)	Operating Profitability (%)	Net Sales (million TRY)	Net Sales Per Company (million TRY	Operating Loss or Profit (million TRY)	Operating Profitability (%)	Net Sales Rate in the City (%)	Net Sales Rate in Turkey (%)	Operating Profit Rate in the City (%)
2006	Low	1.392	8	39	2,8	322.768	20	16.506	5,1	17,1	0,4	5,5
	Medium-Low	1.491	11	118	7,9	286.376	34	23.576	8,2	18,3	0,5	16,5
	Medium-High	2.128	29	192	9,0	219.632	39	15.380	7,0	26,2	1,0	26,9
	High	3.112	389	364	11,7	35.366	94	1.921	5,4	38,3	8,8	51,1
	Total	**8.125**	**21**	**712**	**8,8**	**929.441**	**29**	**69.239**	**7,4**	**100,0**	**0,9**	**100,0**
2017	Low	6.686	24	354	5,3	588.305	22	43.029	7,3	29,1	1,1	15,8
	Medium-Low	8.164	28	895	11,0	528.059	34	51.037	9,7	35,5	1,5	40,0
	Medium-High	7.945	54	974	12,3	410.589	44	38.465	9,4	34,6	1,9	43,5
	High	167	28	17	10,4	46.323	83	6.828	14,7	0,7	0,4	0,8
	Total	**22.977**	**32**	**2.240**	**9,7**	**1.675.453**	**31**	**147.329**	**8,8**	**100,0**	**1,4**	**100,0**
Total 2006-2017 Variation Rate %		182,8	53,1	214,4	11,2	80,3	4,8	112,8	18,0			
Medium-High Technology 2006-2017 Variation Rate %		273,4	85,4	408,6	36,2	86,9	13,1	150,1	33,8			
High Technology 2006-2017 Variation Rate %		-94,6	-92,8	-95,2	-10,9	31,0	-12,1	255,5	171,4			

Source: EIS, 2019

[3] Net sales figures are deflated.

2.2.2. R&D, PATENT, AND INNOVATIVE CLASS

The increase in the numbersof companies involved in R&D and R&D works is an important indicator of development of innovativeness in a city. Data regarding the number of companies involved in R&D works in Manisa, their expenses, and R&D expenses per company are shown in Table 8.

Companies in the Area of R&D

While the number of companies in Manisa with more than 10 employees has increased 85 percent between 2006-2017, the rate of increase in the number of companies with R&D expenses remained the same at 43 percent. The ratio of companies that are engaged in R&D activities among all companies has dropped from 9 percent to 7 within the same period.

R&D Expenses

In the same period, the R&D expenses have increased 46 percent due to an increase in the number of companies, however average R&D expenses per company have only shown a 2 percent increase.

Level of Technology

The rate of companies engaged in R&D activities in the medium-high technology sectors has dropped. On the other hand, R&D expenses increased 140 percent, and the average R&D expense per company increased 92 percent. In the case of high technology sectors, however, the trend is in the total opposite direction. The ratio of companies engaged in R&D activities demonstrated an increase due to a drop in the number of companies, while the total R&D expenses, and R&D expenses per company, again, significantly decreased.

Table 8 Companies That Engage in R&D and Their Expenses [4,5] (2006-2017)

Period	Level of Technology	Tot. Number of Companies	Number of Companies in the R&D Area	Rate of Companies in the R&D Area (%)	R&D Exp. (thousand TRY)	R&D Expenses Per Company (TRY)	Rate of Companies in the R&D Area in the City (%)	Rate of Companies in the R&D Area in Turkey (%)	R&D Expense Rate in the City (%)	R&D Expense Rate in Turkey (%)
2006	Low	169	8	5	1.559	194.921	21,6	1,6	2,5	0,4
	Medium-Low	141	11	8	3.624	329.463	29,7	2,7	5,9	1,6
	Medium-High	73	16	22	22.062	1.378.896	43,2	2,6	35,8	2,1
	High	8	2	25	34.430	17.215.180	5,4	2,0	55,8	7,9
	Total	**391**	**37**	**9**	**61.676**	**1.666.923**	**100,0**	**2,1**	**100,0**	**2,6**
2017	Low	277	9	3	3.191	354.587	16,7	1,5	3,5	0,6
	Medium-Low	292	22	8	32.474	1.476.103	40,7	3,8	36,0	7,0
	Medium-High	147	20	14	52.855	2.642.774	37,0	2,0	58,6	2,9
	High	6	2	33	1.330	665.174	3,7	1,3	1,5	0,2
	Total	**722**	**53**	**7**	**90.226**	**1.702.385**	**100,0**	**1,9**	**100,0**	**1,8**
Total 2006-2017 Variation Rate %		85	43	-22	46	2				
Medium-High Technology 2006-2017 Variation Rate %		101	25	-38	140	92				
High Technology 2006 -2017 Variation Rate %		-25	0	33	-96	-96				

Source: EIS, 2019

The number of patents secured as a result of R&D and innovation works is shown in Table 9. Since 2003, the impact of placing emphasis on R&D policies and grants has become evident, and the number of patents considerably increased. Manisa ranks 6th in Turkey in terms of number of patents.

4 R&D expenses are deflated.

5 R&D expenses do not show the total spending of companies. They show R&D expenses that are placed in the cost item of the balance sheet. There is no possibility of retrieving different data from the EIS. Therefore, the figure obtained is lower than the total R&D expenses made by the private sector in that city. Furthermore, the R&D expenses of the 1-9 company groups are not included in the figures.

Table 9 **Patent Registry Statistics**

Cities	1995-2000	2001-2010	2011-2019	Toplam
İstanbul	65	1.241	7.537	10.149
Ankara	35	253	1.488	2.064
Bursa	11	106	1.185	1.419
İzmir	11	134	643	933
Kocaeli	23	72	654	844
Manisa	**6**	**69**	**395**	**545**
Konya	7	34	408	490
Tekirdağ	2	32	302	370
Sakarya	1	13	249	277
Eskişehir	7	21	179	235
First 10 Cities	168	1.975	13.040	17.326
Other Cities	26	283	1.623	2.241
Total	194	2.258	14.663	19.567

Source: TPE, 2020, https://www.turkpatent.gov.tr/TURKPATENT/statistics

2.2.3. EXPORT [6]

Table 10 shows the export values of companies according to their levels of technology. The ratio of export companies against all companies increased by only 2 percent, and went up to 38 percent in 2017. On the other hand, export amount, export amount per company, and kilogram export value increased. The amount of export per company escalated to USD 5.8 million from USD 4 million in this particular period. The kilogram value of exports scaled up from USD 1.6 to USD 2.6.

On the other hand, looking at the data from a level of technology perspective, substantial increases are observed in the number of exporting companies generally in all sectors other than high technology. The number of exporting companies in the medium-high technology sectors increased by 156 percent, and so the medium-high technology sectors stood out among exporting companies. While the export amount per company increased with the exception of high technology sectors, the kilogram value of the exported product dropped in the high and medium-high technology sectors, remained limited in low technology sectors, and demonstrated an important level of increase in the medium-low technology sectors.

6 Manisa has more exports. Due to the fact that the companies with more than 10 employees were extracted from the EIS, and only the manufacturing industry and information technologies sectors were included, the data here is much lower.

Table 10 Companies Exporting and Export Amounts

Period	Level of Technology	Tot. Number of Companies	Number of Companies Exporting	Rate of Companies Exporting (%)	Exports (million USD)	Exports Per Company (million USD)	Kg Unit Price (USD)	Rate of Companies Exporting in the City (%)	Rate of Companies Exporting in Turkey (%)	Rate of Exports in the City (%)	Rate of Exports in Turkey (%)
2006	Low	169	59	35	234	4,0	1,2	41,5	1,0	41,2	1,8
	Medium-Low	141	44	31	131	3,0	1,1	31,0	1,3	23,1	1,0
	Medium-High	73	34	47	190	5,6	5,2	23,9	1,1	33,5	1,0
	High	8	5	63	13	2,6	14,8	3,5	2,3	2,3	1,4
	Total	**391**	**142**	**36**	**569**	**4,0**	**1,6**	**100,0**	**1,1**	**100,0**	**1,2**
2017	Low	277	96	35	413	4,3	1,4	34,8	1,2	26,0	1,7
	Medium-Low	292	89	30	467	5,2	3,3	32,2	1,6	29,4	1,9
	Medium-High	147	87	59	704	8,1	3,9	31,5	1,7	44,3	1,9
	High	6	4	67	5	1,3	2,0	1,4	1,2	0,3	0,2
	Total	**722**	**276**	**38**	**1.589**	**5,8**	**2,6**	**100,0**	**1,4**	**100,0**	**1,8**
Total 2006-2017 Variation Rate %		85	94	5	179	44	62				
Medium-High Technology 2006-2017 Variation Rate %		101	156	27	270	45	-25				
High Technology 2006 -2017 Variation Rate %		-25	-20	7	-60	-51	-87				

Source: EIS, 2019

2.2.4. RAPIDLY GROWING COMPANIES

Rapidly growing companies and those with potential are the driving forces of both the city's and the country's economy. These are the companies in the world that provide employment and bring out the most innovation. Table 11 and Table 12 show the number and ratios of companies that are rapidly growing[7] and those that have the potential[8] to rapidly grow in terms of net sales and employment in Manisa and Turkey.

Accordingly, Manisa's share in Turkey is somewhere between 1 to 1.5 percent in terms of companies who are rapidly growing and those that

[7] Companies that grew at least 20 percent for three years in a row and have at least 10 employees at the time when they were initially being monitored.

[8] Companies that grew at least 10 percent for three years in a row and have at least 10 employees at the time when they were initially being monitored.

have the potential to rapidly grow within a 12-year period. Looking at the ratio of these companies against companies in total, its share is close to the Turkey's average of rapidly growing companies, while in terms of those that have the potential to rapidly grow, its share is slightly higher than Turkey's average.

According to Table 11, the number of rapidly growing companies in Turkey in terms of net sales was 4,581 (19.9 percent) in the period of 2006-2009, while this number saw an important increase in the period of 2014-2017 and rose up to 7,484 (23.1 percent).

The ratio of rapidly growing companies of Manisa in Turkey between the years 2006-2009 was 1.1 percent, while this share was 19.4 percent within the city. Between the years 2014-2017, these ratios were 1.4 percent and 24.1 percent, respectively.

Table 11 **Rapidly Growing Companies Based on Net Sales Figures**

Years	Cities	Growth Based on Net Sales						
		Rapidly Growing Companies (Hound)	Share within TR (%)	Share within the City (%)	Companies With Rapid Growth Potential	Share within TR (%)	Share within the City (%)	TOTAL
2014-2017	Manisa	104	1,4	24,1	97	1,5	22,5	432
	Turkey	7.484	100,0	23,1	6.338	100,0	19,5	32.456
2013-2016	Manisa	73	1,5	17,9	72	1,5	17,7	407
	Turkey	4.920	100,0	16,5	4.674	100,0	15,7	29.730
2012-2015	Manisa	70	1,4	18,7	80	1,7	21,3	375
	Turkey	4.955	100,0	17,5	4.803	100,0	17,0	28.289
2011-2014	Manisa	72	1,2	20,6	61	1,2	17,4	350
	Turkey	6.153	100,0	22,4	5.175	100,0	18,8	27.517
2010-2013	Manisa	73	1,1	23,4	76	1,4	24,4	312
	Turkey	6.591	100,0	24,4	5.370	100,0	19,9	27.011
2009-2012	Manisa	110	1,2	36,7	71	1,2	23,7	300
	Turkey	9.292	100,0	33,9	5.818	100,0	21,2	27.421
2008-2011	Manisa	89	1,2	28,5	61	1,2	19,6	312
	Turkey	7.180	100,0	26,0	5.179	100,0	18,7	27.646
2007-2010	Manisa	66	1,3	22,6	38	0,9	13,0	292
	Turkey	5.197	100,0	20,5	4.047	100,0	16,0	25.372
2006-2009	Manisa	54	1,1	19,4	44	1,3	15,8	278
	Turkey	4.581	100,0	19,9	3.261	100,0	14,2	23.027

Source: EIS, 2019

In this regard, the share of rapidly growing companies over the span of 12 years in Manisa has increased both in the city, and within Turkey. This also applies to companies with rapid growth potential.

Table 12 Rapidly Growing Companies Based on Number of Employees

Years	Cities	Growth Based on Net Sales						
		Rapidly Growing Companies (Ant)	Share within TR (%)	Share within the City (%)	Companies With Rapid Growth Potential	Share within TR (%)	Share within the City (%)	TOTAL
2014-2017	Manisa	49	1,8	11,3	80	1,7	18,5	432
	Turkey	2.791	100	8,6	4.788	100	14,8	32.456
2013-2016	Manisa	50	1,8	12,3	72	1,6	17,7	407
	Turkey	2.760	100	9,3	4.470	100	15,0	29.730
2012-2015	Manisa	44	1,4	11,7	85	1,7	22,7	375
	Turkey	3.136	100	11,1	4.919	100	17,4	28.289
2011-2014	Manisa	44	1,3	12,6	56	1,2	16,0	350
	Turkey	3.501	100	12,7	4.625	100	16,8	27.517
2010-2013	Manisa	45	1,1	14,4	61	1,2	19,6	312
	Turkey	4.137	100	15,3	4.995	100	18,5	27.011
2009-2012	Manisa	61	1,2	20,3	68	1,2	22,7	300
	Turkey	4.977	100	18,2	5.530	100	20,2	27.421
2008-2011	Manisa	48	1,3	15,4	48	1,1	15,4	312
	Turkey	3.732	100	13,5	4.429	100	16,0	27.646
2007-2010	Manisa	38	1,2	13,0	44	1,2	15,1	292
	Turkey	3.109	100	12,3	3.756	100	14,8	25.372
2006-2009	Manisa	27	1,1	9,7	36	1,1	12,9	278
	Turkey	2.535	100	11,0	3.134	100	13,6	23.027

Source: EIS, 2019

Table 13 shows the top 10 sectors with rapidly growing companies in Manisa and Turkey. Fabricated metal products, food, machinery and equipment, and electrical equipment sectors stand out among the rapidly growing companies in Manisa. In Turkey, clothing, motor land vehicles, food, and textile are the leading sectors.

Table 13 **Sectors of Rapidly Growing Companies**

MANİSA	TURKEY
The Top 10 Sectors of Rapidly Growing Companies Based on Employment	
25 - Manufacturing of Fabricated Metal Products...	14 - Manufacturing of Clothing Material
10 - Manufacturing of Food Products	29 - Motor Land Vehicles, Trailer...
27 - Manufacturing of Electrical Equipment	10 - Manufacturing of Food Products
28 - Manufacturing of Unclassified Machinery and Equipment	13 - Manufacturing of Textile Products
14 - Manufacturing of Clothing Material	25 - Manufacturing of Fabricated Metal Products...
20 - Manufacturing of Chemicals and Chemical Products	23 - Other Non-Metallic Minerals...
29 - Motor Land Vehicles, Trailer...	22 - Manufacturing of Rubber and Plastic Products
33 - Machinery and Equipment Setup...	28 - Manufacturing of Unclassified Machinery...
22 - Manufacturing of Rubber and Plastic Products	33 - Machinery and Equipment Setup...
23 - Other Non-Metallic Minerals...	27 - Manufacturing of Electrical Equipment
The Top 10 Sectors of Rapidly Growing Companies Based on Net Sales	
25 - Manufacturing of Fabricated Metal Products...	29 - Motor Land Vehicles, Trailer...
10 - Manufacturing of Food Products	10 - Manufacturing of Food Products
28 - Manufacturing of Unclassified Machinery and Equipment	13 - Manufacturing of Textile Products
23 - Other Non-Metallic Minerals...	14 - Manufacturing of Clothing Material
27 - Manufacturing of Electrical Equipment	25 - Manufacturing of Fabricated Metal Products...
17 - Manufacturing of Paper and Paper Products	22 - Manufacturing of Rubber and Plastic Products
29 - Motor Land Vehicles, Trailer...	23 - Other Non-Metallic Minerals...
33 - Machinery and Equipment Setup...	28 - Manufacturing of Unclassified Machinery...
16 - Wood and Wood Products and Cork Products...	33 - Machinery and Equipment Setup...
14 - Manufacturing of Clothing Material	30 - Manufacturing of Other Transportation Vehicles

Source: EIS, 2019


Photo: Shutterstock ID: 1389228454

Sardes Ancient City, Salihli, Manisa

2.2.5. CHANGES IN THE CLUSTERING POTENTIAL IN MANISA

Table 14 and Table 15 show the dominance, size and expertise values in the clustering analysis which was undertaken by taking into consideration net sales and employment data, respectively. In the 12-year period between 2006-2017, it can be seen that the clustering (concentration) potential and capacity of Manisa's manufacturing industry based on levels of technology dropped in high technology sectors (such as 26 - manufacturing of Computers, Electronics and Optics Products), and increased in the medium-high technology sectors (29 - Motor land vehicle, trailer, and semi-trailer manufacturing).


Manisa OIZ, MOSPARK

Table 14 Dominance[9], Size[10] and Expertise[11] Analysis of Manisa Based On Net Sales

Sectors - 2017	Value	Value	Sectors - 2006
DOMINANCE			
10 - Manufacturing of Food Products	22,6	37,0	26 - Manufacturing of Computers, Electronics and Optics Products
25 - Manufacturing of Fabricated Metal Products...	20,9	18,6	27 - Manufacturing of Electrical Equipment
27 - Manufacturing of Electrical Equipment	11,6	13,7	10 - Manufacturing of Food Products
29 - Motor Land Vehicle...	10,3	7,9	25 - Manufacturing of Fabricated Metal Products...
28 - Manufacturing of Unclassified Machinery and Equipment	9,0	4,8	23 - Manufacturing of Other Non-Metallic Minerals
22 - Manufacturing of Rubber and Plastic Products	8,5	4,6	22 - Manufacturing of Rubber and Plastic Products
23 - Manufacturing of Other Non-Metallic Minerals	4,6	4,5	28 - Manufacturing of Unclassified Machinery and Equipment
SIZE			
25 - Manufacturing of Fabricated Metal Products...	4,9	37,8	26 - Manufacturing of Computers, Electronics and Optics Products
18 - Printing and Reproducing Recorded Materials	3,5	7,1	27 - Manufacturing of Electrical Equipment
27 - Manufacturing of Electrical Equipment	3,1	3,5	25 - Manufacturing of Fabricated Metal Products...
28 - Manufacturing of Unclassified Machinery and Equipment	2,6	2,5	10 - Manufacturing of Food Products
10 - Manufacturing of Food Products	2,3	2,4	28 - Manufacturing of Unclassified Machinery and Equipment
22 - Manufacturing of Rubber and Plastic Products	2,2	2,1	22 - Manufacturing of Rubber and Plastic Products
29 - Motor Land Vehicle	1,6	1,8	23 - Manufacturing of Other Non-Metallic Minerals
EXPERTISE			
25 - Manufacturing of Fabricated Metal Products...	3,4	17,6	26 - Manufacturing of Computers, Electronics and Optics Products
18 - Printing and Reproducing Recorded Materials	2,4	3,3	27 - Manufacturing of Electrical Equipment
27 - Manufacturing of Electrical Equipment	2,1	1,6	25 - Manufacturing of Fabricated Metal Products...
28 - Manufacturing of Unclassified Machinery and Equipment	1,8	1,2	10 - Manufacturing of Food Products
10 - Manufacturing of Food Products	1,6	1,1	28 - Manufacturing of Unclassified Machinery and Equipment
22 - Manufacturing of Rubber and Plastic Products	1,5	1,0	22 - Manufacturing of Rubber and Plastic Products
29 - Motor Land Vehicle	1,1	0,9	23 - Manufacturing of Other Non-Metallic Minerals

9 It shows the ratio of total turnover/number of employees of the sector in the city relative to the other sectors in the city.

10 It shows how much of the Turkey's total turnover/number of employees in the sector is in that city.

11 It is the coefficient calculated as the ratio of the share of the sector in the city (dominance) to the share of that sector in Turkey (size). The fact that this coefficient is larger than 1 for a given sector shows that this sector stands out in the city.

Table 15 Dominance, Size and Expertise Analysis of Manisa Based On Employment

Sectors - 2017	Value	Value	Sectors - 2006
DOMINANCE			
10 - Manufacturing of Food Products	21,1	18,1	26 - Manufacturing of Computers, Electronics and Optics Products
25 - Manufacturing of Fabricated Metal Products...	16,5	17,1	10 - Manufacturing of Food Products
28 - Manufacturing of Unclassified Machinery and Equipment	10,9	14,4	27 - Manufacturing of Electrical Equipment
22 - Manufacturing of Rubber and Plastic Products	9,1	10,8	23 - Manufacturing of Other Non-Metallic Minerals
23 - Manufacturing of Other Non-Metallic Minerals	8,9	10,0	25 - Manufacturing of Fabricated Metal Products...
27 - Manufacturing of Electrical Equipment	7,8	6,3	28 - Manufacturing of Unclassified Machinery and Equipment
29 - Motor Land Vehicle...	7,3	5,2	22 - Manufacturing of Rubber and Plastic Products
SIZE			
18 - Printing and Reproducing Recorded Materials	3,2	32,3	26 - Manufacturing of Computers, Electronics and Optics Products
25 - Manufacturing of Fabricated Metal Products...	3,1	7,4	27 - Manufacturing of Electrical Equipment
28 - Manufacturing of Unclassified Machinery and Equipment	2,9	3,3	10 - Manufacturing of Food Products
27 - Manufacturing of Electrical Equipment	2,8	3,3	23 - Manufacturing of Other Non-Metallic Minerals
10 - Manufacturing of Food Products	2,7	2,8	25 - Manufacturing of Fabricated Metal Products...
22 - Manufacturing of Rubber and Plastic Products	2,5	2,8	11 - Manufacturing of Beverages
29 - Motor Land Vehicle...	2,4	2,5	28 - Manufacturing of Unclassified Machinery and Equipment
EXPERTISE			
18 - Printing and Reproducing Recorded Materials	2,0	15,5	26 - Manufacturing of Computers, Electronics and Optics Products
25 - Manufacturing of Fabricated Metal Products...	1,9	3,6	27 - Manufacturing of Electrical Equipment
28 - Manufacturing of Unclassified Machinery and Equipment	1,8	1,6	10 - Manufacturing of Food Products
27 - Manufacturing of Electrical Equipment	1,7	1,6	23 - Manufacturing of Other Non-Metallic Minerals
10 - Manufacturing of Food Products	1,7	1,4	25 - Manufacturing of Fabricated Metal Products...
22 - Manufacturing of Rubber and Plastic Products	1,5	1,3	11 - Manufacturing of Beverages
29 - Motor Land Vehicle...	1,5	1,2	28 - Manufacturing of Unclassified Machinery and Equipment

Source: EIS, 2019

2.3. Manisa OIZ

2.3.1. OCCUPANCY AND SECTORAL BREAKDOWN

OIZ Occupancy Status

Occupancy rates of the Manisa OIZ between 2010-2019 are shown in Table 16. According to this, the occupancy rates were 81 percent in 2010 and soared up to 99 percent in 2019. As of 2019, it is recorded that there is production on 196 lots, while 10 lots are under construction, and 1 lot is still at the project phase; the industry facilities in 13 lots are closed.

Table 16 Number of Lots, Operation Status of Facilities and Occupancy Rate of Lots in the Manisa OIZ

Criteria	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Active Facility	145	158	170	180	184	180	186	194	198	196
Construction	29	19	13	11	10	12	14	14	11	10
Project	4	15	17	11	13	10	7	12	0	1
Closed	8	11	10	10	9	18	19	10	11	13
Total Number of Allocated Lots	186	203	210	212	216	220	226	230	220	220
Total Number of Non-Allocated Lots	42	26	18	13	12	9	9	3	5	2
Total Number of Lots	231	230	228	225	228	229	235	233	225	222
Allocated Occupancy (%)	81	88	92	94	95	96	96	99	98	99

Source: Manisa OIZ, 2019

Sectoral Breakdown

Table 13 shows the data compiled regarding the sectors of companies operating in the Manisa OIZ between the years of 2012-2019. Manufacturing of fabricated metal products constitutes 26.2 percent of the companies in the Manisa OIZ with 51 companies. This sector is followed by the manufacturing of rubber and plastic products with 15.9 percent. The ratio of the companies that engage in business in the top 7 sectors with the largest shares is approximately 80 percent of the OIZ. In light of this data, it is evident that the Manisa OIZ has been in a considerable transformation for the last 8 years. While there is a 50 percent increase in the fabricated metal and rubber-plastic sectors, the number of companies in the motor vehicle sectors have dropped around 50 percent.

Table 17 Sectoral Breakdown of the Manisa OIZ Companies

Sub-Sectors in the Manufacturing Industry	2012	2013	2014	2015	2016	2017	2018	2019	Share within the OIZ (%, 2019)
Manufacturing of Fabricated Metal Products	33	36	51	44	44	45	54	51	26,2
Manufacturing of Rubber and Plastic Products	22	20	22	24	24	25	28	31	15,9
Manufacturing of Electrical Equipment	22	25	20	23	23	23	23	25	12,8
Unclassified Machinery and Equipment	18	15	16	16	17	19	22	21	10,8
Motor Land Vehicle, Trailer...	18	21	14	16	16	16	14	13	6,7
Other Non-Metallic Mineral Products	11	12	12	11	11	12	11	13	6,7
Base Metal Industry	8	12	11	14	14	13	9	10	5,1
Manufacturing of Food Products	5	4	4	4	4	5	5	6	3,1
Printing Recorded Media	4	5	3	3	3	3	5	5	2,6
Chemicals and Chemical Products	5	6	4	4	4	4	4	4	2,1
Manufacturing of Paper and Paper Products	4	4	6	5	6	6	3	3	1,5
Manufacturing of Textile Products	3	4	5	5	6	6	5	3	1,5
Manufacturing of Other Transportation Vehicles	2	2	3	3	2	2	2	3	1,5
Other Manufacturing	2	3	2	2	2	2	2	2	1,0
Computers, Electronics and Optics	5	4	3	2	2	2	3	2	1,0
Wood and Wood Products	6	6	6	6	3	3	3	2	1,0
Manufacturing of Tobacco Products	1	1	1	1	1	1	1	1	0,5
Unknown	1	0	0	0	0	0	0	1	0,5
Total	**170**	**180**	**183**	**183**	**182**	**187**	**194**	**196**	**100**

Source: Manisa OIZ, 2018

Table 18 shows the number of companies in the Manisa OIZ over the years based on the company statistics of Turkey's top 500 and second 500 annually published by the Istanbul Chamber of Industry (ICI). Analyzing the data, no significant change is observed over the years.

Table 18 Number of the Manisa OIZ Companies In the ICI Rankings

Years	Top 500	Second 500	Total
2010	20	12	32
2011	20	10	30
2012	19	10	29
2013	21	9	30
2014	19	12	31
2015	22	8	30
2016	18	12	30
2017	17	14	31
2018	20	13	33

Source: Manisa OIZ, 2018

2.3.2. FOREIGN TRADE AND EMPLOYMENT

Foreign Trade

The city of Manisa ranks number 8 in Turkey's exports. Almost all foreign trade activities in Manisa (99 percent) are performed by the Manisa OIZ companies. Table 19 shows the 2010-2019 foreign trade sums. Accordingly, the Manisa OIZ companies have been having foreign trade surplus since 2016.

Manisa's foreign trade data shows that the rate of exports meeting imports is not stable. Traditionally in Turkey, exports are majorly based on manufacturing industry goods, and imports are essentially of intermediate good and raw material nature. Considering the fact that Manisa's exports are also majorly based on the manufacturing industry, it becomes clear that this instability in foreign trade originates from the manufacturing industry products being exported. This instability can only be resolved through shifting production to sectors of high technology and R&D and designing authentic brands and products rather than contract manufacturing, in short, through establishing an innovative culture in the region.

Table 19 Manisa OIZ Foreign Trade Data

Foreign Trade	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Imports (million $)	3.565	4.300	4.150	4.100	4.600	3.725	2.830	4.070	3.600	2.800
Exports (million $)	3.085	3.520	3.250	3.300	3.500	3.465	4.300	4.335	4.445	4.400
Total Volume of Foreign Trade (million $)	6.650	7.820	7.400	7.400	8.100	7.190	7.130	8.405	8.045	7.200
Percentage of Exports Meeting Imports	86,5	81,9	78,3	80,5	76,1	93,0	151,9	106,5	123,5	157,1

Source: Manisa OIZ

Employment

The employment rate in Manisa is around 52.7 percent, while unemployment rate is around 5 percent. Employment has continuously increased since 2010 and reached up to 53,500 by demonstrating an 82 percent increase in 2019.

What is more important is that the rate of white-collar employees has also increased in the same years. While white-collar employment increases slower than the total of employment, it recorded a 67 percent increase, and reached 8,367 from 5,006 people.

Between 2014-2019, the ratio of female employees increased from 23 to 25 percent in the total employment; a ratio which is above Turkey's average. The ratio of engineers in the total employment is 6 percent in 2019. In that regard, development of policies towards attracting engineers to Manisa is considered to be needed in order to maintain Manisa's growth, to increase its R&D activities, and to further improve the medium-high technology sector that is among the advantages of the city. The planned establishment of the Innovation Center is an important tool for such a policy.

Table 20 Manisa OIZ Employment Data

Employment	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Total Employment	29.350	34.600	37.500	41.000	45.500	45.700	46.700	50.000	51.000	53.500
Employment of Women (Except for Subcontractors)					10.537	11.278	11.288	12.154	12.833	13.307
Employment of Men (Except for Subcontractors)					31.242	31.818	31.855	34.747	33.656	36.581
Total White-Collar		5.006	5.658	5.686	6.513	6.802	7.105	7.767	7.707	8.367
Engineers							2.830	3.056	3.019	3.349
White-Collar Men					4.641	4.862	4.996	5.410	5.349	5.758
White-Collar Women					1.872	1.940	2.109	2.357	2.358	2.609
Total Blue-Collar		26.269	30.030	30.000	35.266	36.294	36.038	39.134	38.782	41.521
Blue-Collar Men					26.601	26.956	26.859	29.337	28.307	30.823
Blue-Collar Women					8.665	9.338	9.179	9.797	10475	10.698
Subcontractors		3.185	1.969	1.978	2.076	2.506	2.473	2.525	2.255	3.151
Ratio of White-Collar Workers (%)		14,5	15,1	13,9	14,3	14,9	15,2	15,5	15,1	15,6
Ratio of Women/Men Employees (%)					34	35	35	35	38	36

Source: Manisa OIZ

2.3.3. CAPACITY, SERVICES, AND NEEDS

Innovative Class

The opinions of 30 people working at the R&D centers of companies operating in the Manisa OIZ, regarding the OIZ's personal contributions to them, are shown in Table 21. By analyzing the opinions regarding the OIZ's contributions to the level of tolerance, capacity of innovativeness and entrepreneurship, professional skillsets, and development of social and cultural activities, the opinions converge on the middle value. Therefore, the innovative class working at the Manisa OIZ is generally of the opinion that Manisa OIZ's operations, facilities and the environment it provides neither contributes nor detracts from them personally.

Table 21 **Benefit of the Manisa OIZ to the Innovative Class**

OIZ's Influence on the Innovation-Class R&D Employees	Average Value
The OIZ Increases My Tolerance Level for Other People	3,26
The OIZ Develops My Innovation Capacity	3,23
The OIZ Develops My Entrepreneurship Capacity	3,16
The OIZ Improves My Professional Skills	3,45
The OIZ Improves My Social and Cultural Activities	3,16

1. I Strongly Disagree **2.** I Disagree
3. I Neither Agree nor Disagree
4. I Agree **5.** I Strongly Agree

Source: Innovative Class Research Data, MoIT, UNDP

Furthermore, some of the conclusions from the "Technology Development Project in the OIZs" regarding the evaluation of OIZs' impact on companies, determination of companies' technological needs, and the research on models through which OIZs' can offer solutions to companies' needs are also shared in this study. This research is conducted in the 12 of the most qualified OIZs in Turkey in terms of "patent, R&D projects and exports" (Cansız, Kurnaz, Çağlar, 2019).

The two most important findings of this study are that the companies operating in the OIZs are generally happy with the services offered by the OIZ; that they prefer OIZs specifically because of factors like high quality infrastructure and foreseeable investment environment.

However, as stated in the study, OIZs are still falling short in terms of their ability to respond to companies' needs regarding innovation (Cansız, Kurnaz, Çağlar, 2019).

The data set used in the "OIZs in Turkey Towards 2023" study are interpreted below specific to the Manisa OIZ (Cansız, Kurnaz, Çağlar, 2019).

Table 22 shows the ratios of exports, white-collar and women employees in the Manisa OIZ. The ratio of engineers and white-collar workers within the total employees are lower than the averages of the 12 OIZs included in the study.

On the other hand, the kilogram sales value of products in the Manisa OIZ and the ratio of exports within the turnover are higher than the average. In that case, an increase in the ratios of white-collar employees and especially engineers in the transformation process of companies will allow them to increase the flow of innovation activities. In that regard, R&D center implementations come to the forefront. Therefore, the issue of what sort of functions the planned Innovation Center can undertake in terms of human capital and R&D Centers becomes more important in the needs analysis and strategy phases.

Table 22 Various Comparative Data of Export and Employment from the Manisa OIZ

	Product KG Sales Value (USD)	Exports/ Turnover Rate	Women Employee Rate	White-Collar Employee Rate	Engineer Rate
Manisa OIZ	**25,0**	**45,6**	**22,5**	**13**	**6,4**
Average of the 12 OIZs	14,9	40,8	16,3	20	6,7

Source: UNDP, 2019

Table 23 depicts the position of the Manisa OIZ according to the criteria that include works and processes, generally based on productivity economy, that are among the basic duties of OIZs and facilitate business making for industrialists.

In terms of infrastructure, licenses, audits, superstructures, and emergency services, the Manisa OIZ provides a high level of service to industrialists. Therefore, it is possible to say that the needs identified by the industrialist match with the and the provided services.

Table 23 Basic Services Provided By the Manisa OIZ

Conventional Services	Efficiency of Services		State of Need	
	Average of the 12 OIZs	Manisa OIZ	Average of the 12 OIZs	Manisa OIZ
Infrastructure (connection, sales, operation)	4,1	4,8	4,8	4,9
One-Stop Office (licenses and permits)	4,0	4,8	4,7	4,9
Auditing	3,8	4,5	4,5	4,5
Superstructure services (energy management, cleaning, weighbridge)	4,1	4,8	4,7	4,8
Emergency services (fire, security)	4,2	4,6	4,8	4,8
Logistics Center	2,7	4,7	4,3	4,6
Average	4,1	4,7	4,7	4,8

Source: UNDP, 2019

On the other hand, looking at the social and cultural facilities of the region, it appears that the facilities offered by the Manisa OIZ are above the general average, and that they almost fulfill the needs. Developed social and cultural resources may create an important opportunity for the development of innovation in the region.

Table 24 Social Services Provided By the Manisa OIZ

Social and Cultural Services	Efficiency of Services		State of Need	
	Average of the 12 OIZs	Manisa OIZ	Average of the 12 OIZs	Manisa OIZ
Social Services (Restaurant, Shopping Mall, Sports)	3,5	4,6	4,2	4,3
Vocational and Technical Training	3,3	4,3	4,5	4,6
Daycare	2,5	4,4	4,0	4,4
Residential Communities in the Region (Housing, Entertainment, Education, Health)	2,7	4,1	3,9	4,2

Source: UNDP, 2019

Looking at the innovation activities, even though the Manisa OIZ's values are above average, it is still not able to fully satisfy the expectations of the industrialists operating in the region. Gaps that require improvement are seen especially in the areas of digitalization, technopark, interactions with mentors, and business network development (networking).

Table 25 Innovative Services Provided By the Manisa OIZ

Innovative Services	Efficiency of Services		State of Need	
	Average of the 12 OIZs	Manisa OIZ	Average of the 12 OIZs	Manisa OIZ
Technology Development Zone	2,4	2,5	4,4	4,6
Promotion of Investment, Recruitment of New Investors	2,6	4,1	4,3	4,4
Networking-Improving Collaborations Between Companies	2,8	3,4	4,3	4,5
Business Incubator, Accelerator-Providing Support To Prospective Companies	2,5	3,5	4,2	4,4
New Market Development, Support for Internationalization	2,7	2,7	4,4	4,2
Industry-University Collaboration, Technology Transfer Office	2,7	2,9	4,5	4,5
Matching With Mentors	2,3	3,1	4,0	4,3
Digitalization I. 4.0 Training, Founding a Model Factory/ Innovation Center	2,4	3,1	4,3	4,7

Source: UNDP, 2019

On the other hand, according to the needs analysis conducted by the TTGV in order to improve the Manisa OIZ, the items which are summarized below, can be a basis for the Manisa OIZ IC. Accordingly, internationalization, benefiting from grants, R&D and innovation activities, as well as human resources come to the forefront.

Table 26 Scoring of Manisa OIZ Technological Development Suggestions

Topics	Impact
Information and Technology	
Access to Up-To-Date Information and Technology	3.84
Development of Information and Technology (R&D Operations)	4.20
Development of Information-Based Collaborations (International and National)	3.63
Human Resources	
Attractive Social Environment	4.00
Offering a Promising Career	4.07
Creation of An Interactive Environment	3.80
Commercialization and Internationalization	
Business Idea/Entrepreneurship	3.60
Internationalization - Establishment of Commercial Intelligence Unit	4.80
Commercial-Based Collaborations	3.27
Financing	
Early Phase Risk Capital Fund Partnership	3.60
Bringing Business Incubator Initiatives and Funds Together	3.60
Providing Grant Programs Opportunities	4.40
MoIT Clustering Support	4.20

Source: TTGV 2019, MOIZ Needs Analysis, 1 - very little impact; 5 - very significant impact

2.4. Manisa and Izmir Regional Ecosystem

It would be beneficial to improve relationships and sharing with neighboring cities in order to effectively improve Manisa's entrepreneurship and innovation ecosystem. In that regard, Izmir holds crucial opportunities for the city of Manisa.

2.4.1. IZMIR'S STRATEGIC IMPORTANCE[12]

Izmir is home to rich natural resources and high-quality living standards. Aside from its position by the sea and wide production opportunities, it also provides a competitive advantage in terms of social resources; Izmir is among the cities in Turkey in which the population embraces a Mediterranean identity. Besides the sea, the nature, and its historical features, Izmir becomes an attractive metropole with its culture and economic opportunities.

As the third largest city in Turkey, Izmir constitutes 6 percent of total employment in the country, and 9.3 percent of the total industrial production. With a foreign trade volume of USD 17.1 billion and more than 4,500 exporter companies, it is a center of commerce. On the other hand, with its population of 4.1 million, 42 percent of which is below the age of 30, Izmir has a young and dynamic work force. Izmir has 10 higher education institutions, nine of which are universities, and one is a vocational high school, and this places it among the three most important education and research centers in Turkey.[13]

Izmir

Photo: Shutterstock ID: 470354582

12 Information shared under this title is retrieved from Izmir Development Agency's website https://www.investinizmir.com/neden-izmir

13 YÖK, 2020. www.yok.gov.tr. Accessed: 23/03/2020

Even though the information and research capacity of the city was not reflected in the number of patents, Izmir has a position in which, aside from its international trade capacity, specialized service sectors in the Aegean region like financing or legal and administrative consultancy are aggregated, varied, and provide services to the other cities in the region. On the other hand, Izmir Adnan Menderes International Airport offers the advantage of an international access point to both Izmir and Manisa.

The 13 OIZs, 4 technology development zones and 2 free zones in Izmir provide a suitable investment environment and infrastructure. Izmir is one of the cities in Turkey that receives the most direct foreign investment with its 2,235 foreign-capital companies and an annual average of 140 new foreign investment projects.

Certain national and international research studies demonstrate findings that are aligned with Izmir's abovementioned characteristics:

- The city with the highest quality of life in Turkey (Mastercard)
- Ranking number one in Turkey in the Social Capital Index (KB and MoIT)
- The second most rapidly growing metropole in the world (Brookings Institution)
- The second most attractive city for investors in Turkey (EY)

The fact that Manisa city center and Izmir city center are 30-minute car ride apart allows these two cities that are separated by administrative borders to build close social and economic relationships with each other.

A significant portion of the white-collar personnel working in Manisa lives in Izmir; and university students go back and forth between the two cities. On the other hand, even though it is still not possible to talk about a full social integration between these two cities, the social and cultural resources of Izmir benefit from by Manisa's population as well. Being a developed city in terms of entrepreneurship and innovation ecosystem compared to Manisa, Izmir is still the commercial hub of the region, and provides the majority of expertise services needed in Manisa. Such factors must be taken into consideration in the needs analysis of the Manisa OIZ Innovation Center.

2.4.2. MANISA-IZMIR TRADING VOLUME

Table 27 shows the data on trade volume between Manisa and Izmir in terms of the major sectors. Looking at Table 27, the trade volume between Manisa and Izmir is around TRY 14 billion according to the 2017 prices. Approximately 53.5 of this volume is comprised of the sales made from Izmir to Manisa, while 46.5 percent is the sales made from Manisa to Izmir.

Around 90 percent of trade between Manisa and Izmir consists of manufacturing industry (42.2 percent), trade (41 percent), and construction (5.9 percent) sectors.

Table 27 **Sectoral Trading Volume Between Manisa and Izmir I (2017)**

Sectors	Manisa Buyer (TRY)	Manisa Seller (TRY)	Total Trade (TRY)	Sales/Tot. (%)
C- Manufacturing	3.288.895.628	2.488.221.763	5.777.117.391	42,2
G- Wholesale and Retail Trade...	2.799.131.870	2.815.180.290	5.614.312.160	41,0
F- Construction	470.771.436	333.995.375	804.766.811	5,9
H- Transportation and Storage	195.403.704	240.549.977	435.953.681	3,2
I- Accommodation and Food Services Activities	106.041.114	62.258.450	168.299.564	1,2
K- Finance and Insurance Activities	96.383.154	33.094.358	129.477.512	0,9
A- Agriculture, Forestry and Fishing	93.782.396	119.959.527	213.741.923	1,6
E- Water Supply, Sewage, Waste Management	61.307.565	74.501.795	135.809.360	1,0
M- Professional, Scientific and Technical Activities	51.118.583	36.847.984	87.966.567	0,6
B- Mining and Quarrying	50.827.362	67.348.036	118.175.398	0,9
Q- Human Health and Social Services Activities	50.000.616	4.236.295	54.236.911	0,4
D- Electricity, Gas, Steam and Air Conditioning....	22.750.661	42.741.360	65.492.021	0,5
N- Administrative and Support Service Activities	13.369.713	19.419.322	32.789.035	0,2
J- Information and Communication	9.658.683	10.973.986	20.632.669	0,2
P- Education	8.889.162	12.769.603	21.658.765	0,2
S- Other Service Activities	8.526.289	2.394.069	10.920.358	0,1
L- Real Estate Activities	5.227.837	4.495.098	9.722.935	0,1
R- Culture, Arts, Entertainment, Recreation, and Sports	3.676.878	658.326	4.335.204	0,0
Grand Total	**7.335.762.651**	**6.369.645.614**	**13.705.408.265**	**100**
Percentage	**53,5**	**46,5**	**100**	**-**

Source: EIS

Table 28 shows the trade volume breakdown between Manisa and Izmir regarding the manufacturing industry sectors. While 56.9 percent of a total of TRY 5.8 billion trade was sold by Izmir, 43.1 percent was sold by Manisa. Generally looking at the details of the trade between Manisa and Izmir, it appears that the sectors where Manisa is the net seller are mostly among the very low and medium-low technology sectors. For instance, having the largest transaction volume among sectors, the food sector has been one of the sectors in which Manisa makes more sales.

Table 28 Sectoral Trading Volume Between Manisa and Izmir II (2017)

Sectors	Manisa Buyer (TRY)
10- Manufacturing of Food Products	719.054.490
25- Manufacturing of Fabricated Metal Products...	516.331.430
28 - Manufacturing of Unclassified Machinery and Equipment	390.034.916
29- Motor Land Vehicle, Trailer, and Semi-Trailer...	287.084.232
27 - Manufacturing of Electrical Equipment	279.146.693
22- Manufacturing of Rubber and Plastic Products	256.538.309
23- Manufacturing of Other Non-Metallic Minerals	242.365.307
18- Printing and Reproducing Recorded Materials	107.511.991
24- Base Metal Industry	94.725.352
17- Manufacturing of Paper and Paper Products	69.748.828
20- Manufacturing of Chemicals and Chemical Products	69.323.457
16- Manufacturing of Wood and Wood Products and Cork Products...	40.166.266
31- Furniture Manufacturing	33.934.234
12- Manufacturing of Tobacco Products	33.837.674
15- Manufacturing of Leather and Related Products	28.916.299
33 - Machinery and Equipment Setup and Repair	24.447.968
13- Manufacturing of Textile Products	21.231.247
14- Manufacturing of Clothing Material	19.211.234
11- Manufacturing of Beverages	16.676.532
30- Manufacturing of Other Transportation Vehicles	15.677.975
26 - Manufacturing of Computers, Electronics and Optics Products	11.475.901
32- Other Manufacturing	7.502.127
21- Basic Pharmaceutics Products and Pharmaceutics-Related...	3.160.933
19- Manufacturing of Coking Coal and Refined Petroleum Products	792.233
Total	**3.288.895.628**
Percentage	**56,9**

Source: EIS

Manisa Seller (TRY)	Total Trade (TRY)	Sales/Total (%)
821.953.676	1.541.008.166	26,7
192.723.561	709.054.991	12,3
155.497.681	545.532.597	9,4
149.858.068	436.942.300	7,6
91.267.561	370.414.254	6,4
140.661.053	397.199.362	6,9
128.208.391	370.573.698	6,4
13.339.412	120.851.403	2,1
145.834.454	240.559.806	4,2
139.089.060	208.837.888	3,6
56.508.239	125.831.696	2,2
29.884.467	70.050.733	1,2
19.052.730	52.986.964	0,9
8.118.843	41.956.517	0,7
22.452.242	51.368.541	0,9
11.108.075	35.556.043	0,6
62.538.680	83.769.927	1,5
101.379.627	120.590.861	2,1
166.706.424	183.382.956	3,2
5.434.065	21.112.040	0,4
11.049.557	22.525.458	0,4
8.747.716	16.249.843	0,3
50.000	3.210.933	0,1
6.758.181	7.550.414	0,1
2.488.221.763	**5.777.117.391**	**100**
43,1	**100**	-

Table 29 Trade Volumes of Cities of Manisa and Izmir (2017)

	MANISA SELLER		MANISA BUYER	
City	Amount (TRY)	Percentage	Amount (TRY)	Percentage
İstanbul	12.980.717.167	31,5	13.116.029.177	31,5
Manisa	10.302.733.931	25,0	10.302.733.931	24,7
İzmir	6.369.656.666	15,5	7.335.762.651	17,6
Denizli	2.488.161.757	6,0	2.394.195.434	5,7
Ankara	1.605.782.659	3,9	1.511.488.013	3,6
Bursa	1.276.383.064	3,1	1.271.824.978	3,1
Kocaeli	622.022.851	1,5	1.105.086.397	2,7
Balıkesir	539.921.752	1,3	503.468.743	1,2
Konya	448.611.862	1,1	475.705.746	1,1
Antalya	387.086.241	0,9	271.978.221	0,7
Sakarya	331.374.226	0,8	264.383.785	0,6
Gaziantep	323.002.121	0,8	228.432.967	0,5
Aydın	320.420.450	0,8	222.011.678	0,5
Eskişehir	283.919.143	0,7	219.116.703	0,5
Adana	262.152.155	0,6	217.649.293	0,5
Kayseri	189.965.055	0,5	214.661.861	0,5
Afyon	177.285.272	0,4	187.437.784	0,4
Muğla	172.073.200	0,4	157.827.523	0,4
Mersin	169.828.047	0,4	143.590.571	0,3
Uşak	152.361.088	0,4	119.884.964	0,3
Other	1.800.171.445	4,4	1.426.376.558	3,4
Total	**41.203.630.152**	**100**	**41.689.646.978**	**100**

	IZMIR SELLER		IZMIR BUYER	
City	Amount (TRY)	Percentage	Amount (TRY)	Percentage
İzmir	135.229.289.328	43,1	135.229.289.328	48,4
İstanbul	88.953.339.747	28,3	82.081.550.092	29,4
Ankara	13.504.341.836	4,3	11.299.816.016	4,0
Manisa	7.335.762.651	2,3	6.373.705.374	2,3
Aydın	6.249.590.536	2,0	6.369.656.666	2,3
Bursa	5.715.364.987	1,8	4.392.497.203	1,6
Denizli	5.047.867.339	1,6	3.444.952.850	1,2
Muğla	4.156.023.747	1,3	3.395.949.696	1,2
Antalya	3.944.741.548	1,3	2.193.687.782	0,8
Gaziantep	3.775.764.412	1,2	2.053.826.745	0,7
Kocaeli	3.726.730.092	1,2	1.848.118.577	0,7
Konya	3.181.492.420	1,0	1.810.115.534	0,6
Hatay	3.156.272.669	1,0	1.759.275.847	0,6
Balıkesir	3.131.055.875	1,0	1.621.809.550	0,6
Adana	2.771.163.470	0,9	1.609.444.464	0,6
Aksaray	1.981.033.353	0,6	1.524.168.751	0,5
Mersin	1.809.237.205	0,6	1.320.820.157	0,5
Kayseri	1.265.343.483	0,4	781.868.275	0,3
Sakarya	1.112.372.740	0,4	701.831.570	0,3
Eskişehir	1.110.571.657	0,4	660.613.472	0,2
Other	16.749.934.246	5,3	8.921.493.296	3,2
Total	**313.907.293.341**	**100**	**279.394.491.245**	**100**

2.5. End-of-Chapter Review

The city of Manisa ranks 23rd in Turkey in terms of socio-economic development. Although ranking high in terms of economic activity, employment, competitive and innovative capacity, Manisa is in a lower position when it comes to quality of life, conditions of health and education services. Additionally, Manisa's ranking has not shown a significant change compared to other cities since 2003.

The progress that the Technopark made and the foundation of the TTO in the recent years demonstrate that there is an increase in activities aiming for university-industry collaboration. However, other than its central lab, the university still lacks an advanced capacity to offer high level services to the industry. On the other hand, the Technopark now has systems of certain exclusive tests, analysis, technology and product development thanks to the guided projects endorsed by the Development Agency, and these projects can be considered significant steps towards improving the university-industry collaboration.

Manisa has 32 R&D centers. All of these are located in the Manisa OIZ. It remains important to increase the collaboration and communication of R&D centers among themselves and with other actors of the innovation ecosystem, as there are significant gaps in information sharing, participation in national and international project markets, joint project development, pre-competitive collaboration and especially in commercialization. On the other hand, the R&D centers in Manisa try to get organized amongst themselves in general terms.

There is no cluster project in Manisa that is supported by the MoIT. However, the Ministry of Commerce has endorsed the Automotive UR-GE Project in Manisa. It is crucial to monitor, in the medium term, that the projects materialized at the Technocity with support from the Development Agency take effect in the private sector in terms of technology, production, and organization among companies-institutions, and transform into a capacity that will support a defense industry and/or electronic cluster.

Setting up the IC as an interface and catalyst for the industrialists and seeking common goals and strategies with the other interface institutions, Technocity, TTO, and the Development Agency as the coordinator institution would be beneficial.

According to the EIS data, in the 12-year period between 2006-2017:

- While the number of companies in Manisa increased above Turkey's average, the increase in the number of employees stayed below Turkey's average.

Manisa OIZ Regional Directorate Administration Building

The fact that some companies shrunk due to an increase in their work force efficiency and technological capacity might be influential here.

- Manisa's net sales and operating profitability have increased above Turkey's average.

- There is a significant increase in the medium-high technology sectors in Manisa. A substantial level of regression is observed in sectors with high technology with regards to both entrepreneurship and the number of employees. While the medium-low technology sectors showed. an increase in the number of companies and employees, it is striking to see that the employee composition has changed against the high-tech sectors, and in favor of medium-high, medium-low and, low tech sectors.

- While the number of companies in Manisa has increased by a considerable amount, the ratio of companies engaged in R&D activities among all companies has dropped, which limited the average R&D expense increase per company.

- The number of companies who are engaged in R&D activities in medium-high technology sectors dropped. While the number of companies doing R&D in the high technology sectors did not change, there is a considerable decline in the R&D expense per company. The breakdown of R&D expenses based on the level of technology is shifting from high tech sectors to medium-high, and medium-low tech sectors.

■ In terms of number of patents, Manisa ranks number 6 in Turkey. However, it is thought that this is because of a few companies getting patents, and not because of patent ownership all across the companies.

■ The ratio of companies exporting among all other companies in Manisa has increased only 2 points to become 38 percent in 2017. Nevertheless, exports, exports per company, and the kilogram value of the exported product have all increased. A general evaluation of the export data shows that in terms of the number of companies, the medium-high technology sectors increased their share in the total exports, their kg value of exports dropped, while in the medium-low technology sectors kilogram value of exports significantly increased.

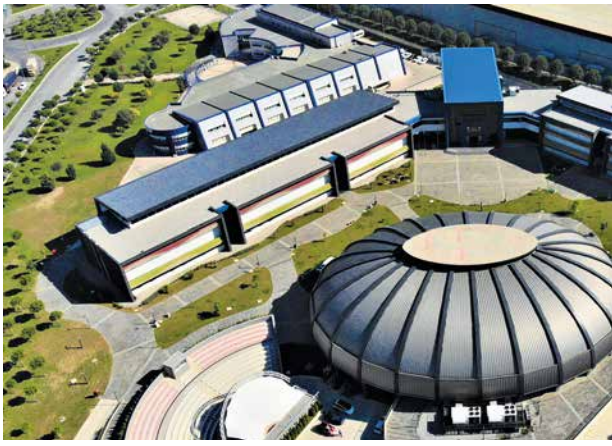
■ The ratio of rapidly growing companies of Manisa in Turkey between the years 2006-2009 was 1.1 percent, while this share was 19.4 percent within the city. Between the years 2014-2017, these ratios were 1.4 percent and 24.1 percent, respectively. Fabricated metal products, food, machinery and equipment, and electrical equipment sectors stand out among the rapidly growing companies in Manisa. In Turkey, clothing, motor land vehicles, food, and textile are the leading sectors. A general overview of the EIS data shows that;

(i) Technologically, Manisa's production has shifted away from high technology sectors, towards medium-high and medium-low technology sectors,

(ii) Companies demonstrate a tendency to shrink in terms of the number of employees,

(iii) In terms of R&D and innovation activities, high technology sectors reduced their R&D activities, companies of medium-high and medium-low technology sectors pursued different strategies such as more intense R&D expenses to gain more competitive power, while others were driven by a more productivity and price-focused competitive strategy without any R&D works.

Along with these findings, it is possible to observe that the industrial organization as well as the repositioning of companies in the value chain provide some clues as below.



MOIZ Occupational and Technical Anatolian High School (MOSTEM)

■ A majority of Manisa companies, especially those in the high and medium-high technology sectors are struggling to achieve development that is in parallel with the technological developments. Even though some companies are spending more on R&D, the fact that the kilogram value of the exported product generally dropped demonstrates that companies started embracing productivity and cost-based competitive strategies in order to adapt to tendencies like: (i) service sector variable having a larger share than the material variable such as software in product cost (smart applications like phone device for cell phone-applications installed in the device, software-based control-cooling for motor vehicles, sound systems), (ii) change in the products happening alongside rapid technological changes and product diversification, as recently observed in some industries like electronics and automotive.

■ In the medium-low technology sectors, some companies saw a significant increase in the kilogram value of the exported product as well as in the R&D expenses of some companies. Others tended towards foreign markets and therefore leaned towards qualified production for foreign market standards or other companies in a way that allows patent and know-how transfer. These trends may be indicators of acquiring added value.

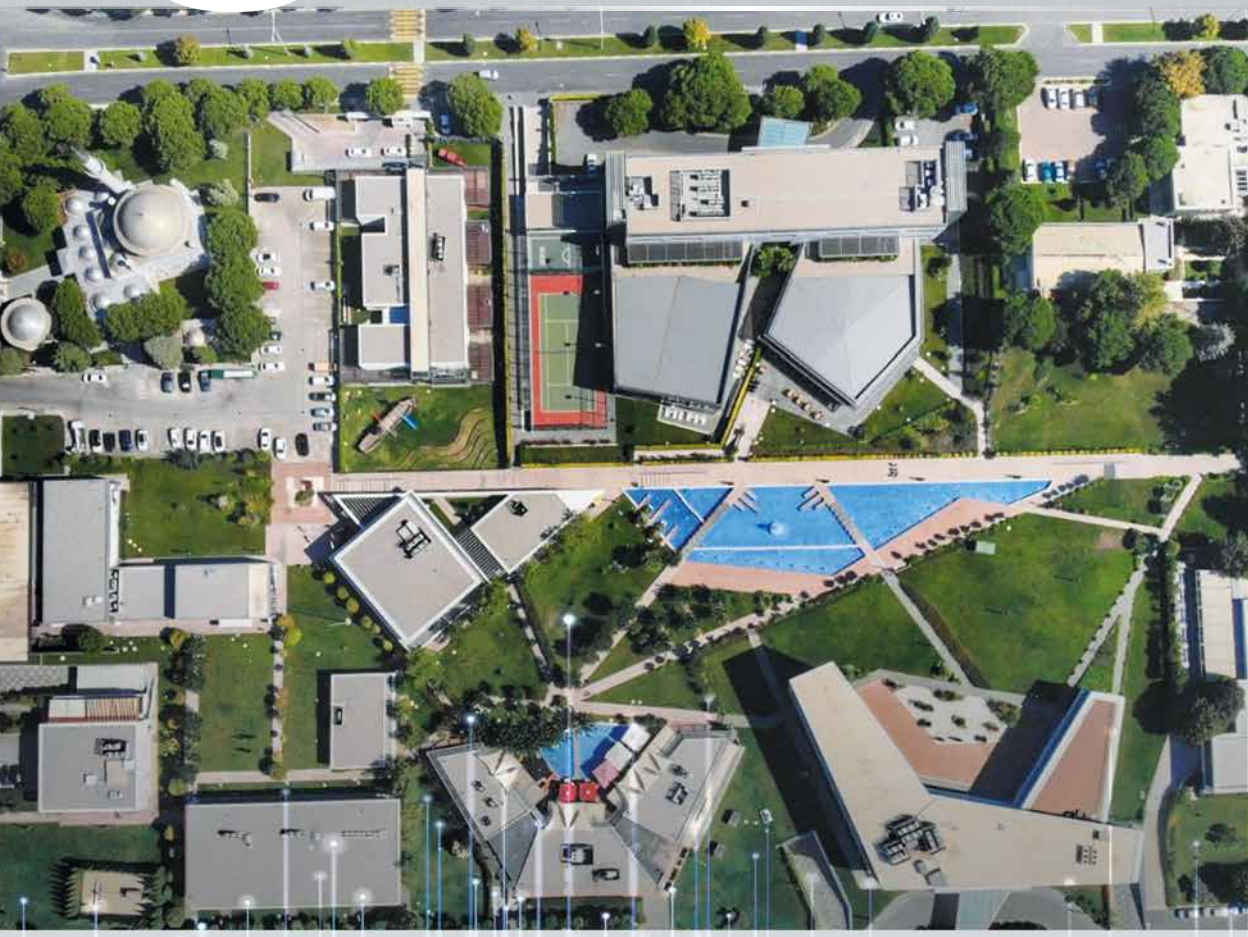
■ Large companies with innovation capacity operating in Manisa may not have sufficiently contributed to the R&D and innovation capacities in other companies.

■ In parallel with these assessments, it appears that Manisa is specialized in relatively lower technology sectors in the Manisa-Izmir trade relations.

On the other hand, Manisa OIZ has won the hearts of industrialists not only with its infrastructure but also with the services it provides, and it is among a few leading OIZs in Turkey in terms of services for the productivity economy. However, the tools and actors of the regional innovation system like TTO, technopark, business incubator, common R&D center, common R&D lab and common test and analysis lab do not exist in the OIZ.

Finally, Izmir will provide important infrastructure and technical capacity opportunities to the IC thanks to future collaborations, and it will constitute a prime market to which the IC can provide services.

3 MOIZ INNOVATION CENTER WORKSHOP



Manisa OIZ
Regional Directorate Campus Site

This section[14] is prepared as a summary of the findings obtained in the February 13-14, 2020 workshop conducted in order to collect opinions of the main stakeholders in the Manisa and Izmir entrepreneurship ecosystem regarding fundamental items in the foundation of Manisa Innovation Center (IC), the pilot implementation of the Manisa OIZ.
The workshop generally sought answers to the questions **"How should the IC be structured? How should its setup and narrative be?"** In this regard, during the pre-workshop preparations, a set of 10 questions were prepared that were thought to be most relevant to the IC and mainly focused on the literature for the purpose of initiating and deepening the topic. The following set of questions prepared as a semi-structured work also constitutes the main titles of this report:

1. What should the IC's functions, duties, and responsibilities be?
2. What should the legal status, stakeholder participation and partnership structure of the IC look like?
3. Should the IC focus on particular areas/sectors? What should they be?
4. How should the relationship between the OIZ and the IC be planned?
5. What should the IC's primary topics be?
6. How should the IC's organization and personnel structure, as well as its personnel qualifications be?
7. How should the IC's financing be organized?
8. How should the relationships/ collaborations of the IC with other institutions be?
9. What should the IC's vision, strategy, and objectives be?
10. What should the IC's communication strategy be?

In addition to these questions, these matters were discussed in depth without any presuppositions or limits. The participants were allowed to share their assessments on new questions and problem areas. The process allowed for consideration of the participants' varying opinions in order to evaluate different dimensions, advantages and disadvantages of issues, rather than generally pursuing consensus.

The study was conducted with a group of 50 people, comprised of industrialists, technology-based entrepreneurs, start-ups, R&D Center executives, OIZ managers, government representatives, and academics. Following a project introduction and a discussion of the general framework, the 50 participants were separated into three sub-groups. These sub-groups tried to discuss and set up the framework of the Manisa OIZ IC by using the set of 10 questions that were readily prepared for the structuring of the IC. The sub-groups were accompanied by two experts who took on the role of the facilitator and the reporter.

In the last session, sub-groups got together again and conveyed their previous discussions and group work findings to the other groups. In the closing session, the workshop was finalized with general evaluations and listening to additional opinions. The following sections summarize the workshop's findings regarding the foundation of the Manisa OIZ IC under the titles listed above.

14 The planning, design and supervision of the workshop and the preparation of the final report (using the subgroup work) were carried out by the author. The workshop subgroups were moderated by Esen Çağlar, Sibel Ersin and Nuri Barış Tartıcı and the discussions were documented.

3.1. Functions, Tasks, and Responsibilities

This title searches for an answer to the question "What should the Innovation Center's functions, duties and responsibilities be?", and functions that the IC can take on or those that may become challenging if it does take them on are discussed.

Innovation Centers do not have standard features, as their structures and functions may change depending on the conditions and characteristics of the regions they are built in. On the other hand, sustainability becomes more of a predominant issue. In that regard, some of the participants verbalized their opinions on such areas from the very beginning.

> *Not all innovation centers are doing the same job. Since it will be specific to here, it will become clearer depending on the factors of this location. We must design something that is financially self-sufficient in order to achieve sustainability.*[15]

Another critical factor was improving the innovative capacity of the OIZ, the companies in the OIZ, and Manisa in general. It was discussed that the IC might undertake various functions in order to make contributions in this regard. The discussions mostly touched upon activities towards enabling the environment that will facilitate the emergence of innovations.

> *The Center must be in the innovative product development process. It should be able to draw technological roadmaps for companies.*

While discussing the functions of the Center, the necessity of establishing collaborations to make the entire research infrastructure of the region available to the industrialists was also mentioned. Some of the participants highlighted that the functions of the innovation center must include focusing on less developed companies in order to expand the innovation culture towards the foundations of the industry.

> *The Center must benefit those who do need this innovation, but who are not yet aware of this need. High class companies have high levels of awareness.*

Those that stand out among these functions can be summarized in the following three groups.

Networking, Matching and Collaborations (OIZTTO)

Following the determination of the problem of the beneficiary company, setting up collaborations with actors (companies, start-ups, experts, mentors, institutions, etc.) that may develop a solution to this problem; and establishing collaborations both with other companies and with other actors within the ecosystem

15 Particular opinions of some of the participants are shared in boxes within the main text.

towards this goal have stood out. One participant explained the function of the IC by using an adaptor analogy:

> *Suppose we all left our chargers at home, and suppose someone comes along with a multiplug adaptor that gives you the opportunity to adjust the amperage, and to use each plug for different purposes. That's what we're looking for. As a representative of the Technopark, I can say that I am ready to offer solutions for the Manisa OIZ's needs, but I have no idea how I can deliver them, how I can offer them at first hand, what are these areas of need, and how often will I offer support. In fact, if we envision such a plain structure, without any overestimations, we can see this as a business based on solely human relations. We may let this place be, and use it as an integrator, moderator, a center for networking.*

It was discussed that the technical knowledge and experience that will be needed may be supplied from the already present regional capacity, and from regional, national and international universities, research centers, and institutions.

Furthermore, the establishment of an innovation radar, and a thorough analysis of the field in terms of who is producing what, and who is better to be interacted with, were underscored.

In this framework, the maintenance of activities like enabling meetings and matchups with relevant actors in the ecosystem (the urban region including both Manisa and Izmir), and in the national and international plane, especially in Ankara and Istanbul was considered as a requirement. This way, it was highlighted that the center would be able to help the industrialist use the knowledge, inventions, skills, technologies, and national and international financing.

> *We do not need very large buildings here, we need networking capacity, because matters we're dealing with are not just about one sector anymore. This has to be about multidisciplinary services that are unknown to the industrialist. I see networking as examples in Izmir, beyond Izmir in Turkey, and beyond Turkey in the international area. I'm sure the industrialist does not have access to these things.*

Education and Consultation Services

The education and consultation needs of companies is another important area that comes up frequently in the interviews. In light of the new information and developments, it is seen to be beneficial to provide consultation and education in a way that will help industrialists understand and diagnose the problems of their company, set up a vision for their company, and establish a competition strategy.

The need for specialized education in the required areas in a way that would encompass more than one company was discussed. Additionally, offering individual consultation services towards specific needs of companies was also highlighted as a probability. To manage such functions, digital transformation, innovation

management, commercialization of R&D, in-house entrepreneurship, and productivity are on the front burner for companies. In this regard, relationships between large and small companies especially might be developed.

While mentioning the IC's role in giving industrialists access to the latest trends and developments, important companies, products and inventions in production, technology and the market, the opportunity to organize joint activities in this direction was also specified.

On this topic, one participant highlighted digitalization and the future perspective of innovations, and talked about what areas education and consultation could expand to.

> *Our industrialists cannot communicate with the university, or find solutions to their own problems, and so they were forced to do their own individual research. Meanwhile, new technologies, new concepts, new missions have emerged. Yes, we will conduct R&D with industry, we will focus on that, but I believe these new technologies can be a shared mission to develop a regional capacity for these concepts. As everybody's talking about the concept of digitalization, I think that as a mission to develop capacity in areas such as new technologies, artificial intelligence, and Industry 4.0.*

The functions of the IC may also include offering technical, financial or legal consultation services that will allow the industrialist to collaborate with companies, mentors and human resources depending on their needs, or establish collaborations with reliable stakeholders who can provide these services.

Open innovation platform

Beyond resolving their innovation-related problems within themselves and gain assistance from the expert pool in the region, the functions of the IC may include participation in open innovation platforms in order for companies to gain access to expert pools in other geographies; as well as the management of activities like capacity building and informing. The coordination role of innovation activities, is also deemed to be important. Avoiding repetition in the activities to be performed by the IC was highlighted by most of the participants.

> *For 10-15 years, we have spent so much money on things like R&D and innovation, we built an interface. We now have Technoparks, TTOs, business incubators. In fact we built a lot of structures, but we couldn't centralize them. Each are in their own hinterland.*

One of the topics that the stakeholders have strongly agreed upon was that the IC, as a long-term investment, will be able to truly show its influence in the period of 2025-2030. Therefore, it was vocalized that it would be more reliable to establish development, investment and financing scenario with a long-term perspective.

3.2. Legal Status; Stakeholder Participation and Partnership Structure

The questions of "How should the legal status and structure of the Innovation Center be [Corp., cooperative, foundation, association, OIZ unit]? What should the stakeholder participation and partnership structure look like?" were discussed as the second matter. Stakeholders have stated their assessments mostly through the legal status identified in the legislation, as well as the advantages and disadvantages that this status brings along.

> *If you are a company, a foundation, or a cooperative in Turkey, you have 3 options in integrated systems.*

While a company structure came to the forefront in terms of the legal status of the IC, the new generation cooperatives were discussed as an alternative worth considering, and the status of a foundation was also mentioned as something to think about.

> *I'm one of those who believe a foundation culture would fit well to this structure. If you look carefully, behind many strong and dynamic structures in the R&D ecosystem, there are foundations like the Turkish Armed Forces Foundation. When the opinion leaders of the region, who are retired, and can be a role model come together, build a board of trustees, and say, "We're starting this foundation, the Innovation Center is our business, because we know how these things are done. And we also have a board of directors. Come join us." I believe we may succeed.*

> *For instance, we are a technology development zone joint-stock company. Even though we do not have any commercial interests, we actually should, as we have commercial concerns. But the foundation has this mentality that does not drive commerce forward.*

Some of the participants seem to pay more regard to the cooperative structure. Global implementation of the changing sense of cooperation as a successful model and the presence of some new generation cooperation success stories in Turkey are all seen as indications that a cooperative structure in the IC application would be successful.

> *Actually, I like the cooperative model. There is this new generation sense of cooperative system, and this is dependent on the living region, it is more of a civil organization. A new generation cooperative system may receive EU funds, include actors in the local ecosystem, and get involved in the development. There are a few examples in Izmir, we have the science cooperative, bio economic cooperative. It is possible to build structures as central cooperatives or a higher unit of cooperatives, that would accommodate the cyclical economic perspectives of today. I believe they should be dispersed, because knowledge is actually buried in the geography. I pay more attention to finding and bringing out that which is buried. Cooperation is an appropriate model for that.*

A concern was voiced about building the IC as an OIZ unit which may lead to inertia, and it was shared by the participants in general.

Some participants suggested establishing the Innovation Center with a non-profit structure that bears fruit for the public interest, and does not distribute profit, but commits a certain share from its pre-tax profit to invest in innovation technologies and innovative entrepreneurs.

Table 30 summarizes the advantages and disadvantages discussed regarding the structures of the said status within the framework of the opinions that stood out in the discussions.

Table 30 Structuring Model and Its Terms

ADVANTAGES	DISADVANTAGES
Joint-Stock Company	
Dynamic, influential, and active Ability to have all employees focus on company objectives Ability to include different stakeholder institutions/industrialists thanks to its partnership structure that can differentiate, and ability to change its partnership structure over time Ability to gain income through its operations	Absence of non-profit company status or the fact that this was never arranged Over time, the risk of focusing the company's main objective on profit making Risk of not being able to benefit from government aid due to being profit-based
New Generation Cooperative	
Enabling local ownership Mobilizing intellectual capital Has the advantage of mobilizing more than one cooperative and structure by benefiting from types such as social cooperative, platform cooperative, and through personal relationships Advantage of benefiting from government aid more easily than a company	Establishment through individual membership Possible challenges in creating financial resources and team building
Foundation	
Being based on a sense of devotion and dedication Establishing a board of trustees with Manisa's prominent names, and the achievement of sustainability through devotion of particular resources and ownership Ease in benefiting from government aid	Risk of becoming unproductive due to failure to ensure ownership and provide the individual resources effectively, and failure to establish a good team
Türkiye Yenilik Teknolojileri Holding A.Ş. To Be Founded By the Government	
Gathering actors of the innovation ecosystem that have been or will be established across the country under one network structure for the purpose of building innovation centers to support the development and production of local and national critical innovative technologies to be build by MoIT Public benefit	Probability of state-run companies becoming unproductive

A general consensus on establishing the IC as a Joint-Stock Company (INC) stood out in the discussions during the workshop. One of the reasons for this is the ability to act fast and be flexible as a company, remaining negative impressions about cooperative systems in Turkey, and the fact that foundation works run much slower.

> *First of all, it must be autonomous, while at the same time fast and flexible, able to take immediate decisions. In thinking about how to get there, the INC. structure appears as an option.*

In terms of the partnership structure of an INC, the consensus is that the OIZ must be the controlling shareholder. However, it is still debatable whether the OIZ should own 100% or 51% of the shares. The discussed topics also included some of the critical stakeholders as minority shareholders giving contributions.

Having stakeholders participate, not as shareholders but as members of a consultative committee to be set up was touched upon as another option. It was remarked that it would be important to make sure that this consultative committee reflected the dynamics of the region. However, the fact that a too complex structure would not be able to work effectively has also been acknowledged.

Negative aspects of a Joint-Stock Company structure were highlighted as well.

> *INCs have some problems too. Then comes in the issue of its financing; if we're thinking of a financing model that is dependent on certain funds, a joint-stock company becomes questionable.*

3.3. Focusing on Certain Areas/Sectors

A third question that was tackled with at the workshop was "Should the Innovation Center be focused on particular areas/sectors? If so which ones?"

This question brought along an in-depth industrial policy discussion, and turned into "should we or should we not choose a sector for the goal of structural transformation?"
The crux of this discussion was based on various risks of concentration and diversification in respect of production capabilities. Concentration, that is to say developing certain sectors at first, not only may lead to missed opportunities, but also to making deficient decisions with partial information.

However, avoiding sectoral concentration and leaning towards diversification brings along risks such

as ineffective use of resources, and inefficient management of a complex process.

Participants urged on the necessity to have a high level of added value based on R&D and new products as the focus of the IC, rather than the matter of choosing a sector. Furthermore, concentrating on relationships between different sectors and developing multi-disciplinary collaborations at the intersections appeared as another priority.

> *I think it's really hard to say, I'll be doing sectoral concentration, for instance, I'll be involved in manufacturing, or its sub-branches, and I'm not going to be open to other things.*

Some of the participants emphasized the sectors. In terms of sectors, the remarks focused on the necessity to keep the information sector on the agenda; and having sectors like automotive, electronics, and whitegoods which constitute a major portion of the region among the areas of concentration.

> *Being thematic no longer brings anything to anyone. So aside from automotive, whitegoods sectors, and those that are close enough to interact with these sectors, for instance a company in the automotive supply industry manufacturing rim may come together with another company and tries to figure out a way to create a lighter rim. Things like that, not too thematic, but something with a narrower area of interaction can be taken into consideration.*

Others put the emphasis on the appropriateness of concentrating on areas of technology that intersect with all sectors and create added value rather than focusing on a particular sector. Especially areas like software, digitalization, smart specialization, design, clean technologies, robotics were brought up.

> *Rather than choosing a sector, nothing should be left out, provided that they support certain collaborations, certain synergies, and diversification of the regional economy, provided that it is innovative, provided that the R&D level is transformed into a particular stage, and provided that they support an increase in the innovative activities in the region.*

The general opinion of the participants is that the choice of a focus sector or value chain or concentrating on particular horizontal technologies would be beneficial. Even though it is not easy to draw sectoral lines and determine common needs and actions among companies, focusing on critical value chains (that are still prevalent or in development) in Manisa may add value to the functions and outputs of the IC. Especially the critical links of the focused value chains and the sub-sectors that have the potential to trigger multiple value chains (one that comes to mind during the first stage would be machine manufacturing, which can be influential in both the whitegoods and automotive supply industry) may become functional in the short run in making IC's influence visible.

Two topics need to be covered in order to transition to a framework of operation focused on developing horizontal technology (like digitalization) or entrepreneurship in the long run. The first is the sectoral diversification of Manisa's economy and the volume and additional opportunity that it may generate for the demand or new initiatives that will be created by these sectors in particular areas of technology. The second most important topic is the ways in which the IC will be positioned in the regional ecosystem in a way that will include Izmir within it. This necessitates an account of the ways in which the IC may have access to Izmir's resources, in order to bring them to the Manisa industry, and the types of services that can be offered to the companies or interfaces in Izmir as a potential market.

Things to prioritize for the Manisa industry were articulated as bringing together companies and start-ups and techno-initiatives towards product development and improvement of the productivity and innovation capacity of the industry. Additionally, it was highlighted that facilitating companies' access to support, financing and information in the short run would be a positive step towards making the IC's influence visible, and that companies might benefit from productivity-based reform as much as from innovation-based competition in the short and medium term. For instance, rubber technologies and mold technologies were mentioned as they might horizontally intersect with most sectors.

Another important matter that was touched upon during this discussion was the types of companies that would constitute the IC's body of beneficiaries. Some participants pointed out that large companies must be prioritized and helped in order to catch up with the future. Others drew attention to the strategic substance of accelerating medium-size companies that were able to go beyond a certain scale.

Some other participants went beyond the large-medium scale debate and remarked that the actual emphasis should be on supporting interactions between large and small scale-companies (especially start-ups).

It was reminded that even relatively large-scale companies among beneficiaries of the IC might have productivity restrictions, like not using IT systematically. In fact, a research study conducted by the OIZ was brought up, where 75 percent of approximately 200 companies in that regard did not have an IT unit, and did not use IT systematically.

Finally, determining the area of service was considered important. Choosing only the Manisa OIZ companies or generally the Manisa industry will also have an impact on the operations of the IC. Participants generally considered IC's area of service within the general Manisa ecosystem rather than just the companies in the OIZ.

For the purpose of offering quality services to the industry, it is important that the IC matches the capacities available in Izmir, Istanbul-Ankara, and internationally.

In the name of ecosystem development in general, and the concentration of the IC specifically, it was stated that smart specialization and clustering approaches might be used by creating an effective Manisa-Izmir urban region setup.[16]

3.4. Relationship Between the OIZ and the Innovation Center

The fourth title focuses on *"How should the relationship between the Innovation Center and the OIZ be?"*

(i) Site selection for the IC: Should it be inside the OIZ?

The general feeling about this is that keeping the IC within the OIZ would be beneficial due to geographic proximity. On the other hand, positioning in the city center was also put forth as an alternative.

Generally looking at the Manisa ecosystem, it is possible to assume that there will be similar centers in downtown Manisa in the future, and that this may be influential in the spread of entrepreneurship and innovation culture in the city.

(ii) The ownership and identity of the IC: Should it only belong to the OIZ?

The general idea in this matter is that the OIZ should be at least the controlling shareholder or the principle stakeholder of the IC. It is believed that the OIZ, along with its members, constitute the force behind the Innovation Center during the foundation phase of the center, and that in addition to guaranteeing the supply of financial and human resources in the short run, it could also be influential in establishing reputation, as well trust in relations with the industrialists.

Nonetheless, following its development phase in the long term, the IC will separate itself from the OIZ and become a "center of attraction" in itself, making the relationship between the two more autonomous and one that is based on mutual interest.

> *Let the OIZ's percentage be higher, but it's best if we have a public institution as a partner as well. For example, STM can be our 20% partner, or a company structure of the government can be a partner. A government structure can be a partner to all innovation centers. It's good to have them as a guarantee for the structure. Public responsibility must be the most basic component.*

16 For such topics, it is considered beneficial to contact the Zafer Development Agency and the Izmir Development Agency, and to examine regional plans, as well as specific studies on innovation and industrial sectors.

Aside from this, the fact that finding a solution to the independency and autonomy problem of the IC must be prioritized was highlighted. In order to attain this goal, it was also mentioned that the qualifications of the team that will make the IC operational must be at the highest possible level.

On the other hand, the subject of confidentiality was pointed out, and the discussion included the risk of a conflict of interest with representatives of competitive companies in the OIZ's management that might become an agenda item especially in cases where the IC works with companies one-to-one. The way to manage this risk, as highlighted in the discussions, is to pay the utmost attention to confidentiality, and to make principles of confidentiality and reliability the primary values of the IC.

Furthermore, another risk is the relationship between IC's sustainability and the continuity of the management at the OIZ. In most OIZs that transitioned to General Assemblies, the change in management may also change the priorities, and evidently reduce the support given to long-term investments like the IC. However, it was also pointed out that this would not be a serious threat when it comes to the Manisa OIZ. The governance culture that is rooted in the Manisa OIZ facilitates the management of such risks.

3.5. Material Issues

The fifth question that the workshop tried to answer was "Should there be priorities (such as coordination, collaboration, innovativeness, skills development) for the Innovation Center? What should they be?"

It can be said that collaboration and skills development stood out in this area. Subtopics such as networking, mentorship, and capacity development were emphasized.

The topic of networking had a particular significance on the opinions that were shared. It was stated that the IC may create value that would re-weave (web spinner) the web of relationships between the companies in the ecosystem and the industrialists, restructure and develop the already existing relationships, and open up new relationship channels (tunnels).

All participants have emphasized the development of a strategic network of relationships that would bring results and create value, such as giving industrialists access to knowledge and commercial channels, matching them up with the appropriate expert institution, individuals and mentors on the basis of their problems, beyond a de facto relationship establishment and development.

The importance of systematically managing the relationships by using the resources that are brought by IT technologies in setting up and managing these networks, as well as of informal relationships based on personal relationships and trust, was highlighted.

Based on the remarks of the participants, the IC can be seen as a systematic and professional supplement, as well as an organic part of the network of relationships.

Good relationship management and networking appears to be crucial in catering to the wide range of needs of the industry using the few available personnel and limited organizational resources of the IC. In fact, the IC is expected to be able to effectively offer the available capacity in the ecosystem to the industrialists, to bring together the capacity outside of the ecosystem and the industrialists, and to provide guidance in creating the capacity needed in the ecosystem in other institutions.

Mentorship has also been one of the most emphasized topics. Mentorship was handled both as technical mentorship regarding scientific, technological and technical topics in areas of production of companies, and as something that is non-technical, encompassing areas such as public applications and grants or marketing strategies of companies. In this regard, the function of being a mediator and facilitator-integrator that would provide opportunities to the company managements to collaborate with expert institutions and individuals who can guide them and give them access to information in topics like self-diagnosis and productive and innovative production was also expressed.

Capacity development was another basic topic discussed. In this regard, the IC is expected to offer assistance and guidance to other institutions in the ecosystem to develop their capacities. It is possible to say that the general expectation of the participants here was the expansion of culture of innovation towards both the industrial production, and urban lifestyle in the long run.

Another topic discussed was to give companies access to multiple services. Participants talked about the ability to exclusively direct companies to the right address and in the right manner regarding complex and numerous bureaucratic transactions, grants and processes. It can be suggested that the IC may consult and collaborate with the Zafer Development Agency Investment Support Office on this topic.

The matter of becoming an attractive social hub for the entrepreneurs was another topic mentioned in relation to the IC. Aside from its activities, conducting these activities through innovative methods, and in appropriate locations (for instance, locations like Originn Izmir, CoZone Ankara where there is an opportunity for co-working and networking, with suitable meeting and co-working areas, designed for the right purpose) will make the IC attractive not only to the entrepreneurs but also to the industry employees who would like to improve their skills, test their ideas and transform them into

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products, and discuss a problem they encountered in the industry with their peers. This way, innovation and innovation culture will be easily expanded throughout the industry.

The priorities underscored by the participants are as follows:

- Development of networks with research institutions and universities, immediate positioning of the IC as a network center,

- Determining problems in the group of beneficiary companies, and making matches with possible solution providers based on these problems,

- Concrete initiatives in the areas of open innovation and open data,

- Especially in order to strengthen the testing infrastructure and to reduce the costs in this area; taking inventories of machines/devices/ infrastructure that may be open to shared use as well as their locations, giving beneficiary companies access to this information; and then transforming this initiative into a common testing center,

- Compilation of good examples for innovation management in the region, making case analyses, and sharing them with the target groups.

Some of the participants urged upon getting some concrete outputs in the short run and making the impact more visible, and suggested that a single topic must be concentrated on based on the sectoral needs.

> *What should the Innovation Center do? Firstly, it should determine what the industry requires so that it can write a success story. If it does not, and the businesspeople are not satisfied, this will not be suitable. When they get there a year later they have to answer the question: "What did you do?"*

Some of the participants avoided pointing at priorities; and instead highlighted the requirement for conducting a needs analysis. Therefore, the primary outcome from this debate was to determine priorities after a needs analysis.

3.6. Organization and Its Personnel Structure Personnel Qualifications

The sixth topic handled by the workshop was "How should the organization and personnel structure of the Innovation Center be? What qualifications to look for in the personnel?"

This topic has led to the most fervent debates during the whole workshop. Because this particular subject included components such as the differentiation of the Y generation from the current dominant management generation, the quality of life in Manisa, and the cultural differences between Manisa and Izmir.

While a "broad consultation/guidance committee" that builds relationships between the center and its inner circle was proposed, another suggestion was to have a board of directors/ executive board that can make decisions in a quick and flexible manner.

It was highlighted that human resources is a critical factor in the management of this type of structures, and that excited, fascinating, inclusive and motivating personalities who are also very curious to learn more must become prominent. Aside from technical competences, the importance of personality traits was also emphasized. The importance of designing the management structure as professional, autonomous, independent, and away from external influences was underlined.
A common attitude emerged towards the organization having a small number of personnel working as a team, rather than having a comprehensive structure, making human resources flexible enough that it could expand or shrink based on the needs. This is because this structure is primarily expected to get information and operation networks and to use them in favor of the industrialists.

While stating that it was very important to have human resources in this nature, the personnel was characterized with "Superman" or "Grey Personnel". Grey personnel refers to the qualified personnel who can understand the industry, technology, and technology development, who can speak the language of the industrialist, academia, and the institutions, who can build communication and relationships between these stakeholders, who can develop networks, identify problems and translate and resolve them, who can match urban agenda and international trends with the working areas. Superman, on the other hand, characterizes people who are not easy to find in the labor market, who have knowledge in various areas and communication skills, rather than being an expert in one particular topic.

While some of the participants mentioned that even though it is possible that over time such personnel may emerge, a participant stated at the common meeting convened

with other groups following the group workshop that personnel with similar qualifications have actually been trained in projects conducted in other cities, however due to lack of sustainability in the project activities, these individuals were employed in ordinary jobs in industrial enterprises.

> *You need people with briefcases in order to make somewhere the center. Both the university and the industry are growing. Able to work in technology and do the transfer when it comes to technology transfer. We need people with briefcases, we need grey people. We are short of such people. In this model, we have to design the man whom we will position inside the Innovation Center, we have to establish this mindset, because this person should be able speak like an industrialist to an industrialist, and like an academic to an academic, they need to seal the deal. If we can't seal the deal, the center will be left without a function.*

The debate ran in two sections; the first one tried to identify the profile who will manage the IC; and it was followed by detailing of the team features that will be employed in the IC.

Qualifications of a leader/manager

- Someone who knows both sides (industry and university); who is close to the field; spent 75 percent of his/her career in the industry but able to comfortably speak to the academics; at least holding a master's degree, preferably graduated from a doctoral program,

- Experienced in innovation management and commercialization, academic as well as practical experiences in these areas with significant achievements,

- Having worked at a similar organization as IC if possible, and preferably abroad, with management experience,

- Having a high level of ethical values in topics especially like confidentiality, as well as the capacity to convince the IC in long-term strategic areas,

- Having a personality that is positive, independent and flexible,

- Having the vision and perspective to train the team.

Things that are suggested to consider in selecting employees, and required qualifications

- A core, full-time team must be set up in the IC - on the periphery of this team, there must be a pool of part-time (project/work based) employees,

- Since a majority of this team will be young, naturally the differences of the Y generation must be taken into consideration; how components like patience, faithfulness, work discipline and hours, expectations, flexibility may influence the performance of the IC must be discussed,

- Reverse brain drain programs through government promotion may be benefited from; qualified and suitable personnel who have been

abroad can be recruited to the team, the application of TUBITAK in this regard can be expanded in a way that will include the ICs,

- While a portion of the team may be transferred as having similar job experiences; some may be included in the staff to be trained afterwards, and significant investments can be made for these people; at some point, if these trained people leave the IC and go to other institutions, this should not be seen as the IC's loss, but a win for the ecosystem,

- It should not be forgotten that certain critical "soft" skills are also important, as much as the professional and engineering knowledge in innovation management and commercialization; they must have traits like communication, team membership, leadership, motivation, and internal harmony.

Aside from these, some of the participants suggested that the manager and the team must have an industry background.

> *I believe there must be people who are coming from within the industry, who are trained in these areas. There must be people who are primarily trained in the industry, and then able to adapt to a governmental structure. It is very beneficial to gain experience first in the private sector. There must be people who are capable of resolving what you need in the legislation under chaos.*

On the other hand, the generic titles below come to the forefront when it comes to the qualifications required for the employees.

- Solution and result-oriented,

- Having the knowledge, skills and vision to address the correct solution,

- Having self-motivation,

- Knowledge of local companies, and able to build dialogue with them,

- Having a global perspective,

- Having the ability to correctly read future trends,

- Having the competence to speak with large companies and start-ups, as well as the public and private sector in various levels and different communication languages,

- Industrialist/Company friendly/agile-nimble/integrator,

- Autonomous/Free from company pressure at the OIZs,

- Long-term business designer,

- Multi-lingual, multi-cultural/ multidisciplinary structure,

- Able to establish network structures,

- Able to discover facilitator-unfunded good projects in accessing funds.

3.7. Financing and Sustainability

The seventh topic of the debate was the question, "How should the financing of the Innovation Center be?"

Majority of the participants emphasized the need for resource diversity. The Fraunhofer resource structure was especially highlighted as a possible guide in designing the financing model of the IC. In this model, 1/3 of the central income comes from steady government aid, 1/3 from competitive projects, and another 1/3 comes from the income gained from the services provided.

The debate continued around this model:

Stable aid includes both government aid for the IC, and the amount to be transferred by the Manisa OIZ. OIZ representatives verbalized Manisa OIZ's will to provide a significant amount of transfer of goods to the IC. Such an amount will allow the IC to be able to focus on long-term topics, as well as to survive until the other two sources of income are able to emerge. Allocation of resources to the ICs as part of the 2020 Public Investment Program, as well as the Manisa OIZ's willingness to transfer resources are short-term opportunities for the Manisa OIZ IC.

Competitive projects experienced an increase in the opportunities arising in Turkey in the recent years, and many institutions are known to have provided support to interface structures like the IC for particular purpose-driven projects in the form of donations or other means. Guided projects and donation programs of the Development Agency, TUBITAK's SAYEM and TTO programs, KOSGEB's renewed TEKMER endorsements are examples for such support.

Service income is an income item that may mature much later compared to the other two sources of income. However, in the long run and in achieving sustainability of the IC, and bearing the fruits of all the benefits it provides to the companies and the ecosystem, it is the most critical income item. Pricing for the company-specific service charges was especially emphasized.

In terms of the risks, a higher ratio of stable aid among all the income may drive the IC to lethargy, and snatch it away from the needs of the ecosystem; if the project rate is high, then this may paint the IC as a "project hunter", and cut it off from long-term priorities. The most reasonable way to balance these two risks, as discussed, is to increase the service incomes up to 1/3 in the IC's sources of income.

In addition to these, some of the participants suggested that companies in the region would pay a share for the IC in relation to their OIZ membership fees.

On the other hand, the importance of seeking mechanisms in the long run that would help the IC to gain financial return from the innovations it triggered, was emphasized. Furthermore, it was discussed whether it could be beneficial to create a system towards giving shares to the IC personnel from the value created using a bonus system.

Finally, as one of IC's ultimate objectives, operating certain programs on behalf of the government and becoming a program operator was discussed. TTGV's management of a Ministry of Economy program in the past regarding internationalization and technology can be shown as an example to such operations.

It was remarked that the center might start creating its own financing in the medium and long run, and for that purpose it might support its financing by pricing its services as they become more systematized. On the other hand, emphasis was made on the possibility that the center might provide additional financing with projects by becoming a strategic solution partner or strategic partner, and that such a financing would be necessary in order for the center to recruit its initial talents and conduct its first applications.

Becoming a subcontractor in project-based provision of financing was evaluated as a risk. Because creating funds is not a goal but a tool for the center.

In that framework, it is possible to say that strategic partnerships should not be for fund creation, but for actualizing common goals, and for the sake of the industry.

> *First of all, there must be some sort of income from the consultation services it provides. This may be a one-time thing, or a particular percentage from the revenue of the company as direct result of this service. The incubator period must be transferred from the public domain for 3-5 years.*

Aside from what has been summarized above, the workshop also indicated that the IC might only prove its financial sustainability 5-8 years from now; that the first 3 years would be part of a preparation phase, the second 3-year period would be a period of self-sufficiency, and the following 3 years would be to create value and make profit.

> *This innovation center will operate for 5 years, and then it will yield its first output, and then fail among the outputs. Then at the end of a decade, it will be matured. Other than that, in 2-3 years from now, it will not gain output. I mean, we couldn't do it at the end of the 7th year. It will gradually get there by adding one by one in terms of new technologies. Initially we talked about financial sustainability, there will be loss. There will be loss for 4 or 5 years, and then maturity will come. We have to understand this reality.*

Therefore, the need for government aid for the financing of the center and its activities in the short run was emphasized. Furthermore, some participants insisted that certain outputs must be gained in the short run as well.

> *What should the Innovation Center do? Firstly, it should determine what the industry requires so that it can write a success story. If it does not, and the businesspeople are not satisfied, this will not be suitable. When they get there a year later they have to answer the question: "What did you do?"*

In that sense, a structure that can demonstrate competence in the short run with some works, provided that it is known that the real success of the IC will emerge in the medium and long run.

3.8. Relationships/Collaborations With Other Institutions

The eighth title in the workshop searched for an answer to the question "How should the relationship/Collaboration of the Innovation Center with other Institutions (such as Technopark, TTO, and TSG) Be?" However, since this was covered under other titles (1, 2, 5) the discussion was kept short under this section.

While the autonomous nature of the center is emphasized, it is possible to set up its relations with other institutions based on mutual benefits. With this approach, risks like becoming a subcontractor or being dominated by other powerful companies will be avoided. Especially in the foundation and development phases, it is important not to be repetitive but to be focused on being supplementary, reduce the foundation phase risks, and develop relationships and networks.

On the other hand, in light of the experience gained within Izmir's developing ecosystem, it is possible to see that it will transition from being repetitive to supplementary, with the common understanding and the comprehensive ecosystem developed in the long term.

While establishing such relationships, becoming a strategic solution partner for institutions like the Development Agency and TUBITAK which have coordination and subsidizing functions in their own assigned positions may be considered, the university and technocity collaboration can be conceptualized as "coopetition" (competition along with collaboration or collaboration along with competition).

On the other hand, areas of duty, the attitudes and capacities of the institutions must be analytically discussed with the management of the Technocity and TTO, giving weight to the principle of being supplementary.

The initial point that was emphasized in order to develop relationships and collaborations with the stakeholders was the necessity to establish a Consultancy Committee. However, in light of the fruitless experiences of the past, according to the discussions, the number of members of such a committee must be between 7-8. The general view that emerged was the necessity to create an optional balance between participation and

productivity. In that regard, it was suggested that the Technology Platforms built by TUBITAK in the past could be an inspiration; and that working groups and stakeholders might contribute to the IC in the thematic areas.

> *Various platforms may be established. Additionally, other actors in the ecosystem must be in the consultancy committee of this structure.*

It was highlighted that the Manisa OIZ had an extensive operating practice and experience in developing collaborations and building constructive relationships with stakeholders, and MOSTEM (Private Vocational and Technical High School of Manisa Organized Industry Zone) was shown as an example.

While stakeholder participation was considered important in the areas of the IC's strategic guidance, access to critical networks, creating value for the ecosystem and the Manisa industry, and establishing its transparency, striking a balance between participation and activity. That is because participation in the form of short term and large committees create an additional workload and cost in stakeholder management and reporting for a small organization, and it may also lead to additional burden and eventually an unwillingness among participants. Therefore, aside from official participation structures comprising of a more limited number of participants, informal consultation, advisory, and collaboration mechanisms were discussed, as they could be developed by the relationships established by the IC manager and personnel, and have the potential to grow depending on the topic and along with the corporate culture.

3.9. Vision, Strategy and Objectives

The ninth item tackled with by the working group was the question, "How should the vision, strategy and objectives of the Innovation Center be?"

The debate under this title was conducted by focusing on vision, strategy and objectives as much as possible. It must be noted that a consensus-based vision development exercise was not performed; so it will be beneficial to do this in the following stage.

Elements of vision:
It is possible to mention that there was consensus on commercializing the R&D performed in the region, improving the added value of the production structure, and gaining place in the global market based on innovation among all elements of the vision.

> *Vision is an ideal, but it also has to be convincing. About the mission... The mission is why we exist. Here's what I believe. In order for the MOIZ Innovation Center to improve the innovation capacities of the institutions that already exist in the region, providing benefits to the companies and satisfaction to the stakeholders by means of using national and international collaborations as management in order to position products and service processes. Mission includes becoming an innovation transfer center. The actually critical thing, I think, that will define the vision and mission more clearly, is the strategic objectives, that is what will the institution serve?*

Another agreed-upon topic regarding the vision is the matter of collaborations; almost all participants have pointed out the importance of benefiting from collaborations in order to improve innovation capacity.

Another vision-relevant topic was the undertaking of a catalyst function "that would transform potential energy into kinetic energy". This draws the attention to the importance of the IC taking on the function of an "orchestra conductor".

The IC's target audience is anticipated to grow in full flood. It was suggested that while focusing on Manisa OIZ at the first stage, companies located outside of Manisa OIZ and in the Izmir-Manisa region should be targeted at the second stage. It was emphasis that at the third stage, companies on the Izmir-Istanbul axis should become the focus. Finally, the importance of adopting a perspective that takes international markets into account was underlined.

The significance of IC having a long-term perspective, but also achieving concrete results in the short run that would help prove itself before the stakeholders and fund providers were emphasized. Sharing success stories will be important in that sense.
Within this scope, the participants explained the vision as follows.

"Expanding innovativeness and the culture of creating value, and transforming the industrialist into a competitor"

> *The purpose must be commercialization. Let's innovate for 10 years, but if it doesn't have any revenue, no added value, that means nothing is gained. We still lose money. The government and stakeholders give grants, but we cannot use this knowledge. Our problems are resolved, yes, the company within the industry resolves my problem, but that resolution is in limited quantities, it just covers the daily work. That's not vision. Vision must be concrete. Objective must be hard.*

Possible strategies:
After identifying the vision in general terms, the participants preferred not to seek a detailed strategy with the idea that the strategies required to be followed in order to attain this vision could be worked on separately.

"Being Supplementary in the Ecosystem", "collaborations"; "Information-know-how support" can be among the possible strategy highlights.

There are two main center lines to establish a general strategic positioning for the Center;
1. Being in compliance with the vision of the city as much as with the sector/ technology it focuses on,
2. Contributing to the national and international development objectives.

It was emphasized that the center might attain this vision by means of sense of innovation and innovative methods, and that it cannot behave like an ordinary institution.

> *It may guide me in how I can direct all the engineering talents we have to different places other than my current product portfolio. It would be beneficial in terms of interaction. It must be a guide in terms of strategies, trends, and what the philosophy should be.*

Strategies and objectives were evaluated as follows in the form of short, medium and long-term in order to better express the center's development strategies:

Short Term: Foundation, Learning and Acknowledgement
- Establishing and developing the team,
- Initial relationships, initial contacts: Partnership development within the region, "tunnel creation" outside of the region
- Initial capacity development activities (innovation, open innovation, possible joint works)
- Creating awareness, activities of mutual thinking-implementing
- Learning and rapidly creating value for the industrialist - Productivity: Foreign trade, marketing, lean production mentorship

- Innovativeness-pilot implementations:

  - *One-to-one identification, evaluation of companies, development of action plans, innovativeness and competitive power with companies. For example, MARKA - INNOTEAM, IZKA - Digitalization works*

  - *Topics that are social and able to create environmental added value, such as circular economy or comprehensive industry development can be considered among the working topics*

Medium Term: Professionalization and Diversification

- Developing as a solution partner to Coordinating/Guiding Institutions

  - *Development Agency, TUBITAK, etc.*

- Developing as a strategic partner of the ecosystem institutions

  - *Including the university, Technocity, and relevant Izmir ecosystem institutions*

- Systematizing network relations

  - *Establishing-maturing mentor, expert, stakeholder pools*

  - *Development and diversification of out-of-region relations (Tunnel expansion and development)*

- Systematizing - privatizing services

  - *Activities that are problem/ opportunity-oriented, such as Hackathon, pitching*

  - *Product/service development, application, pricing from pilot implementations or new designs*

  - *Diversification and systematization of performance communities*

Long-Term: Effective Networking Actor

Due to more uncertainty in the long run, participants did not present net objectives and actions. However, they expressed that the center would, in the long run, become one of the effective and constant actors of the local ecosystem and the network of relationships, and might contribute to innovation, industrial development and urban vision.

Under such uncertainties, for instance, while the debate continued as to whether artificial intelligence would render IC's functions outdated or not, it was still a question whether artificial intelligence could be seen as a threat or an opportunity. However, it is believed that the center can survive by adding quality and value to the local ecosystem and the networks of relationships.

Another strategic preference that can be foreseen in the long run is whether the IC will be positioned as an influential actor of the OIZ, or Manisa, or the urban region that includes Izmir.

Possible metrics, problems of measurement: As a last topic in this session, the participants discussed how to measure and monitor the objectives. There was no consensus on this topic either, and it would be beneficial to conduct a detailed study with experts of this area.

> *The general performance of the system must be measured here, but beyond that we need a system that can measure the performance of the system's partners. You can call that an innovativeness index. We already have a data gathering performance, a screening study conducted by our Organized Industry Zone. We can start from there as well. We need such an indicator. We need to know where our stakeholders will be in 1 year, in 2-5 years.*

The most important problem here is the difficulties in measuring innovation. The misleading nature of input measurement-based approaches (number of patents, amount of R&D, etc.) was pointed at. It was highlighted that output or result-oriented indicators (kilogram value of production or exports, shares of new products within the turnover, etc.) might reflect performance better, but it was not easy to access this type of data.

3.10. Communication Strategy

The workshop completed its work by discussing the question, "How should the communication strategy of the Innovation Center be?"

The most significant question that stood out in this debate was, "Should it be a common communication with the other Innovation Centers in the country, or something specific to the Manisa OIZ?"

> *Human relations are critical. The ways in which we will establish communication with the people of the region (all actors in the ecosystem) become one of the most important elements.*

The recent foundations of innovation centers across the country as part of various projects / initiatives bring along the risk of engendering a chaos of communication. It was highlighted that regardless of this risk, while it was possible to design a communication strategy specific to the Manisa OIZ, in either case it was necessary to seek professional services in this area; it was reminded that the dimension of internationalization was also important in the establishment of a communication strategy.

It can be said that a communication strategy that is generally focused on the mutually created common value must be adopted, that a "patronizing" style due to public power and implementation, or an "apologetic" communication language built around concerns of repetitiveness with regards to the other ecosystem institutions must be avoided.

Furthermore, it was mentioned that a brand strategy could be considered, which would allow for contemplating certain areas, target audiences to

feature and make visible the IC, and to what extent this can be done.

> *When it comes to communications, you have parties. Parties in a network, the people of the city, employees in the OIZ, and their children. Since this is something we're trying to manage as the OIZ, there are several aspects to it. Expressing yourself over social networks, adding value to the city, and making sure the city acknowledges it etc. will start to happen in the second phase. While Manisa's embracing it makes it a self-sufficient enterprise in the first phase, in the second phase, we add some values to the city, we make efforts towards innovation in schools or maybe in industry, and we touch people. We are currently discussing where we should open an art center if we are to open one. Getting integrated with the city does have a serious effect. This organization will have a problem as well. Not a problem per se, but more of a need for something to get better.*

It was voiced that it would be useful for the communication strategy to highlight the elements of transparency, collaboration and mutual benefit/value in a way that would be functional in the processes of establishing relationships, building trust and acknowledgement in the short term.

In the medium-long term, it can be said that it will be useful for the center, which has become professional and focuses on the vision of the industry and the city by strengthening the relationships with companies and actors, to adopt a communication strategy which features the common future design with the values to be created for Manisa, Manisa industry and the strategic partnerships.

> *Using the communication channel is also very necessary to collect things and make them a part of the system. A dependency on the grey men we talked about before or the executive director emerges. When that person is gone, the communication and network can get weak. We should find ways to integrate what these people do into the structure and make the structure embrace it. This aspect should be included in the communication strategy as well.*

In this regard, the participants highlighted the points below.

- Building up a network structure communication with components related to and supporting each other, instead of individual structures,
- Focusing on creating added value,
- Simple, clear and straight message content,
- Brand value creation/Brand building process management,
- Preparing the communication strategy of the Innovation Center - Sustainable dialog

3.11. End-of-Chapter Review

In general, an efficient discussion was held at the workshop and in the working groups. Participants' efforts contributed directly to the agenda as much as possible, and the setup of the workshop and the clarity of the questions prepared contributed to the efficiency of the discussion.

> *For the first time in an event, the ecosystems of Izmir and Manisa are brought together in such a composition. I consider this as a huge step at the starting point. This means that this point of view and these 10 questions actually form the essential dimension of the great feasibility that we use as a Development Agency. And when you can answer these questions and talk about them, you get a chance for actual central planning and decision making.*

The results of this discussion have been summarized under 10 topics in this report. While this discussion enabled some critical issues to be tested before the stakeholders, these findings alone are not sufficient to carry out the feasibility study of the Innovation Center. Within this scope, data for the "Needs Analysis of the Manisa OIZ Innovation Center" was collected, and the outputs of this workshop were evaluated together with this analysis.

Consequently, it will be beneficial to underline the following points:

- It was seen that the level of the Manisa OIZ's embracing this enterprise is rather high. Although this embracement is positive, to what extent it is shared by the board members and industrialists should be confirmed.

- The capacity of companies to employ the services provided by the Innovation Center should be investigated. While doing this, both the transformative and problem-solving functions of the Innovation Center should be used together.

- On the second day of the workshop, the discussion about the identification of risks was quite useful. It is important to work on such topics, prioritize the risks and develop substantial risk management strategies.

- It is important to plan the agenda of the Innovation Center, especially for the "first 100 days" and the "first 3 years", in line with a needs analysis which will need to be undertaken. Also, it will be useful to include the Director of the Innovation Center in such processes. It is understood that there is no significant obstacle to start this process.

In this context, as there are some similarities with the activities and process of "Turkey's Automobile Joint

Venture Group", it is considered useful to observe that process as well.

It is thought that this analysis provides a resourceful content on the key elements of the establishment of the Innovation Center.

- In this sense, it is concluded that the following processes will lead us to successful results: the innovation center will be established with the vision of "transforming industrialists in a competitive manner by spreading the culture of innovation and value creation" as a small, flexible and agile structure by evaluating the corporate and cooperative status,

- The areas and subjects of activity will be identified in consideration of both Manisa and Izmir-Manisa urban regions as a whole,

- A close relationship will be established with Manisa OIZ at least in the short term, and partnerships with structures such as development agencies, TUBITAK, universities, technoparks and TTOs will be developed,

- Qualified personnel in different specialties and functions with strong communication skills will be employed,

- The establishment process will be completed successfully and good relations with stakeholders will be established in the short term, and in the medium term, the Innovation Center will be professionalized and will systemize and diversify its services and start generating its own revenues,

- The communication strategy will focus on complementarity, collaboration and common benefit by reinforcing the trust element in a way to support the corporate strategy in the short term, and in the medium-long term, on the contribution to the vision of the industry and the city, and the value created on this ground in parallel with the influential position of the Innovation Center in the ecosystem.

It is concluded that especially in the group work, participants coming from Izmir are willing to contribute, and their contribution is qualified and useful. In this sense, it will be beneficial to maintain collaborative relationships with these stakeholders in the upcoming periods.

> *Every opinion has value, everyone shared their knowledge. But when everyone shares like this, what we get is something like an encyclopedia. In this context, it becomes rather important to consolidate this information. To sort all this information out, to consolidate it and then refine to get a meaningful whole is a challenging task.*

On the other hand, it is considered that the choices to be made regarding the strategic positioning of the Innovation Center in a way that will affect every aspect of the establishment and development of the Center are of great importance.

Strengthening the Connection with Izmir - Joining in the Izmir Networks
It is of critical importance in terms of information sharing that the innovation actors participating in the workshop from Izmir are invited to Manisa at set times and that they are registered in a network under the name of the city's regional platform. In the region, the role of Manisa in production and Izmir in trade and design will determine how to attract the attention of creative people to the region and the position to be taken in urban marketing. Izmir has immense resources that are easily accessible for the Innovation Center's activities. There are mentors, experts and structures like universities, technoparks, R&D infrastructure and TTOs, which the Innovation Center can reach out to and collaborate with. Using these resources and structures will enable the Innovation Center to easily transfer knowledge, human resources, commercial connections and experience to the Manisa ecosystem and industrialists.

The importance of evaluating the activities of the Center within the scope of production for Manisa and commerce and design for Izmir in terms of city and region, as well as creating and operating platforms that gather the innovation and design actors of both cities was emphasized.

It was stated that communicative efforts should be initiated alongside the establishment works of the structure to save time when creating such platforms and to develop the necessary trust environment.

Focusing - Specialization:
In addition to the Manisa ecosystem, identifying the areas that can create a competitive advantage within the Izmir ecosystem and become integrated with Izmir will also provide the Innovation Center with the opportunity to create resources and provide services in Izmir. In this way, the Innovation Center will have the opportunity to diversify and scale services effectively not only in Manisa but also in Izmir, in the areas where it specializes and has a competitive advantage. Rather than an individual structure, the Center is intended to operate in relation and communication with the actors within the innovation ecosystem so that they support each other in a holistic manner. It is rather important for companies to identify their needs and to form the legal basis for a trust environment that will enable information flow for the management of big data.

The importance of determining the missing links in the production value chain in the region, inviting and encouraging the enterprises and investments in the areas where current sectors can generate more added value, and making smart investment promotions was emphasized.

It was stated that instead of focusing on a single sector, it would be useful to focus on technologies like design technologies, robotic technologies, cloud technologies, digitalization, software, smart specialization and clean technologies with a different approach intersecting together with all sectors. It is thought that this approach can be put into practice in the medium-long term for the positioning of the Innovation Center. The methods of impact evaluation analysis for such a structure to be established using public resources should be examined separately, and such examinations should be conducted simultaneously.

4 MOIZ INNOVATION CENTER NEEDS ANALYSIS

Manisa OIZ
Logistics Center

The needs analysis study was prepared based on the current situation assessment and field study to form the basis for the "Strategy and Road Map" to be prepared for the Manisa Organized Industrial Zone (MOIZ) Innovation Center (IC). This analysis depends on a detailed analysis of in-depth interviews with the representatives of the actors in the Manisa Regional Innovation system and the company representatives doing business in the MOIZ.

A field study that lasted around 20 days was carried out to identify participants' opinions on the Manisa OIZ IC's prioritized activities and structuring. In this context, 36 in-depth interviews were conducted with participants such as university, industry and public sector executives, entrepreneurs, academics, officials from the MOIZ and technopark.

Interviews conducted within the scope of this study are completely based on the participants' subjective opinions and comments depending on their knowledge and experience. In the study, these subjective evaluations were summarized systematically. Generally, in interviews and meetings, it can be seen that the persons whose opinions are asked reflect the perspective of the institutions they represent. In addition, it was seen that some independent actors that were not directly related to the Manisa OIZ IC made some evaluations as well.

The main question of this study, conducted for the main purpose of improving the services of the OIZ is "What primary services can the MOIZ offer in job and skill development, coordination, access to government aid, innovation, digitalization, R&D, and innovative class?"

4.1. Manisa Regional Innovation System

Programs and practices on industry, innovation and entrepreneurship policies, as well as government aid for SMEs, R&Ds and OIZs in Turkey is evolving in terms of both quality and quantity. These developments positively affect the performance of not only central cities like Ankara and Istanbul, but also cities like Manisa with a high development potential.

> *The main problem of Manisa is that people living in Manisa are agrarian elites. People are lazy as they have money, they don't want to embark on an enterprise. People of Manisa have a high amount of cash saving, but there are only just a couple of investors. Agriculture is an important source of input, but this cannot be transformed into products with high added value.*

If the MOIZ is put aside, the impact of the agricultural sector on the city can be clearly seen. And if Izmir is put aside, it can be said that Manisa seems to be a productive agricultural city in Anatolia.

Although this situation, which is perforated in the sociocultural texture of the city, seems to be a disadvantage in attracting the innovative class to the region, the geographical proximity to Izmir is more than enough to eliminate this disadvantage. This creates additional added value for the MOIZ. Therefore, the industry in Manisa is not negatively affected by the social, economic and cultural conditions of the city in terms of accessing and employing the innovative class. Approximately 90 percent of white-collar personnel in Manisa come from Izmir.

> *People earn money in Manisa but spend it in Izmir. Since social opportunities in Manisa are limited, even students use school buses to go to Manisa from Izmir. One of the problems caused by the proximity between Izmir and Manisa is that white-collar employees and young people do not stay and contribute to consumption in the city. In terms of investors, Izmir provides a great deal of advantage with such means as an airport and employees.*

The MOIZ is seen as a satellite industrial and living space located between Izmir and Manisa isolated from the city in functional and spatial terms. The OIZ created a distinct ecosystem with services like hotels, restaurants, cafes, markets, banks, as well as economic opportunities and industrial services.

Despite the social opportunities provided by the OIZ, the ways of working and doing business in the OIZ and throughout the industry indirectly limit the innovative class from leaving the factories and accessing such opportunities.

Generally, in working methods based on "Industry 2.0", an environment where white-collar personnel or R&D employees can socialize cannot be created due to such issues as the understanding of employment based on productivity, the concept of overtime and the obligation of staff to be in the factory, the failure to apply flexible working principles, and insufficient attention to innovation.

At Vestel, for example, approximately 5,000 white-collar personnel enter the factory every day, work their shifts and leave the factory after work. It is observed that in the OIZ the employees of companies that are relatively developed and that do business based on R&D and innovation tend to meet their basic and social needs within the company, and they have almost no relationship with employees from other companies and institutions in the OIZ.

> *Manisa has a great potential. There are influential companies here. Automotive supply industry, electronics and white-good appliances are among the leading sectors. I think that someone should lead and guide these companies. Maybe the IC can serve this purpose.*

In this context, there is a need to create common areas and opportunities within the OIZ where the innovative class can come together while innovation capacity in companies is enhanced.

> *In Manisa, people tend to be conservative and unwilling to take risks in the process of transition from the conventional structure to an innovative one. There are lots of successful companies and they try hard to create an identity. However, instead of pursuing this attempt, they prefer contract manufacturing due to economic, social and cultural limitations.*

As a result of the government policy and aid activities, the number of R&D centers in Manisa has increased to 32 in recent years. However, R&D and innovation capacity has not developed sufficiently in Manisa. All of these centers are located only within the Manisa OIZ. While it is still important to increase the collaboration and communication of R&D centers among themselves and with other actors of the innovation ecosystem, there are significant gaps in information sharing, participation in national and international project markets, joint project development, pre-competitive collaboration and especially in commercialization.

On the other hand, the R&D centers in Manisa generally try to organize themselves. It will be beneficial to assess the possibility of this collaboration to turn into quality projects and practices based on trust in the needs analysis.

> *We have seen platforms repeat themselves in many instances, because people think bigger than they should and do not focus on the smaller scale. Here, we have started with small collaboration attempts that can provide us with exact operations as we have seen that progress cannot be achieved on larger scales. This platform of R&D centers has granted us a collaboration opportunity. Routine holds us back, collaboration over this platform can be useful.*

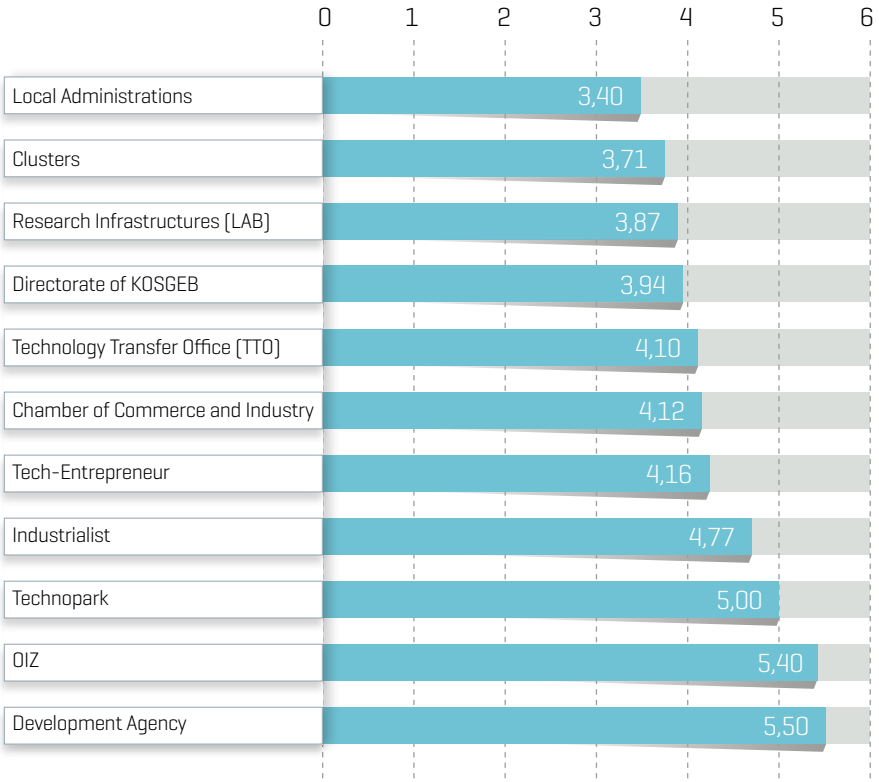
After this general evaluation, the findings of the field study conducted in Manisa can be discussed.

4.1.1. ACTORS OF THE MANISA REGIONAL INNOVATION SYSTEM

In the interviews, the participants were asked about the success levels of the actors of MRIS. In the study, a 7-point Likert scale was used. In the answers, a score of 7 refers to very successful, 1 to very unsuccessful and 4 to the exact middle point. Gradually, the points above 4 are interpreted as referring to being successful and the points below 4 to being unsuccessful.

The data including the participants' opinions on the success levels of the actors of MRIS is given in Figure 1. When the scores given to the actors for the ecosystem are averaged, the average score of MRIS is around 4.31, meaning neither successful nor unsuccessful. Participants considered the Development Agency in Manisa as the most successful actor, while the Manisa OIZ and technopark ranked second and third. The participants gave low scores for the success of local administrations, clusters and KOSGEB.

Graph 1 **Evaluation on Success of MRIS Actors**



Based on this evaluation, for the whole system to be more effective, it can be concluded that:

(i) All actors in Manisa, regardless of their success levels, should improve their services,

(ii) The actors that are considered to be the most successful have the potential to improve their activities, and

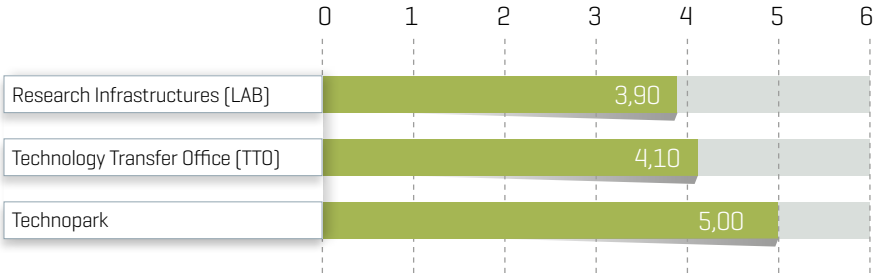
(iii) The actors that have a success level below average should undertake greater efforts.

MRIS actors were examined under three main topics in general, namely university (university and institutions within the university system), industry (organizations within the industrial sector) and public (public sector institutions). The participants' opinions on the said institutions are given under the topics below.

4.1.1.1. University

In this section, the scientific and technological capacity of Celal Bayar University and the general performance of the technopark, TTO and central laboratories (research infrastructure) built within the university were evaluated.

Graph 2 Evaluation on Success of MRIS University Actors



The average scores given for the success levels of technoparks, TTOs and research infrastructures, which are university-oriented and whose administrations are based on university culture, are respectively 5.0, 4.1 and 3.9 out of 7.

> *To be honest, Manisa is a little bit unqualified in terms of university professors. Izmir Institute of Technology is successful in this respect. As a matter of fact, we try to transfer the alumni from that university.*

The number of Manisa Celal Bayar University's activities to develop collaboration with industry has recently been increasing. In this context, positive developments were recorded such as the establishment of the technopark operating within the university and the rapid increase in the occupancy rate almost starting to operate at full capacity, and later the establishment of a TTO within the technopark.

On the other hand, apart from the central laboratory of the university, there is still no laboratory, research infrastructure and capacity that can provide effective and efficient service to the industry. To fill these gaps, some special tests, analysis, technology and product development systems have been introduced into the technopark with guided projects supported by the Development Agency. These projects can be seen as significant steps towards improving the collaboration between the university and industry.

The technopark received 5.1 points from the participants. This means that the participants find the technopark successful at a certain level. There are 92 companies operating in the technopark with a total of 293

employees (approximately 3 per company).

It can be said that the guided projects supported by the Development Agency increase the success and visibility of the technopark before the participants. However, the interaction and relations of the technopark with the participants are still limited.

The technopark hosts technology-based entrepreneurs and has a laboratory with devices, 3D printers and CNC machines that allow certain electronic tests used in the industry to be performed. These investments made in collaboration with Vestel also show that collaboration between the public sector, university and private sector can be used effectively.

While some companies in the technopark focus on the defense industry, others are looking for solutions to the regional economy's problems in the fields of software and informatics. And some tech entrepreneurs come from Istanbul to Manisa to operate in the technopark. These entrepreneurs compete within the Manisa ecosystem while doing business for Istanbul thanks to their network relationships. Those companies get a significant cost advantage by saving on wage expenditures and benefitting from the 3rd Region incentives in Manisa.

A TTO was established within the Technopark in 2019 in Manisa. It will take time for this TTO, which is still in its establishment phase, to be effective in a university-industry collaboration.

As a matter of fact, most of the participants stated that they were not yet aware of the activities of the TTO. Despite all the positive aspects of the Technopark, there is still no sufficiently developed culture of doing business with the Manisa industry and the OIZ. In particular, no systematic activity has been observed to develop the potential for collaboration between technology-based entrepreneurs and the industry. Therefore, improving the interaction between the technopark and the OIZ and matching the needs of the companies in these areas can be considered as an important potential area for Manisa.

Establishing Innovation Centers in regions where TTOs already exist can be considered as a risk. But in Manisa, establishing an IC should be perceived as an opportunity. If TTO and IC interfaces can effectively organize information-technology and production-industry backgrounds and make them suitable for interaction, the business network paths can be opened to enable collaboration between companies thanks to enhanced collaboration between the OIZ and Technopark.

Research infrastructures are established to conduct scientific studies, train researchers, and meet the R&D and innovation needs of the industry. These structures play an extremely critical role in university-industry collaboration. The participants gave an average score of 3.9 for research infrastructures and shared a common belief that these infrastructures were neither successful nor unsuccessful.

In addition to collaboration with the industry, several scientific and academic studies were undertaken in research infrastructures. These structures have significant potential to train the labor force. Lastly, spin-off companies emerge from some projects. These are generally in the form of academic entrepreneurship. Academic companies may have difficulties in commercialization and growth due to inadequate skills of entrepreneurship and may have a limited commercial performance at the following stages.

TTOs, which are designed as institutions to enable collaboration between university and industry, are among the university structures with serious structural issues. The TTO in Manisa got a score of 3.6 from the participants, which is the lowest given to the institutions within the university. With that being said, it can be stated that there is a common belief that the TTO has fallen behind the other structures related to the university, in terms of fulfilling its duties.

On the other hand, just like the approach adopted towards the establishment of technoparks across Turkey, the assumption that universities can transform themselves faster with the establishment and activities of TTOs is far from being realistic. This institutional structure, where all authority is granted to the actors associated with the university, constituted an entity with no regular income and no ability to connect with the ecosystem in a satisfactory way.

> *The companies in the technopark are not active enough. The academics in the university, except for a few, do not have sufficient knowledge about the industry.*

Mutual limitations like insufficient or unspoken demand on the industry side and inadequate number of innovative activities carried out in the university to meet the needs of the industry have pushed the TTOs to mostly write projects. For example, in Ankara with a deeper ecosystem, every university has its own TTO and there is no platform or coordination unit where these TTOs can collaborate and communicate.

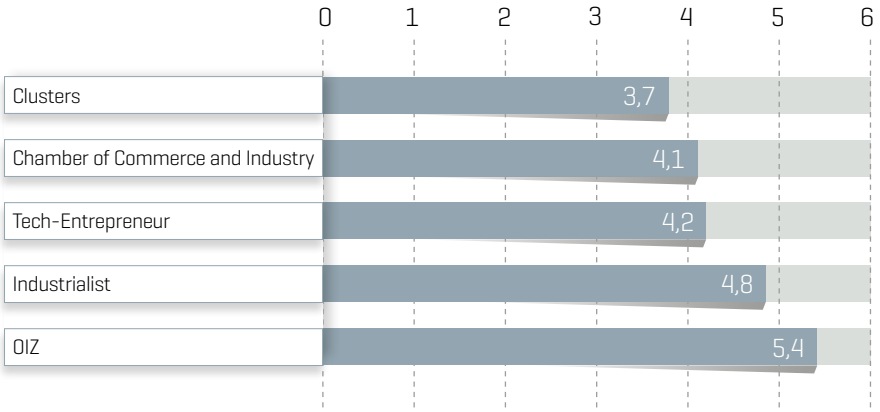
As a result, a structure has emerged within universities with limited influence including several institutions that operate in the same or similar areas of activity, establish their relationship with each other on competition rather than collaboration, and engage in competition to maintain their limited corporate presence instead of trying to achieve commercial or technological results. Therefore, it is seen beneficial to develop the infrastructure of the technopark, TTO and university in accordance with the characteristics of the industry in Manisa.

In this framework, it is considered that the Manisa OIZ IC that is planned to be established can meet the needs of skills and capacity development and collaborative operations in university-industry collaboration.

4.1.1.2. Industry

Under the title of industrial sector, tech-based entrepreneurs and industrialists operating in Manisa, The Manisa Chamber of Commerce and Industry, Manisa OIZ and cluster organizations planned to be established in the region were discussed.

Graph 3 Evaluation of Success of MRIS Industry Actors



The OIZ structure in Turkey plays an important role in the productivity economy. However, it is seen that these structures have not been able to hold an active position in the innovation economy yet. On the other hand, the MOIZ has won the hearts of industrialists not only with its infrastructure but also with the services it provides to industrialists, and it is among a few leading OIZs in Turkey in terms of services for productivity economy. In fact, this was confirmed by the participants as well. The participants showed that they found the Manisa OIZ successful with an average score of 5.4 given. However, the tools and actors of the regional innovation system like the TTO, technopark, business incubator, common R&D center, common R&D lab and common test and analysis lab do not exist in the Manisa OIZ.

Participants gave an average score of 4.8 to the industrialists, which means that they concluded that industrialists had a fairly successful performance. Sectoral differences and the size and manner of business might affect this perception of the participants. In general, industrialists do not have enough motivation, awareness or systematic perceptions that can turn into actions in terms of innovation and R&D except for the defense industry and some parallel sectors.

I don't think industrialists have the ability to identify their real problem. Even if they do, nothing changes when it comes to doing business or allowing us to do business from their point of view. Because they want to have the exact thing they do manually, on the computer. When I say that we can automatize everything, they say they want to write it all again. But we deal with this right at the beginning. We agree on continuing only if they trust us on this.

Industrial enterprises that produce for export, have an R&D center, and experience innovation activities with TUBITAK and KOSGEB projects have a great potential in developing collaboration based on innovation and R&D, and getting involved in joint ventures. Despite of this potential, it is not possible to say that these companies adequately collaborate with other industrialists or tech-entrepreneurs. Some of the examples observed during field studies show that companies tend to have strategies like acquiring startups or merging into them their companies instead of cooperating with them in projects and outsourcing talents.

As far as I can see, there is no such world where someone will come and say "we want a product with these specifications, go and work on it, carry out the R&D studies, we will certainly buy it from you", and there is never going to be. We created a road map for the projects we are involved in, and this road map says that we need to invest in minimization technologies.

Amongst the data, R&D centers show the competency of the industrialists quite clearly. While it was required to employ at least 50 full-time R&D employees in an R&D center in 2008, this number was decreased to 30 in 2014 and to 15 in 2016. The number of R&D centers in Manisa has been increasing since 2016 and has reached 32 as of January 2020.

The interaction between the R&D centers in the city of Manisa has improved over time. In 2019, the relationship between these centers started to take a corporate form, and collaborative operations started to be carried out to solve the problems in public institutions. Later on, certain training programs were organized, and efforts were made to continue such activities by forming several sub-groups.

It is considered that the IC can play an active role in developing this potential collaboration and its capacity and transforming it to be a platform that can be used to generate innovative projects.

In general, there is no common approach or ability for a brand-based production, and contract manufacturing is mostly preferred. The Insufficient innovative capacity of companies and substitutability of companies as suppliers hinder businesses from building a relationship based on trust with others and creating cooperative opportunities. This problem, experienced across Turkey, can be clearly seen in Manisa as well.

This can be clearly seen in the field surveys carried out, especially among molders.

However, electronics is one of the fields where a culture of cooperation has the potential to improve abilities, thanks to the impact of Vestel in Manisa and its spreading throughout the region. Realizing a cluster organization in relation to electronics in Manisa through the Innovation Center for this purpose can be considered among the topics that can be assessed in the needs analysis.

> *There is no leading company in our region, other than Vestel, to lead the way and generate suppliers. That's the exact reason behind the current situation. Even we are in a position where we stand alone in the automotive and molding. Therefore, we need something that can grow together with the potential in this region.*

The average of the scores given to tech-entrepreneurs is 4.2, which means that their performance is seen as close to medium level by the participants. As the technology and informatics industry in Manisa is limited, and tech-entrepreneurs do not interact with large industrial enterprises at an adequate level so there is no culture of cooperation developed.

On the other hand, some startups carry out studies for the defense industry or medical sector while some others focus on problems in the local industry and public services with the limited means and resources in their hands. In general, it can be said that technopark companies may have the ability to solve the software-related problems of industrial companies. However, it does not seem possible for technopark companies to develop new products or innovations and commercialize them.

> *We have two kinds of industrialist: those who are afraid to get out of their routine and those who get out of their routine and take risks by doing business under challenging circumstances. Both kinds should be supported. Also, we need to show the advantages, that the industrialists who get out of their routine have gained, to those who don't want to.*

Although the Manisa Chamber of Commerce and Industry (MTSO) has carried out significant work recently, the average score it got from the participants was 4.1 and was considered to have a medium-level success.

There is only one cluster that is actively doing business in Manisa. However, there are a few sectors where some activities are carried out. With the impact of Vestel, there is a need for clustering between subcontractor companies in electronics industry.

Clusters that are doing business received an average score of 3.34 from the participants. This score indicates that such structures are not very successful.

> *I don't find clusters successful because they don't perform the work they need to perform. They need to depend on the rational division of labor. What actually inspires a cluster is the formation of a structure that will create positive externalities. There needs to be a structure that creates positive externalities.*

4.1.1.3. Public

Within MRIS, Zafer Development Agency and KOSGEB as the public sector and Manisa Metropolitan Municipality as the local administration will be examined in this section.

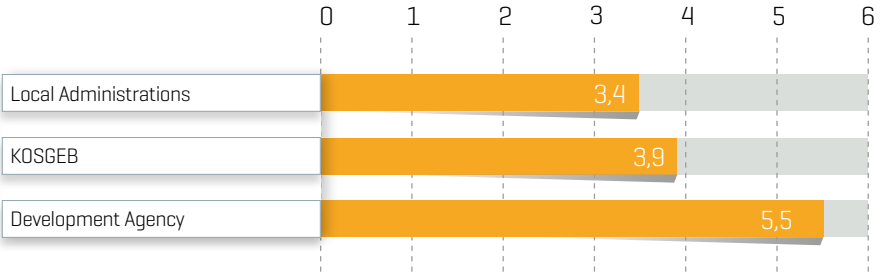
One of the important variables that determine the efficiency and productivity of regional innovation system is the competency levels of public enterprises and organizations operating in the region and their capacity to create policies and an appropriate environment for economic development and to coordinate and guide. Influential and powerful public enterprises play important roles in terms of strengthening sectors, increasing the competitive power of companies in the industry, and furthering regional development.

> *The Manisa OIZ is actually a small reflection of companies in Turkey. Companies in Turkey focus on products and turnover. The primary problem both in Turkey and Manisa is that R&D investments are limited and short-term as the return on R&D expenditure is uncertain. We have that problem as well, but the extent of this problem is smaller for us compared to other companies. Hence, we need to make that investment, see its return, and create alternatives. The problem is that such investment needs to be made for the longer term without any return expected. For this reason, government aid on this matter should be restructured.*

Within this context, the participants were consulted on the activities of Zafer Development Agency in Manisa, KOSGEB, and Manisa Metropolitan Municipality as the local administration with regards to regional innovation system.

The Zafer Development Agency got the highest score from the participants with an average point of 5.5. This score is not only the highest among public institutions but also among all actors in Manisa, which makes it even more notable. KOSGEB, on the other hand, received a score of 3.9 and was considered to be almost unsuccessful by the participants. Lastly, the Manisa Metropolitan Municipality got the lowest score (3.4) from the participants.

Graph 4 **Evaluation on Success of MRIS Public Actors**



The main reasons why the Development Agency displays a high performance include that:

(i) it tries to establish relationships with stakeholders and improve the relationships between them within the scope of the coordinator role that it plays in the region,

(ii) it contributes to the university-industry collaboration with its two guided projects on the needs in the region as an extension of this role.

Apart from its activities at the company and industry levels, Zafer Development Agency tries to act on a collective development understanding that pursues prioritized development matters in the region and in the city and drives support towards these prioritized areas. Zafer Development Agency's foundation and management by an institution with a development tradition (DPT – Former Ministry of Development) and in parallel with this, the Agency organization's (with corporate capacity and human resources) and the regional actors' ability to meet the technical requirements and to act in the light of local embracement and motivation, is contributed to the Agency's reputation as a prominent and successful institution.

Such factors such as KOSGEB's providing aid at a company level rather than for the whole ecosystem, failure to adequately analyze the effects of the aid, getting more negatively affected by the recent regulations implemented in the public sector, interruption of aid provided, and personnel changes have had negative impacts on the services that have been provided to companies and leads to negative thoughts in the actors in the ecosystem about KOSGEB. Local administrations in general and municipalities in particular did not play an active role in terms of development of entrepreneurship, innovation ad R&D ecosystem in Turkey until recently. However, in recent years, especially Ankara, Istanbul and Izmir metropolitan municipalities are working to extend such implementations as cycle lanes and 24-hour transportation for the purpose of increasing the quality of services provided in entrepreneurship and innovation, availing of digital means to improve their services, getting services from technology-based enterprises, making the city attractive for the innovative class, and

increasing the quality of life. Nevertheless, such implementations are not commonly adopted in other cities including Manisa.

The Manisa Metropolitan Municipality conducts the first phases of restructuring to become a metropolitan municipality and focuses on other problems of the city at the same time. In addition, since municipalities have limited authority in technoparks (located within universities) and OIZs, these centers are far from being in the implementation area of local administrations.

4.2. Structuring of the Manisa OIZ Innovation Center

After the evaluation of actors within the Manisa Regional Innovation System, the structure of the planned Manisa OIZ Innovation Center was discussed in detail with the participants. In this scope, the participants were asked for their opinions on the priorities of the Innovation Center as well as activities and areas to be focused on. The structure, functions and risks of the IC were discussed before the end of the interviews.

The common issue mentioned regarding the design of the IC is the need for a balance in terms of the authority, duties and functions of the IC compared to those of the current actors in the ecosystem and a focus on an effective corporate structure together. Some of the participants are hesitant about the establishment of a new institution due to the excessive number of deficiencies in the system and relatively inadequate performance of the current institutions.

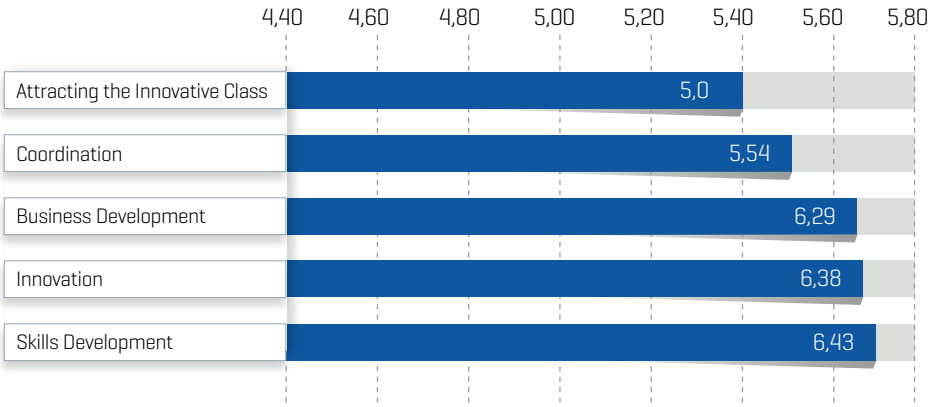
> *The areas of activity that are suggested for innovation normally conflict with the areas of activity of TTOs. However, since there is no TTO actively doing business in Manisa, the works of the IC in this field do not pose a risk.*

4.2.1. PRIORITIES OF THE INNOVATION CENTER

The participants' opinions on the potential priorities of the innovation center are given in the Graph 5.

According to the participants, the primary topics to be prioritized were skills development with 6.43 points and innovation with 6.38 points out of 7. These are followed by business development, coordination and attracting the innovative class.

Graph 5 **Topics to Be Prioritized by the Manisa OIZ IC According to the Participants**



4.2.1.1. Skills Development

Skills development is one the topics that intersect the areas of activity of various institutions.

> *We are having a hard time finding qualified people. They need to receive training on top of graduating from a university. We, as an institution, sent some of our employees to Istanbul to get the necessary training. There are also problems in the training provided in Manisa. Companies like us are supported by external institutions for a lot of matters.*

The Ministry of Education, the university, and the occupational high school located within the OIZ are the main human resource providers for Manisa.

> *The technical training of operators is a huge challenge. We lack qualified molders and CNC operators. Alumni of these fields do not prefer these jobs. They think that working minimum wage is a better option.*

TUBITAK, KOSGEB and the Development Agency are the organizations that work for the skills and abilities of companies. In the developed regions, these are supported by chambers and commodity exchanges. In the interviews, industrialists especially emphasized that skills development is one of the most important needs.

> *For the Manisa OIZ, digitalization should certainly be included in the product and production process. Because if we want our OIZ to compete with the ones abroad, our companies should have digital technologies within their infrastructures as well as design and product development tools that work in conjunction with thes technologies.*

When the structure of the Manisa OIZ and the positions of companies are considered, it is seen that mostly the motives of the productivity economy prevail, and in the OIZ with around 32 R&D centers, some of the companies that have the potential to be an R&D center work towards innovation economy. Based on these observations, considering that the industry is just embarking on its transformation journey, it seems normal that skills development activities are prioritized.

4.2.1.2. Innovation

The industry in Manisa is currently in the phase of understanding the importance of R&D and innovation. As mentioned above, around 35-40 companies in the Manisa OIZ are trying to make progress in terms of R&D.

On the other hand, the characteristic feature of the companies in the region is that they do contract manufacturing for large automotive, white appliance and air conditioning sectors. While these companies have to work for lower profit margins every day, they also struggle to meet the innovation needs of the main company. Innovation gains prominence within this context.

> *If we don't change something, this place is going to last only 5 years. We need to keep up with transformation. Even cars used to have the same body for 20 years, but now, you cannot use the same body for more than 5 years. We have to change, we have to keep up the pace. If you don't want to do that, you can keep doing business like a traditional craftsman.*

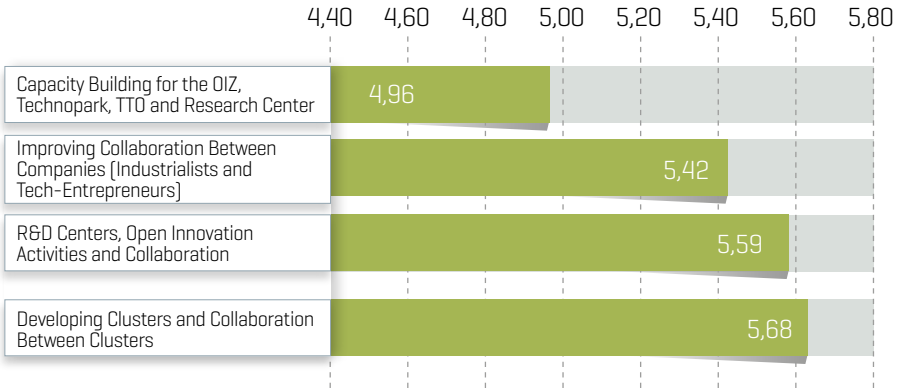
Innovation includes such topics as joint R&D ventures, technology assessment and valuation, commercialization, strategy development and mapping, access to platforms, and technology road mapping.

> *Digitalization is of great importance. We need to transfer the companies in the OIZ to the computer environment. Most of the companies still do business with pen & paper. Companies need to digitalize, simplify their business, improve their competitive aspects, and strengthen their innovation capabilities to generate new business ideas. Most of the companies in the OIZ, including us, are not able to produce new ideas. Companies producing wheel rims try to make more rims and increase productivity even more.*

4.2.1.3. Business Development

In the examinations carried out in Manisa, it was seen that the companies in the OIZ were quite interested in new job and collaboration opportunities. In this context, the participants' opinions on potential focus areas for new collaboration opportunities is given in the Graph 6.

Graph 6 **Activities to Be Prioritized by the Manisa OIZ IC According to the Participants**



Developing clusters and collaboration between them is considered as the top collaboration area with the highest priority with an average score of 5.7. This is followed by collaboration between R&D centers (5.6) and collaboration between companies (5.4).

> *A common goal should be set. For example, electric vehicles and automatic systems are among the areas that are open to development in today's world. Another development area today is the defense industry. Either or both of these two areas should be chosen for a project. Feasibility studies for these projects should be accurate, and a vision should be set. In this direction, the division of labor should be made among the companies.*

There is already an automotive supply industry cluster in Manisa. It was also seen that there was a potential of clustering in electronics, and Vestel's presence in Manisa had several advantages in this context. Therefore, it is considered that the IC can be useful in terms of forming new clusters and improving the current

improving the current automotive cluster.

> *We are trying to keep up with every project. Sometimes, we have files open in front of us for 10 different projects, but we try to do our best. With all these going on, we don't have the time to ask the university to do something for us. We wish that, from time to time, universities can organize an event to bring us all together. Or this can be done for the top 250 or 500 companies. I think that an event to be organized to gather companies around Turkey for 2-3 days can help us industrialists get acquainted with one another, with cluster works and joint work. If nothing else, this can give us the opportunity to get to know each other.*

The second topic that got a high score from the participants is the development of open innovation activities of R&D centers and improving collaboration between these centers. R&D centers are companies that carry out R&D activities actively in Turkey and conduct projects in collaboration with universities. The working group established by companies with an R&D center in Manisa provides the basis needed to improve these activities. It was seen that the Innovation Center could play an active role in introducing potential areas of business to be developed with the ideas and outputs of these companies. The benefits of collaboration between companies, especially between industrialists and technology-based enterprises, were emphasized. de sanayici- Attaching special importance to this collaboration can have benefits for both solving innovation and R&D problems of the industry and commercializing the products and services provided by technology-based enterprises.

> *Everyone wants to keep the current situation as is, they do business in the same way as they were doing 10 or 11 years ago. For example, the Vestel contractors do whatever Vestel wants. But the profit shares decrease. To pace up innovation, startups should certainly be included in the system, and an inventory of works done in the technoparks around should be introduced to map accordingly. For mechanics, welding and hydraulics production should be accessed to improve collaboration.*

It is considered that the activities that got the highest scores are mostly similar to the areas of activity of the Development Agency, technoparks and TTOs, and there is a possibility of conflict between these areas of activity. To eliminate such risks, it would be useful to have the related organizations in the executive or advisory board of the Innovation Center.

4.2.1.4 Coordination

Coordination was considered as the 4th priority for the actors in Manisa. By

ensuring the coordination between the MRIS actors of the Innovation Center, the quality of corporate activities can be increased.

These activities will be followed by skills development, innovation and business development activities. The topic of coordination intersects with the area of activity of the Development Agency in general. At this point, the way of defining coordination and identifying the parties and activities regarding coordination gain importance.

However, since the Manisa ecosystem is smaller than those of Ankara and Istanbul, establishing coordination between institutions should be easier. Therefore, it was considered that this role could be played by the current institutions.

4.2.1.5. Attracting the Innovative Class to the Region

Attracting the innovative class to the region was not considered by the participants as one of the priorities for the Manisa IC. While this matter is seen as important, the geographical proximity of the Manisa OIZ to Izmir and Manisa's potential to easily attract white-collar employees from Izmir affected this evaluation of the participants.

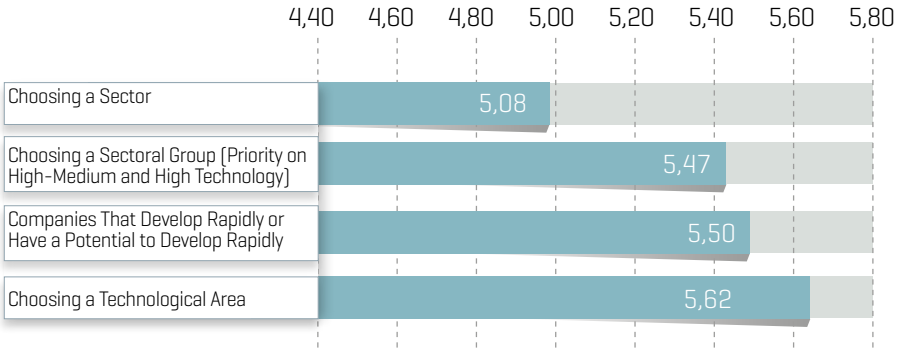
Today, 90 percent of the white-collar employees working in Manisa companies come from Izmir.

4.2.1.6. Focus Sector and Areas

The evaluations from the participants on the sector, sectoral group, technological area and priority given to rapidly developing companies in the areas of activity of the Manisa OIZ IC are given in Graph 7.

The participants showed the greatest interest in choosing a technological area (5.6). Focusing on the companies that develop rapidly or have a potential to develop rapidly (5.50) as well as focusing on choosing a sectoral group (5.47) were considered important by the participants.

Graph 7 **Primary Focus Areas for the MOIZ IC According to the Participants**



4.2.2. STRUCTURE OF THE INNOVATION CENTER

Manisa is ranked as 17th in Turkey in terms of GDP and 23rd in terms of socio-economic development. It is still in the process of becoming an industrial city thanks to its proximity to Izmir and harbors nearby. Improving the relationship especially with Izmir in general as well as with other cities for R&D and innovation has become increasingly important.

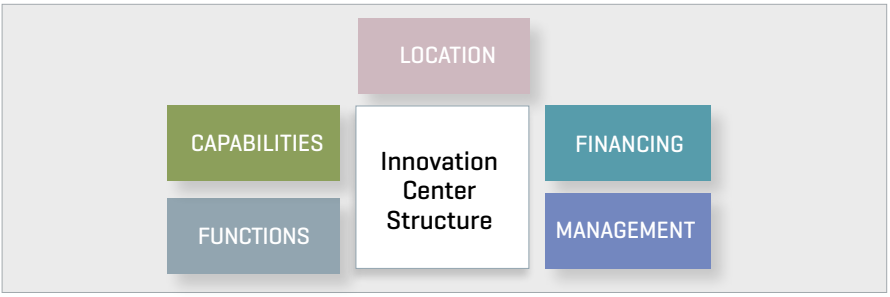
> *Collecting macro and micro trends in global innovation strategies from the right resource and documents and transmitting this philosophy to companies and R&D executives in the region again and again should be the primary motto of the Innovation Center.*

Therefore, the structure and functions of the Manisa OIZ IC that are planned to be established should be projected within this context. In addition, the activities of the IC for companies within the OIZ need to be associated with larger centers.

The participants were also asked for their opinions on the structure and components of the IC to operate on the prioritized topics and areas they previously determined.

The common opinion on the structure of the center is that the IC will focus completely on the industry and primarily on the needs of the companies in the OIZ.

Figure 5 Innovation Center Structure



4.2.2.1. Functions

Based on the priorities the participants determined in the previous section, the order of priority for the functions of the Innovation Center were skill development, innovation, business development and coordination.

These functions, which are transitional and nested within one another complement each other while they sometimes diversify in some activities and processes.

In addition, instead of expecting the Manisa OIZ IC to fulfill all the functions by itself, some of the activities can be conducted through the institutions specialized in the related field. The center will also be able to create a platform within the regional innovation system and enable capabilities and opportunities of the related

interfaces in areas where they have influence, which will enable the center to contribute to establishing effective coordination.

Therefore, a structuring that can hold the potential to benefit from the services of an active interface in Istanbul or Ankara, not just in Manisa, is needed.

In Figure 5, the general functions of the Manisa OIZ IC and the activities required by the Manisa OIZ and the companies within the OIZ are summarized in accordance with the participants' opinions.

Two subtopics were chosen for each function. It is considered a suitable approach for the MOIZ IC to choose one or two of these topics and turn them into a pilot project.

Figure 6 Functions and Primary Activities of Innovation Centers

1 Skills Development	2 Innovation	3 Business Development	4 Coordination
Creating networks and building trust	Improving R&D, innovation, entrepreneurship and digitalization capacity of companies	Developing collaboration between clusters, R&D centers and other companies	Providing access to Izmir, developed cities and the international arena
Improving the professional qualification and capabilities of R&D employees in companies	Enhancing the corporate and innovative capacity of the OIZ	Improving the collaboration between industry and startups for commercialization	Simplifying access to platforms and interfaces

1-Skills Development

The innovation policies adopted by public enterprises in recent years led to significant developments in R&D and innovation in the Manisa industry. While outputs such as the increase in the number of R&D centers and collaboration between the university and the industry, as well as the active role of the technopark can be observed, the industry in Manisa still conducts its activities mainly based on the productivity economy.

With the impact of this situation and various reasons like outstanding shortages especially in terms of intermediate staff, blue-collar workers quitting their jobs in seasons of agricultural activities, and underdevelopment of industrial work culture, the participants regarded skills development as the issue with the highest priority for the Manisa OIZ IC.

> *Our biggest problem is employment. We don't have qualified personnel in Manisa. But we have lots of key industries. We, SMEs, are around as well, but our primary problem is that we don't get the chance to employ an adequate number of employees. Even if we train our employees, they don't stay for the long term. They tend to move to the key industries immediately.*

Skill development activities and trust issues related to these can affect the success of all other functions and activities. Within this context, two basic activities were determined:

(i) Improving professional qualification and capabilities of R&D employees,

(ii) Building new network relationships and trust between actors by developing the networking capabilities of actors

> *If you want to establish an IC and decide to organize a training program for R&D engineers, the R&D executives working in the OIZ in various fields will undertake the implementation of this program. In this way, you can support the development of these people without outsourcing.*

Trust is an issue that increases the quality and impact of the works carried out while reducing the cost of doing business. It is important for the IC to continuously carry out activities to promote trust and to support such activities. Within this framework, various mechanisms need to be developed to enhance interaction between actors. In order for the collaboration and relationships between the parties to improve, they need to interact on a formal and informal level and talk to one another. In addition, skills like strengthening network relationships, competing while collaborating, negotiation based on profit instead of position, and effective communication, which enrich the social capital and enhance networking capabilities, will form an appropriate basis for the actors in the ecosystem to become qualified and for the network relationships both within and outside the region to be developed. Once industrialists, startups, research center executives, TTOs, technoparks and OIZs gather to interact and start to understand one other, this can evolve into various collaborative operations and relationships.

> *We want companies to come together and design projects together while the IC helps them. But we need relationship of trust before all that. I am talking about the trust relationship being established right at the beginning. The company or people that I will do business with will know the most confidential parts of my business. They will work with me on that specific project. Therefore, they should not transfer the innovative idea they get from here to any other company. That's why trust is fundamental.*

Another important aspect for skills development is to improve the skills of employees. Within the scope of the study, an insufficient number of professional employees and low competency level were among the problems that were consistently emphasized in the industry. Firstly, there is a need to develop programs that focus on professional areas where people defined as intermediate staff are required and R&D employees. In this context, it was thought that professional competency in the Manisa OIZ could be increased by organizing two separate programs.

In recent years, the number of white-collar employees is increasing, contrary to blue-collar workers. Thanks to automation, you can do a lot more while keeping the number of employees the same or increasing the number just a little. Expanding our capacity and capabilities especially in engineering and R&D is rather important for us to improve our export activities. Customers demand the products from us, the technology that we develop here. And we can achieve this only with white-collar employees.

2-Innovation

In the examinations and observations undertaken within the Manisa OIZ, it was seen that no adequate level of awareness, willingness, or capacity was achieved in terms of R&D, innovation, digitalization and entrepreneurship, except for some developed and relatively corporate companies. In addition, it was understood that there is no sufficient information or capability to access government aid. Within this scope, expanding the capacity of companies in matters such as the innovation economy and innovation-based competition with the help of various training and consultancy activities was considered among the basic needs.

Manisa needs to increase its added value. There is already a culture of commerce and business. There are large companies. With all these at hand, we will try to improve technology, research and innovation. The center should give the priority to R&D.

In this framework, a few points stand out among innovation activities.

(i) To expand the capacities of companies in R&D, innovation, entrepreneurship and digitalization. In this scope, (a) To measure innovation capacities of companies and create a road map for them (b) To improve companies' ability to access aid (c) To help companies with the potential to become an R&D center turn into one.

(ii) To expand the innovation capacity of the Manisa OIZ. In this direction, to help the employees in the OIZ adopt innovative approaches by making it easier for them to provide better services to the companies they serve and to create an innovative capacity in the OIZ to guide the companies in this context, primarily in areas of priority such as management processes of the OIZ and company selection criteria.

Expanding the awareness and capacity of industrialists and companies in R&D, innovation, entrepreneurship and digitalization is of great importance for potential collaboration to be established. In order for the relationships between the industry, universities, research centers, technology-based companies and startups to be improved, the innovation competency of the companies and their owners needs to be enhanced.

While a needs analysis needs to be carried out at company level, and a road map needs to be prepared accordingly, preparing the companies for promotions and aid for R&D and innovation and guiding them in this direction will fill a large gap in this context. There is a need for redirecting the companies to government aid for their needs, and providing consultancy to write projects, organize project

teams, and establish relationships with public enterprises.

In this way, opportunities were considered for companies to have financing for their activities more easily with the aid they receive, and to improve their organizational culture as one of the externalities of these activities.

> *This structure may organize TUBITAK projects, establish a research platform, and gather some companies here to join their technologies. It should have goals like these.*

In addition, during the visits made in the region, it was seen that some companies had the capacity to become R&D centers. Within this scope, as it is stated above, turning the companies with adequate potential into R&D centers can help innovation awareness and culture to be adopted within the company more rapidly.

3-Business Development

According to the participants, business development is the third topic of priority, and the participants' opinions primarily focus on two areas of activity:

(i) To map and to develop joint R&D projects as a result of collaboration between clusters and R&D centers with the help of commercialization activities for the industry, and

(ii) To develop collaboration projects between companies

> *People usually want to collaborate, but they also do not want to lose the know-how in their hands. Most of my suppliers also work for our competitor. Therefore, it is possible that my improvement reaches my competitor before it reaches me. We have some deficiencies in our working culture, like nondisclosure agreements. These are personal precautions, but they need to be improved. I can obtain information from my suppliers. If they give me information, I assume they might communicate information about me to others.*

In this field, especially commercialization of R&D and innovation projects, which are developed by the industrialists themselves or in collaboration with technology-based companies/ entrepreneurs/academy, gain importance. In this direction, innovative projects need to be developed based on a topic or need, with the cooperation of large industrial companies and startups. In this process, the possibility of working towards the problems of the industry in Manisa by accessing resources primarily in Manisa and Izmir, and later on in Istanbul, Ankara and other cities is evaluated.

> *Companies take part in innovation, everyone has an idea on a product. But producing the product requires money, and creating it may take a lifetime. Hence, we need to improve the partnership and cooperation culture.*

While being able to solve a problem together with technology-based entrepreneurs as per an industrial company's request is seen as

an important phase, turning the developed solution or product into something that can be marketed in the international arena apart from the customer company is considered as significant potential.

However, companies with foreign capital may impose some restrictions on production facilities or supplier companies in Manisa while establishing collaborations. There are challenges both in terms of critical technologies and the level of activities that can be carried out in cooperation with various companies.

> *We are a foreign capital company. Even R&D, the most advanced and the most open-minded brain of foreign capital in the factory, has a commercial concern to keep some information in the center or to sell it to external parties. The party having such concerns is also a foreign capital company. Therefore, there might be some restrictions on collaborations that we talk about. We may not be super relaxed and share all our issues with everyone because we have a central administration abroad that we report to. In foreign capital companies like us, people might not be that transparent.*

Meetings for industrialists and startups should be organized focusing on a certain sector or technology. In the selected sectoral or technological field, solving specific problems of the industry by working on the background of events with a result-oriented approach, covering the innovations to be brought to the industry in the event, inviting tech-entrepreneurs to this field, and organizing the event in accordance with a specific system can strengthen collaboration between small and large companies.

> *Startups are great ideas. They work pretty well in theory, but why don't they work in practice? I participated in a startup event at Tofas three weeks ago. In this event at Tofas, there were problems even in the investments to be made for the startups. Therefore, although they organized this event, the startups didn't receive the investment they needed in the end. Companies didn't want to invest in them since it would take long for their investments to show a return. But this event helped in a way. Tofas brought startups and suppliers together in this event. We listened to them all day, we got the opportunity to do networking. We had the chance to talk to them. Now, we are talking about doing business with one of them. Tofas created an environment to help them solve their problems as the mediator of this event.*

The main problems here are caused by two different worlds unfamiliar with each other, failure to develop a common language, and incoordination between expectations. Especially if the industry is not corporate or large-scaled enough, such problems become more evident. In addition, some think that applications developed for commercialization are not enough to solve the problems in the field. Therefore, the requirements need to be identified clearly, and the

responsibilities of the parties need to be defined.

> *It is not an easy thing to establish sectoral collaboration between the industry and startups. For example, there are pretty critical know-hows in the sector regarding gas burning devices like ours. A startup coming in from outside the sector cannot develop something in this field without first gaining experience in the industry. Secondly, technology-based entrepreneurs that we talk about need a great deal of time and effort to establish and run the system. Large companies find it hard to take risks in such situations. They think about the damage and loss of prestige that they can suffer in the case of wrong product introduction.*

Another point to consider in this regard is that R&D centers, clusters and/or other companies that are not R&D centers should be able to develop projects collaboratively. In the studies carried out in Manisa, it was observed that 32 R&D centers established a joint platform to gather around various agenda items, which increased the interaction between them.

> *The R&D center platform is an important step also in terms of interaction with other R&D centers. You can interact with other companies that engage in similar activities or that you can collaborate with. Giving them the opportunity to meet R&D companies is another plus. If you can think of it as a platform that can direct the right company to the right spot when a project is developed, as we talked about before, instead of focusing on the question whether a project can be developed there, you can see that this platform will be useful. But I think that it is not likely to generate a project from that platform at this point. Instead of developing a joint project in the R&D Platform, it is more realistic that a center be established for this purpose to develop a project based on a goal.*

This platform that primarily focuses on bureaucratic problems regarding the Ministry of Industry and Technology has the potential to develop project ideas and strengthen collaboration between sectors in the following periods. Therefore, it is seen as possible that the Manisa OIZ IC can help organize joint activities with various developments by improving the capabilities of this platform at hand.

The reputation and brand value of the Manisa OIZ will be extremely critical for a successful cluster. In this way, not only can the activities carried out by the clusters be made sustainable, but also a driving force can be created to introduce products and market them especially in international markets.

> *There is a culture of branching out in the automotive sector. There are different people that work on different parts like bumpers, gloves, right side doors, or left side doors. At this point, the OIZ should prepare the road map, create the clusters, and negotiate with international companies. It should be able to say that we have a system with these features and market the product as a whole.*

4- Coordination
Coordination activities will lay the groundwork for innovation, collaboration and skills development activities and enable industrialists and technology-based entrepreneurs to access the information they need first hand.

The industry in Manisa should especially access information and data sets it needs in various fields more easily. Explicit and implicit information in the Manisa regional innovation system and access to platforms and interfaces in Turkey and in the international arena will enable the provision of the information that the industry and technology-based entrepreneurs need.

Expanding the collaboration between university, industry and public enterprises together with the Zafer Development Agency, gaining command on the whole skill set of the region as a regional TTO, and simplifying access for companies to the platforms at national and international level were considered the fourth priority of the Manisa OIZ IC.

4.2.2.2. Management

There are alternatives for the legal status of the Manisa OIZ IC, such as a corporation, association, foundation or cooperative. While most of the participants thought that incorporation was a better option, it was also considered that a cooperative structure, which has recently become more common in Turkey, could be implemented, to establish a cooperative of which the companies in the Manisa OIZ could be partners.

> *The OIZ is in touch with all of the companies here. It is aware of the innovations in these companies, and these companies have a share in the management of the OIZ. The companies are in this organization in the positions of executives or board chairmen. The Manisa OIZ can make great contributions to the formation of a collaboration culture between these companies.*

The Manisa OIZ already has a corporate structure and it also leads a foundation structure. Compared to companies, structuring as a cooperative that has a potential to develop and enable international financing options and specific government privileges can be considered as a more transparent alternative in terms of governance.

> *The TTO, technopark and university should be included as well. But they should be incorporated into the system, rather than being represented on the board. The OIZ should undertake this task along with its financing.*

It is recommended that the management of Manisa OIZ IC be based on performance and have a structure that will enable the implementation of a premiums system based on reaching determined

goals. In this way, a sense of motivation can be created, and the level of success can be raised. In the model to be established in this direction, an organizational structure should be introduced to enable the executives of the center to implement performance programs based on tangible goals that they will determine.

> *The university should be on the advisory board. Their breaking mechanism might not work here, but we can use the motivation it provides. If the university takes part in the management and uses its breaking mechanism, this may block everything. Giving the senior responsibility to the technopark instead of the rector can be more beneficial and functional.*

The partnership structure is one of the most debated topics. Some of the participants emphasized the challenges of doing business with lots of partners and suggested specific models that do not exclude the stakeholders by including them in such structures as advisory boards. Within this framework, it was emphasized that a more agile decision-making mechanism can be achieved if the public enterprises and universities are included in the system within advisory boards instead of partnerships.

Like other OIZ models, although it was considered at first glance that the management of the Manisa OIZ IC by industrialists could be rather effective, disagreements specific to Manisa and several groups' desire to rule over the IC may cause a variety of problems and separations. Therefore, it would be wise to decide on the structure of the center after a detailed examination of the company and cooperative practices under the responsibility of the current OIZ management. However, before making such decisions, it will be beneficial to observe a pilot implementation and its results and complete the structuring before the transition to implementation.

4.2.2.3. Capabilities

Another factor that will affect the success of the Manisa OIZ IC is the skills and capabilities of the center. Within this scope, the organizational structure of the center, working environment, as well as the training, experience and skills of employees are among the important criteria that will determine the success of the center. For these reasons, considering the areas and fields of activities above, human resources planning should be performed for the IC.

> *Everything will be shaped by a relational manager. This manager will know where to find anything, have a strong communication with professors, and be on good terms with the public.*

Considering that the Manisa OIZ IC will assume the functions of skills development, innovation, collaboration and coordination in that order of the priority, it is understood that technical competency, experience, and social capital capacities will gain importance. In this direction, the skill set that the IC will have should

know the public, the university, entrepreneurs, and industry well, have experience and knowledge about employment, training, consultancy, R&D and innovation and interfaces, and hold the social capital needed to make all of these elements functional.

> *If you ask me how the profile should be, I would say it needs to have the highest level of academic structure and competence while including the business development competences at the same time.*

On the other hand, alongside full-time employees, consultants and mentors are needed in the Manisa OIZ IC, who are intellectuals, have experience in business, industrialism or entrepreneurship or have a background of managing various departments of important organizations, and can give confidence to the market. Such people can be positioned in a way that they can guide potential business opportunities, lead the way, and simplify the business by keeping respect between parties, and thus play an important role in the success of collaborations.

A remuneration policy that is suitable for the skill set of employees to work in the Manisa OIZ IC and competitive in the market conditions needs to be defined. Especially in the establishment process, a low turnover rate is of great importance. Therefore, opportunities and conditions for these employees stand out both in the selection and employment period. For example, a premiums system based on performance, in addition to the fixed wage, can be considered among the factors that can motivate employees.

Avoiding unnecessary hierarchy among employees in the center and offering employees an initiative that they can commit themselves to are other factors emphasized by the participants.

Conditions such as the working environment, working systematics, business culture, and wages, which will increase working motivation, stand out when the qualifications of employees to work in this center are considered.

4.2.2.4. Financing

Finding financial resources will be effective for Manisa OIZ IC to provide services in an active and sustainable way. In addition to the office, personnel and other operational expenses among the important expenditures of the center, financing will be needed to conduct the activities related to the prioritized matters.

The IC will be supported financially by the Ministry of Industry and Technology throughout the project. For now, this support will cover the wage of the IC director for the project term and expenses of the selected pilot project implementation. On the other hand, the OIZ will cover other personnel and operational expenses of the IC and provide an office and place for activities of the center, as well as defray costs for training and counselling and mentoring requirements of OIZs and participating companies. At the end of the entire project implementation, the Ministry and the OIZ will have consumed 50 per cent of their resources. In the implementation process, costs are covered in a flexible and consensual

manner, provided that the above-mentioned principle of equality is respected.

While the basic principle is to meet the financing requirements of Manisa OIZ IC with the activities of the IC and maintain sustainability after the pilot project, this needs to be subsidized for a defined period.

In this framework, a good portion of the participants stated that the Manisa OIZ IC could be supported jointly by public funding and the OIZ until the center would become self-sufficient like other similar centers around the world that received aid in the beginning. Therefore, the Manisa OIZ IC will need some time to complete its institutional structuring, start some of its activities, and make an appearance in Manisa over time. It was emphasized that the center could generate a considerable amount of revenue afterward and use this revenue for its activities. Until then, it is considered that the public sector could fund the center's activities with the contribution of the private sector. katkısıyla birlikte fonlayabileceği düşünülmektedir.

4.2.2.5. Location

The location and place arrangement of Manisa OIZ IC is one of the most important subjects where it will carry out its activities, can directly affect the quality, direction and effectiveness of the activities.

While geographical proximity to companies and the OIZ management, especially during the establishment phase, is regarded as an advantage, locating Manisa OIZ IC within the OIZ building can help save on rental expenses. For these reasons, it is deemed appropriate to locate the IC in the OIZ management building during the pilot project implementations, and for the medium term, to determine a location in accordance with the function it will have within the complex to be established, and with other structures including the technopark, incubation center, and congress center will be established by the OIZ.

While the location of the Manisa OIZ IC is being planned, it should be handled harmoniously with the function of its physical environment and the innovation center approach. Preferably, the IC can be located with an enjoyable location where it can perform the activities of coordination, collaboration, innovation, and skills development easily, which will be easily accessible, close to other social services and places, and promote the cooperation between parties and may enhance interactions. It can be possible to create effective social capital from of the human workforce that comes together in this way.

4.3. End-of-Chapter Review

In this section, a needs analysis was performed on the Manisa Organized Industry Zone Innovation Center that is planned to be established. In this analysis, 36 in-depth interviews were held.

By evaluating these interviews, the aim was to identify findings on the purpose, functions, organization, location, and goals of the Manisa OIZ.

The findings of the needs analysis are summarized below.

- The Manisa Regional Innovation System (MRIS) currently conducts its activities within the framework of the innovation economy. However, 32 companies established their R&D centers, and some of them started their innovation activities with several TUBITAK projects. Especially with the impact created by Vestel and other large companies, contractors and suppliers at the lower part of the value chain continue their efforts and pursuit for the sake of innovation, design, and quality development.

- The overall performance of the MRIS, which the participants tried to estimate, is at the medium level with a score of 4.31 out of 7.00. The lowest score was given to local administrations, clusters, and KOSGEB while the highest scores belonged to Zafer Development Agency, Manisa OIZ, and Manisa Technopark respectively. The fact that the highest score given is 5.5 out of 7 shows the need to improve the corporate capacity and business skills of the actors in the ecosystem.

- The primary fields that the participants attached the greatest importance to are skills development and innovation. These are followed by business development and coordination.

Since the Manisa OIZ operates within the productivity economy, the participants determined the primary fields for the Manisa OIZ IC as skills development and innovation.

- In terms of skills development, two activities were emphasized. The first skill is to develop the network abilities and sense of trust of the actors, which will enable the environment that will strengthen the coordination function of the planned Manisa OIZ IC through the relevant skills. The second activity is to improve the level of capabilities and skills of the intermediate staff working in the industrial zone and R&D personnel.

- In terms of innovation, it was seen as beneficial to expand the R&D, innovation, entrepreneurship, and digitalization capacity of the industry, to provide consultancy to companies for this purpose, and to prepare needs analyses and road maps. In addition, simplifying access to government aid for the companies in the Manisa OIZ, directing the companies to initial R&D aid in particular, carrying out activities on writing projects to enable such aid, and raising the awareness level of company employees were identified as the primary needs. It was also projected that the number of R&D centers in the Manisa OIZ could be increased, and the companies with this potential could be provided with the necessary training and consultancy.

- For business development activities, joint project development and implementation were focused on. It was considered that various projects could be developed with the companies that are not R&D centers, in addition to the ones to be developed with the collaboration of clusters and R&D centers. The most important activities in this field are establishing a platform where industrialists and technology-based entrepreneurs come together and developing joint projects based on specific needs. R&D centers play an especially important role in this respect. It is considered that the current platform that is established between R&D centers is rather suitable and improvable for business development.

- For coordination, it was thought to establish a mechanism that would have the necessary information on Manisa, Izmir, and other cities in Turkey, as well as in the international arena, to give the actors in the MRIS the ability to access the information needed and provide industrialists with this information when needed.

- Partnership is another subject that needs to be considered thoroughly. In this regard, opinions supporting the idea of establishing an advisory board, in addition to an independent management structure in the Manisa OIZ IC gained importance. The organization of the Manisa OIZ IC in a corporation status is another subject that was considered as important. It was concluded that the alternatives of establishing the center as a cooperative or corporation could be considered after the pilot project to be implemented on this matter.

- It was seen as necessary for the Manisa OIZ IC to have human resources with the capabilities required to fulfill its functions. A mentor pool needs to be created to include more experienced people who may provide guidance in the projects in addition to the full-time employees.

- The projection suggesting that the Manisa OIZ IC will be able to cover all of its expenses with its own revenue is what the IC is predicated upon. The structure is planned to be established with government aid and financing from the MOIZ and it is expected to be able to finance itself in the future.

- It is projected that the IC may be located in the management building of the MOIZ while the place where it will conduct its activities is established, and later on, may be moved into a location where it will be with other structures planned to be established within the MOIZ like the incubation center, technopark, common lab or evaluation center depending on its performance and success.

In conclusion, the current status analysis, information obtained through the workshop, and needs identified through this analysis formed an important basis for the preparation of an eligible strategy and road map.

5 STRATEGY AND ROAD MAP

Manisa OIZ Occupational and Technical Anatolian High School (MOSTEM) Sports Facility

The Strategy and Road Map (SRM) includes the establishment process of the Manisa OIZ IC and is given in this chapter. The SRM is prepared based on the studies of "Current Status Assessment", "Manisa OIZ IC Workshop" and "Needs Analysis".

The SRM focuses on the primary needs of the companies in the Manisa OIZ considering the functions in the establishment and development processes of the IC, as well as the capacity and resources estimated. For this purpose, first, a SWOT analysis was conducted, and then, an SRM that includes the vision, purpose, objective, strategy, and actions was prepared based on the SWOT analysis.
In the preparation process of the SRM, the term was determined as short (1 to 2 years) and medium-long (2 to 5 years). The short term covers the priorities and actions that form a framework for the "Pilot Implementation Project" to be prepared in accordance with the SRM and the establishment process of the IC. In the medium-long term, it is planned to turn the IC into an innovation ecosystem interface that the companies in the Manisa OIZ trust and respect as well as an organization that can develop approaches and projects to offer a solution for the needs of the companies.

5.1. Background for the Strategy and Road Map

The current status assessment, needs analysis, and the findings of the workshop organized for the establishment of an IC in Manisa are the guiding factors for the SRM.

A summary of the findings identified in the current status assessment is given below.

- Manisa is ranked 23rd Turkey in terms of socio-economic development. It ranks higher in terms of economic activity, employment, competitiveness, and innovative capacity while its rank is lower in terms of quality of life, health, and educational conditions.

- When various factors such as the works carried out by the Technocity and TTO within the university, increasing activities conducted to improve collaboration between the industry and the university, the financial support provided and projects conducted by the Development Agency, increase in the number of R&D centers to 32, and the development observed in the clustering activities are considered together, it can be said that significant developments are observed in innovation for Manisa and for the Manisa OIZ that hold 90% of the industrial potential.

- Manisa OIZ has won the hearts of industrialists not only with its infrastructure but also with the services it provides to industrialists, and it is among a few leading OIZs in Turkey in terms of services for the productivity economy. However, the tools and actors of the regional innovation system like TTOs, Technopark, Business Incubator, Common Use and Open Innovation

Areas (Common R&D Center, R&D Laboratory, Test and Analysis Lab) do not exist in the OIZ.

The rapidly growing companies in Manisa have an increasing share in Turkey and the city. Fabricated metal products, food, machinery, equipment, and electrical equipment sectors stand out among the rapidly growing companies.

■ It is not possible to say that competition strategies based on R&D and innovation have become widespread among the companies in Manisa and the city's economy. Although it is clear that the number of enterprises, sales, and profitability have increased and productivity level of companies are raised, leading people to consider that this is a potential for transition to the innovation economy, it is hard to say that this potential has been turned into R&D and innovation initiatives at an adequate level.

■ While the changes that the economy in Manisa undergoes are generally disadvantageous to the companies in high-technology sectors and advantageous to the medium-high, medium-low and low-technology sectors, it can be observed that the R&D expenses in high-technology sectors decreased, the exports in medium-high-technology sectors increased as opposed to decreasing kilogram value, and the kilogram value of exports increased further due to higher increases in R&D expenses in medium-low- and low-technology sectors compared to other technology groups.

■ When this tendency in the production structure in Manisa and rapid expansion in other sectors are considered, it can be said that Vestel loses its influence in the industrialization process of Manisa relatively while it keeps growing at the company scale, and the companies in medium-low- and low-technology sectors especially make more investments that will raise their technological level and contribute to innovation for the purpose of increasing productivity under competitive pressure.

■ When contract manufacturing, a common practice in Manisa, is taken into account, these findings make it possible to assert the following hypotheses about company strategies that can affect the subjects and methods of working of the IC:

- As a global trend, the share of the service sector components like software within product costs has been increasing in a way that is unfavorable to the material components. On the other hand, rapid transformation in products occurs in parallel with technological development and product diversity. Digitalization has started to affect every field of production and economy. A majority of the companies in Manisa have difficulty in making progress in parallel with these developments and try to respond to the competitive pressure caused by other companies in contract manufacturing and signals coming from the upper parts of the value chains in general.
- R&D and innovation are integrated into each company's strategy in a different way. Some companies spend more on R&D to gain competitive power while others adopt a competitive strategy with a focus on productivity and cost/price.

Apart from large manufacturers like Vestel and Bosch, three groups of companies can be referred to in this hypothesis.

- The first group includes the companies that moved from a competitive strategy based on the low-cost labor to a productivity-based competitive strategy and currently follow this strategy. Such companies mainly do contract manufacturing. The demand for increasing productivity in product and production organization is forwarded to these companies by the upper divisions through the supply chain. It can be said that such companies prefer the profit they make by increasing productivity with the help of the know-how of the parent company over the expected gain to be achieved undertaking a risk in return for R&D and innovation.

- The second group follows a competitive strategy based on productivity and mainly do contract manufacturing just like the first group. It allocates resources for R&D and innovation and express, at least verbally, the fact that innovation is an important factor to increase the competitive power of the company and to help the business grow. It can be said that these companies derive their motivation and approach to innovation from the parent company outside Manisa. While parent companies around the world used to share only the risks caused by the labor force, financing, and market risks, now, with the changing production structure, they tend to share risks and advantages of R&D and innovation through open innovation systems. It can be considered that this situation supports the said innovation process.

- There are fewer companies in the third group compared to the first two groups, and these companies focus their competitive strategies on innovation. However, it can be said that innovation even in most of these companies depends on a limited understanding with a focus on government aid. Currently, there are no objectives such as following the trends in technology and demands, re-organizing the production pursuant to digitalization, and managing risks to position the company and its products according to the information like market signals.

Companies' tend towards a competitive strategy based on productivity and price, as well as to limit themselves within this strategy. This can weaken them in competition and obstruct their adaptation process at times when innovation and R&D activities gain more importance. Therefore, while there is a risk of large breakdowns in industries like the one in Manisa which are based on contract manufacturing, a new period has started in which companies that are able to keep up with the transformation process enable various opportunities.

The findings obtained as a result of the needs analysis are consistent with this, and support the current status assessment and are summarized below:

■ The Manisa Regional Innovation System (MRIS) conducts its activities within the framework of the productivity economy. Primarily with the impact created by Vestel and other large companies, contractors and suppliers at the lower links of the value chain continue to work in the pursuit of innovation, design, and quality development. Although the number of R&D centers and TUBITAK projects has increased, awareness of innovation and medium-long term perspective in company strategies is underdeveloped with a few exceptions.

■ MRIS actors' corporate capacity and capability to do business needs to be improved. The primary areas that are to be improved in this direction are skills development and innovation. These are followed by business development and coordination.

■ In terms of skills development, two activities were emphasized. The first activity is to develop the network abilities and sense of trust of the actors and to improve the level of capabilities and skills of the intermediate staff working in the industrial zone and R&D personnel. In terms of innovation, the industry's capacity for R&D, innovation, entrepreneurship, and digitalization need to be expanded.

■ In the short term, the focus was on joint project development and implementation for business development activities, which were considered a lesser priority. For coordination, it was projected to establish a mechanism that would have access to the information and commercial relationships in Manisa, Izmir, and other cities in Turkey as well as in the international arena and provide the beneficiaries with this information and relationships, which, as a result, could enable the actors in the MRIS ability to access the information and networking relationships that they need. In fact, it is considered that these functions can be implemented more actively with capacity expansion in both the IC and the MRIS.

The findings obtained in the workshop carried out for the Manisa OIZ IC are summarized below:

■ It was seen that the level of the Manisa OIZ's embracing this enterprise is rather high. The IC should work with the vision of "transforming industrialists in a competitive manner by spreading the culture of innovation and value creation". It was projected that the IC would complete its establishment process and establish good relations with stakeholders in the short term, and in the medium term, it would systemize and diversify its services by becoming professionalized. Among the opinions shared by the majority, the IC starting to generate its revenue sufficiently enough to keep it working without the need for financing aid from outside in the long term, employing a qualified working team including people in different specialties and functions with strong communication skills, and organizing in a corporate status are the ones to stand out.

■ The projection suggesting that the Manisa OIZ IC will be able to cover all of its expenses with its own revenue is what the IC is predicated upon. The structure is to be established with government aid and financing provided that the Manisa OIZ is expected to be able to finance itself in the long term.

- It is considered that the IC may be located in the management building of the MOIZ while the place where it will conduct its activities is established, and later on, may be moved into a location where it will be with other structures planned to be established within the MOIZ like an incubation center, technopark, common lab or evaluation center depending on its performance and success.

- It was projected that the center would operate as a supporting and complementary structure for the innovation ecosystem and in relation to and in communication with other actors within the innovation ecosystem rather than being a single structure.

- It was stated that it would be right for the center to focus on the fields such as design, robotic technologies, cloud technologies, digitalization, software, smart specialization, and clean technologies that intersect all sectors in the long term. It is considered that this approach can be put into practice in the medium-long term for the positioning of the Innovation Center. In the short term, it was stated that sectoral focus could help the center to show its benefits in a specific area and prove its impact.

- It was emphasized that it would be beneficial to consider the primary role of Manisa in production and Izmir in commerce and design together, and to improve interaction thanks to the IC's taking the complementary and supplementary parts between these two cities into account.

5.2. SWOT Analysis

The SWOT analysis is carried out on the IC that is planned to be established within the Manisa OIZ. The assessments performed for the IC, OIZ, and the city of Manisa have the aim of determining the possible functions of the IC and its contribution to the industry and understanding the strengths and weaknesses of the IC on this matter, as well as the surrounding conditions.

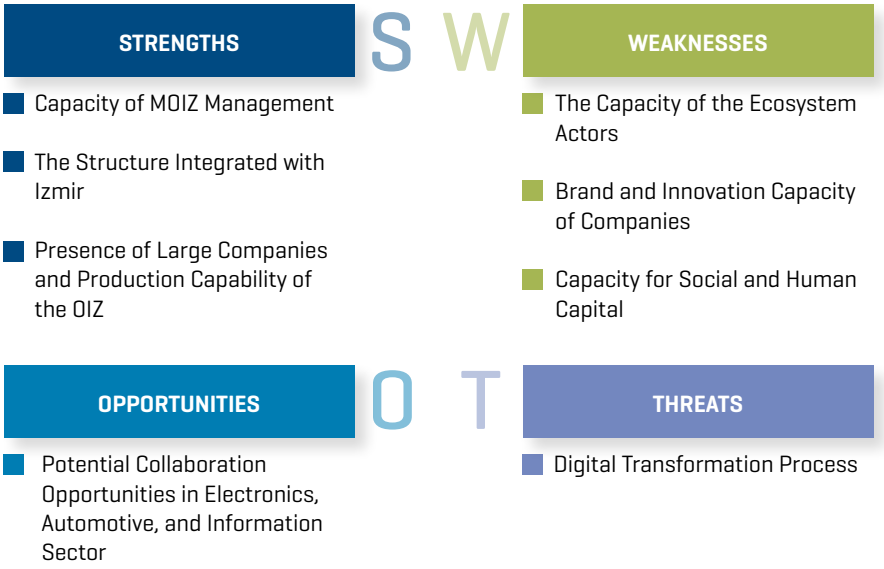
The two basic features of the SWOT analysis are taken into account in the assessments:

Relativity, simply refers to the fact that an assessment can vary depending on the reference point it is based on.

For example, a factor in Manisa may seem powerful under the conditions in Manisa or Turkey, but this factor may not be that powerful when compared to developed cities around the world. In this study, the aim is to develop strategies by focusing on a specific assessment depending on the impact (positive or negative) or scale (at the city, Turkey or global, or sector, if applicable) prevailing in the establishment of the IC and transformation of the industry in Manisa, and by paying regard to the comparative situation.

Transformability refers to the fact that weaknesses can turn into strengths, or, similarly, opportunities can turn into threats and vice versa. Transformability is used to plan the strategies that determine how we can turn our weaknesses into strengths or remove the threats with our strengths or by satisfying our vulnerable aspects.

Figure 7 **The SWOT Analysis Performed for the Manisa OIZ Innovation Center**



5.2.1. STRENGTHS AND WEAKNESSES

5.2.1.1. Management Capacity of the Actors in the Manisa OIZ and Ecosystem

In ecosystems that embrace innovation, it is important for the social and cultural conditions to create a suitable environment beyond economic conditions. Therefore, it is necessary for both industrialists, technologic entrepreneurs and institutions that guide, organize, and support the ecosystem to have characteristics like perspective to support innovation, willingness to take risks, mechanisms suitable for risk management,vision, and ability to adapt to change in order for innovation activities to develop in a city, region, or country.

When the actors in Manisa RIS were examined, it was seen that there was an asymmetry in the corporate actions in terms of the approach and attitude adopted towards innovation, and that the capacity to communicate, organize, and manage a project/program is underdeveloped. Discrepancies in approaches towards

R&D and innovation were observed among the institutions that feed the ecosystem.

When the management and practices of the Manisa OIZ are compared to the ones in other OIZs in Turkey, it is understood that the Manisa OIZ is among the top three OIZs in terms of the standards, quality, diversity, and features of the services it provides. The OIZ also stands out as it has the social and cultural infrastructure, at least at the physical level, as well as the economic power to support the innovation economy in the future. During interviews held with the board members of the Manisa OIZ and communications established with the manager and employees of the OIZ, it was seen that the Manisa OIZ has a potential capacity to provide coordination and collaboration for the purpose of improving the activities regarding innovation and supporting the development of the companies' R&D and innovation capacities.

Manisa Technocity tries to increase its efficiency in terms of innovation and adaptation of know-how and new technologies to Manisa with the projects it has undertaken. However, it is important for the Manisa Technocity to return to its primary function by assigning the production and commercial product manufacturing functions, which it assumed with these motives in addition to the knowhow and technology transfer, to the private sector in the medium term and to focus on production, transfer, and extension of the range of technology.

On the other hand, the fact that the Development Agency focuses on innovation and technological development in Manisa in information production and coordination functions, as well in addition to its supporting function, is one of the significant advantages.

Different levels of understanding and approach towards innovation within the industry and the ecosystem institutions limit both the innovative initiatives and the collaborations as the mechanisms to manage the risk and establish a trust environment are not sufficiently developed. The planned mechanisms to be developed in order to enhance the environment suitable for innovation may include economic (like forms of contracts that arrange the liabilities in relation to sharing of risk, cost, and return as well as the implementation of such liabilities, R&D, innovation and technology valuation) and socio-psychologic factors (collective activities focusing on improving knowledge, communication, and trust, and activities to connect the industrialists in or outside the region with other industrialists, knowledge, and investors).

Within this environment, the collective awareness of innovation, development of skills that enhance knowledge, establishment of trust and ease of collaboration, as well as the provision of resources that is suitable to meet these purposes be can accessed by industrialists of different perspectives. These kinds of mechanisms are essential for the IC to focus on when

working for skills development and coordination roles.

In addition, several organizations and tools are needed to be used to enhance the recognition of the Manisa OIZ and generate a new identity for it. The development of a creative and lively social and economic life instead of a slow one within the OIZ is considered necessary.

5.2.1.2. Human and Social Capital

Manisa's capacity for human and social capital in terms of innovation is not at the expected level compared to its economic opportunities. Further development of large companies like Vestel and the increase in the number of R&D centers and international companies has led to significant expansion of the human capital capacity in the Manisa OIZ. However, this situation is not used to returning value by transforming this capacity into R&D and innovation capacity by the Manisa OIZ.

Therefore, the Manisa OIZ needs to expand the opportunities for the companies to foster the capacities of the innovative class so that the innovation capacity of the companies can be developed. Benefitting from the capacities of engineers and R&D personnel who have an innovation-focused perspective, and developing the innovation organization skills and awareness of the industrialists can be beneficial for the companies as well.

In addition to this level of human capital, which is relatively low in the Manisa OIZ, the capacity for social capital that will make the human capital functional, activate its potential, and facilitate collaboration is rather limited. In addition to the above-mentioned assessment undertaken regarding the establishment of trust, which is the most important component of social capital, strengthening the corporate structure and increasing diversity are also considered necessary for industrial development in Manisa.

There are a limited number of institutions that support the industry in terms of not only R&D, innovation, and technology, but also knowledge and human resources compared to the city's scale, and those few institutions have limited capacity in these terms. While this is considered to be an important disadvantage for industrial development at first, Manisa's geographical proximity to Izmir grants it the potential to enable a much deeper and diversified corporate network, knowledge-based and commercial network relationships, and advanced human capital.

Since Izmir has more universities, TTOs, research infrastructures, technoparks, and qualified human resources (entrepreneurs + scientists) with more efficiency, it holds significant potential in terms of R&D infrastructure and capacity.

The majority of the white-collar personnel in the industry in Manisa commute to work from Izmir. However, the industry in Manisa has limited access to other potentials of Izmir. The competitive strategies adopted

within the industry, which is mainly based on contract manufacturing, cost advantages, and productivity, limits the demand for white-collar personnel in the industry and creates a demand for production engineers who can manage a relatively more intense workforce instead of engineers with an innovation perspective and ability to develop products.

The relationship between the Manisa industry and technopark, technocity, specialized service providers and non-governmental organizations providing solutions for different issues, forming the innovation infrastructure of Izmir, is also limited. Enriching these relationships holds the potential to improve the access of the industry in Manisa to knowledge, specialization, new ideas, and commercial connections.

In this context, the social capital does not cover only the relationships within Manisa OIZ, but the relationship networks established primarily in Izmir, and then, in Ankara, Istanbul, and at the global scale. Therefore, the Manisa OIZ needs to seize the opportunity to open up primarily to Izmir and then, to Ankara, Istanbul, and the world without turning in on itself and to move its social capital to the international arena. The role of Manisa in production and Izmir in commerce and design within the region, the methods of benefitting from the corporate structures in Izmir, the capacity of the innovative class, and the ways of performing the division of labor and postioning among the production and marketing channels will determine the functions and positioning of the IC as well as the future of the ecosystem in Manisa.

While the strategies to "attract the innovative class to Manisa" or "compete or grow on its own", instead of a division of labor based on joining Izmir or specialization in a specific field do not seem possible in the short and medium term, they do seem possible only in the long term at a rather high cost. This is because the locations that attract the innovative class the most around the world are where individuals can express themselves and live their identities. In addition to this, since Izmir offers a more developed, deeper and diversified market, this strengthens its advantageous position against Manisa in terms of easy access of the innovative class to production opportunities for life, knowledge, and economy. However, benefitting from the related specializations in Izmir especially for specific sectors and technologies, even if such specialized people will prefer commuting to work from Izmir every day, will support the development of the capacity in Manisa over time.

The main problem of Manisa's industry and Manisa in general is not individual growth strategies but the lack of information on how to enhance its competitive power in the digitalization process in line with the Turkish industry. Digitalization, the key component of the technological transformation process today, holds a capacity that can affect almost every aspect of the production and

economy including factors such as consumption patterns, production and marketing organization, supply and marketing chains, supply and demand conditions, the geographical distribution of productions, the structure of payment and transfer transactions, and technology and skills needed.

Digitalization processes directly affect the development of human capital. Digitalization changes the dynamics in the business market and reshapes people's way of working and skills needed for business.
Workers who do repetitive or codable works that are called "routine" in the production industries are particularly replaced with digital transformation. It is expected from workers to be able to adapt themselves by gaining the skill set that is constantly changing and evolving for different jobs and to become dynamic in the labor market in an environment where digitalization can change the content of jobs. This situation requires workers to fulfill new necessities that their current jobs include, gain new skills, and smoothly transition to different jobs when needed (OECD, 2018-a).

As the content and nature of jobs change, the skills needed for these jobs also evolve. And this shapes labor supply and demand, employment models, and demand for skills related to both current and new jobs (OECD, 2018-c).

Furthermore, machines or software can now improve their activities by collecting data while performing specific tasks and analyzing this data instead of just performing the tasks assigned to them in accordance with specific rules. In other words, they can increase their efficiency by constantly improving their work and provide more benefits than humans (WEF, 2018). While this process may increase the number of workers who will lose their jobs as a result of automation, it may generate new lines of work that need to be carried out in the field using machines. This transformation raises the need for the development of up-to-date employment policies not only at the company level but also at the local, regional, and national levels.

Employees are not equally affected by these transformations. While there is less demand for low-skilled workers (non-university graduates), the demand for highly qualified workers (university graduates) grows. The works that are performed by unqualified workers will be replaced by automation. Qualified workers, on the other hand, need to improve their skill set to keep up with the transformation (OECD, 2018-a).

Low-skilled workers usually lack cognitive skills. To eliminate this lack, adult education is needed. For example, a worker that has cognitive skills at the level of secondary education needs to receive education for a defined period of time so that he/she can gain cognitive skills at the high school level. Since low-skilled workers have a low level of cognitive skills and learning motivation, it is challenging to create vertical mobility in business by enhancing cognitive skills in such people.

Instead, it is possible to create horizontal mobility by improving their job-based skills. The cognitive skill levels of people working in jobs that require high levels of qualification are close to one another. The difference in the extent of skills in such employees is caused by the job-based skills they have. Job-based skills can be improved by on-the-job training. Openness and motivation towards learning in highly qualified employees enable them to accomplish quick results and update the skill set quickly (OECD, 2018-a).

According to the estimations of WEF, more than 54% of employees will need to renew and update their skills set in the medium term. Of these employees, 35% need to receive training for up to 6 months, 9% for up to 12 months, and 10% for more than 1 year (WEF, 2018).

However, it is quite likely that the new positions that are left open due to people losing their jobs will be fulfilled by people with different skill sets. Therefore, the structure of employment will change, and the gaps between the skills needed and the qualifications people have will need to be filled with training. If such a gap cannot be filled with training, new personnel who have the necessary qualifications will be hired and those who do not have the necessary skills will lose their jobs. In this way, companies will be free from unnecessary workforce burden that they have been bearing and can transform their workforce potentials in accordance with the new requirements (WEF, 2018).

Employment of people who have the skills required by new technologies will have priority. However, training current employees is quite important for companies even if it may seem inefficient due to such reasons as the cost and time needed for training. Training employees who have knowledge of the activities of the company and have worked for the company for a defined period of time will provide significant advantage to the companies and will transform these employees into great potential. Therefore, companies should first focus on their available labor resource, provide training to their employees in line with the skills required by new technologies, guide them in this direction, and try to help them reach their full potential (WEF, 2018).

The processes mentioned above that are caused by digital transformation will affect the companies in the Manisa OIZ considerably. In this scope, these processes need to be taken into account when planning the skills development activities of the IC, and the training needs need to be met in a cost-effective way by organizing collective programs for skills development in the activities to be carried out at the company level.

In addition, developing the skills of the industrialists and ecosystem institutions in Manisa to establish

network relationships can enable connections that can make it easier for the industry to access the knowledge, experts, and institutions in Manisa and in other cities. This can enable the simplification of innovation and R&D activities and allow industrialists to stand out. These are among the areas that are seen to be beneficial for the IC to focus on within the skills, development and coordination functions.

5.2.1.3. Production, Brand, and Innovation Capacities of Companies

While science-based startups in Turkey are located in Ankara, startups which focus on commerce either operate in Istanbul or move there as they become successful. Startups that can access international financing move their activities to the international arena.

There is no startup capacity in Manisa in proportion to the power and scale of industrial production. While there are some enterprises that have recently gained speed in Manisa Technocity, most of the companies there try to survive with government aid or some software services they provide to the market. In addition, a limited number of startups try to develop products for the defense industry.

When it is considered in terms of the industry, a total of around 50 companies that do business in electronics and automotive supply industry sectors and supply products to these sectors have solid projects in R&D and innovation. 32 of these are already R&D centers.

The industry culture in companies, other than those a few, mainly follows the notion of "buy more machines, produce, and sell what is produced". These are the companies that do not create their own brand, except for a few sectors like the food sector, and, in other words, do only contract manufacturing.

As the innovation capacity of the companies expands, it is expected that the companies create their own brands and start branding activities in the long term. Within this context, the IC can support the activities of the companies to create a brand for themselves at the national and international level and help them access more effective support. For example, the gaps in the companies can be filled so that they can access the Turquality support provided by the Ministry of Commerce and avail of similar supports.

Therefore, while the companies in the Manisa OIZ have production capacity, this capacity needs to be supported with branding and innovation activities.

The said companies will face challenges in innovation and digitalization in the future. As mentioned in the previous chapter,

digital transformation will bring considerable structural changes and cause data-focused innovation strategies to be adopted in business models (OECD, 2018-b).

The adaptation of new technologies as well as innovation and R&D activities are among the most important factors that will positively affect and speed up the digitalization and growth of companies. These aspects can enable companies to do business in various fields and play an important role in companies' development of their current systems to increase their efficiency and speed up their growth (WEF, 2018).

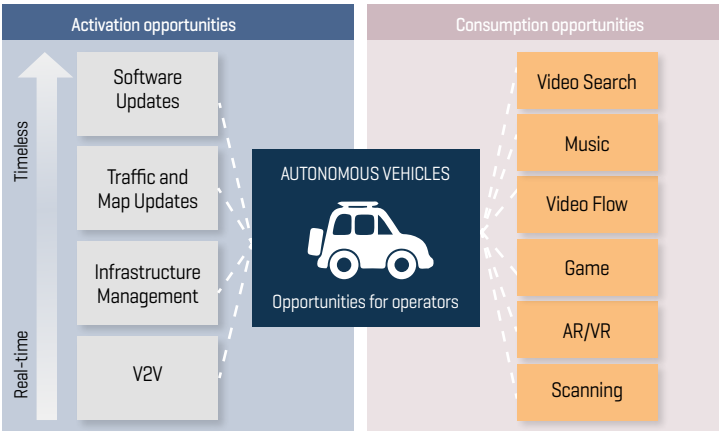
According to WEF (2018), the technologies whose adaptation is expected in the medium term are big data analysis, app/web-based markets, internet of things, machine learning, and cloud technologies. These technologies will not only expand the companies' business network but also improve their systems. Fundamental changes in technology and production systems and the emergence of new industries are the main motives behind growth and development. Due to the popular and deep impact of multi-purpose sensors, robotics, the internet of things or 3D printing on production, it is predicted that we may experience job losses at an unprecedented rate (OECD, 2018-b).

Three technological megatrends drive the digital transformation in production. These are (i) connectivity, (ii) intelligence, and (iii) flexible automation. Connectivity is the integration of all processes and tools used in the production chain, visibility in the whole production chain from end to end and enabling of awareness and traceability. Smartness means observing the whole production operation, processing information, and making a decision. Lastly, flexible automation enables the processes that are integrated together and include machines in their decision-making mechanisms to be observed closely, adjusted when needed, and controlled remotely. The companies that are able to keep up with these megatrends succeed at this transformation process (WEF, 2019).

Digital technologies considerably affect innovation activities in various sectors. Those most affected are the automotive, agriculture, and retail sales sectors. Digital technologies enable the manufacturing of new products, the creation of new business models, and the improvement of traditional products (OECD, 2019-a).

The automotive industry is the leading sector where the greatest developments and innovations take place. When it is considered that one of the sectors where Manisa has the most influence is the automotive supply industry, adaptation of this sector to digitalization gains importance as well. With this in mind, the main aspects of the digitalization process are summarized in Box 1.

Box 1 Digitalization in the Automotive Industry



- With digital technologies, cars can process the data they collect from the environment around them and transmit this data to other cars and electronic devices by connecting to them. Thanks to the cars that are in communication with each other, driving safety is optimized, and various advantages are provided like the automatic call for help in case of an accident, notification of any roadwork ahead, car failure warnings, smart parking, and smart navigation apps according to the instant traffic data.

- Autonomous driving is evolving rapidly. New vehicles are equipped with driving assistants. Those driving assistants support the driver in controlling the vehicle and help the driver in such actions as parking or speed control. Studies continue on fully autonomous driving technology.

- It can be said that "smart factories" are another innovation in the automotive sector. For example, Hirotec, a Japanese auto part manufacturer, predicted possible errors using the machine learning technology and performing data analysis and minimized the risk of losing money and time due to such errors.

- Lastly, "vehicle providers" are one of the digital era innovations. Today, people share their cars with others. They started to meet their transportation needs by finding an available vehicle and driver with real-time applications. UBER and Zipcar are examples of this concept.

Source: OECD, 2019-a

Innovation is one of the most important factors of growth and development. The factors that affect innovation capacities of companies can be listed as follows:

- Skill and resource problems,
- Failures and faults in the market,
- Obstacles hindering innovative entrepreneurs,
- Lack of appropriate situations for investing in innovation and R&D, and
- Collaboration failures within innovation systems (OECD, 2019-b).

When these are evaluated together, it is considered that the IC can play an active role in such issues as expanding the innovation capacity of the companies in the Manisa OIZ to prepare them for the digitalization process and guide the industry in Manisa during this process.

5.2.2. OPPORTUNITIES AND THREATS

5.2.2.1. Collaboration Opportunities and Digitalization in Electronics, Automotive, and Information Sectors

Digitalization transforms all production and consumption processes. 3D printers, the internet of things, and AI apps considerably change the spatial organization and production dynamics in the industry. This restructuring process may negatively affect Manisa's position in the production organization. The digitalization process makes medium-high and high-technology sectors more competitive along with the traditional ones. In parallel to this, the transformative impact of the platform economies and changeover of value chains are considered as a significant risk that may have negative effects on the industry in Manisa.

These developments indicate an important change in production processes. Especially the developments in 3D printers, cost reduction, and minimization principle with new material technologies make additive manufacturing mechanisms more effective.

It can be considered that this process will force, for example, the companies in the fabricated metal goods sector that do contract manufacturing at SME scale in Manisa to make high-cost investments and to carry out the accompanying innovation activities.

In this process, there is an opportunity to develop multi-functional and diversified applications by integrating potentially powerful electronics, automotive, and information sectors with especially the software sector in Manisa.

There are 27 companies in the Manisa OIZ that engage in business in the electronics and software sector. Similarly, there are 21 companies in the machine industry and 13 in the automotive. When the capacities of the companies in the Technopark are considered as well, there is a potential to establish critical collaborations

in the upcoming period. In Manisa, especially in electronics, there are large market maker companies. Vestel and Bosch are two such companies.In this context, improving collaboration among automotive, electronics, and information sectors in Manisa can be considered as one of the functions of the IC.

5.3. Vision, Mission, Road Map, and Objectives

In this section, the motto, vision, mission, and principles of the IC are identified. The vision of the IC and the strategy and road map that are determined to realize this mission are given at the end of the section and include the objectives, strategy, and actions identified for the short and medium-long term.

First of all, the IC will complete its establishment process and start providing services to the companies in the Manisa OIZ. The exclusive objective of the IC is to develop Manisa's regional innovation ecosystem. The basic strategy it will adopt to achieve this objective is to enhance the collaboration between the actors that act within the Manisa Regional Innovation System and develop their skills to offer them to the industry. As its supplementary role, the IC will strive to help the industrialists and other institutions access such capacity as information, financing, and commercial connections outside of the region.

The basic principles of the Innovation Center are defined as inclusiveness, selectivity, complementarity, and development by learning.

Inclusiveness Principle: Inclusiveness means reaching all companies in the Manisa OIZ as well as other industrial institutions in Manisa to the extent that resources and functions of the IC will allow.

Selectivity Principle: The projection of the planned IC to be established as a small and flexible structure with limited resources at hand require it to focus on the areas where it can create the greatest impact and to prioritize the problems in the industry. It will conduct sectoral activities especially for the specific and powerful sectors in the industry to further develop. As per this principle, the IC will conduct its activities not to solve all of the problems of the Manisa OIZ, but to develop its technologies, functions, and capacity to access stakeholders and resources critical for the sector.

Complementarity Principle: The IC will perform activities in collaboration with mainly the structures such as the industrialists, technoparks, research infrastructures, and TTOs in Manisa to improve innovation and product development skills so that it can contribute to the development of the

companies. As an interface structure, the IC will generate the necessary mechanisms, enable network relationships, and re-establish the network. In addition, it will pave the way for the companies in the Manisa OIZ to reach government aid and business development services that they have difficulty in accessing. In this sense, the IC will focus on enabling the efficiency of the services already provided in the ecosystem, establishing collaboration, and helping the companies access services and resources instead of merely imitating what has already been done.

Developing by Learning Principle: The IC needs to be constantly evolving to understand the developments around the world and in the country. To do so, it should monitor the developing companies in the Manisa OIZ, observe the success and failure factors and disruptions or opportunities in the innovation system, develop products and services in this direction, and update and reposition itself in accordance with the development scenarios of the stakeholders. In line with these basic principles, it will be focusing on skills development and innovation in the short term and business development and coordination in the medium-long term as well as commercialization areas that intersect all of these processes.

For this purpose, it is predicted that a pilot project will be implemented. The strategy on this matter will expand the capacity of the companies in the Manisa OIZ and strengthen the relationship between organizations.

Once the pilot project is implemented, the structuring of the IC and its next steps for the medium-long term will be evaluated more clearly.

5.3.1. MOTTO, VISION AND MISSION

Figure 8 Strategic Framework with Time Range

Short Term (1 to 2 years)		Medium Term (3 to 5 years)	
Skills Development	**Innovation**	**Business Development**	**Coordination**
Creating networks and building trust between actors	Improving R&D, innovation, entrepreneurship and digitalization capacity of companies	Developing collaboration between clusters, R&D centers and other companies	Providing access to Izmir, developed cities and the international arena
Improving the professional qualification and capabilities of R&D employees in companies	Enhancing the corporate and innovative capacity of the OIZ	Improving the collaboration between industry and startups for commercialization	Simplifying access to platforms and interfaces

5.3.2. ROAD MAP

The road map identifies the long, medium and short-term objectives in three phases.

5.3.2.1. Medium-Long Term: Professionalization and Gaining Power in The Network

The objectives of the IC can be identified as follows in accordance with the analyses performed as well as recommendations and projections of the participants.

- In the medium term, to professionalize in the areas and functions it focuses upon and to make significant contributions to the innovative capacity of the Manisa OIZ,

- In the long term, to expand the collaboration and coordination capacity between government institutions, universities and affiliates, industry, and technology-based enterprises with the functions it focuses on and to become a competitive factor that complements Manisa and the Manisa-Izmir ecosystem.

- In the end, to contribute to the creation of brand value and increasing recognition of the Manisa OIZ and Manisa in terms of innovation.

In this direction, it is planned that the IC will implement support programs in coordination, innovation, collaboration, and skills development together with local administrations and the Development Agency, acting towards the needs of the Manisa OIZ.

5.3.2.2. Short Term: Establishment, Institutionalization, and Recognition

A pilot project for each of the fields of skills development and innovation, which are among the basic functions of the center, will be implemented in the first 1 to 2 years so that the IC can be designed and developed with experience.

The impacts of a planned pilot project to be implemented for skills development and innovation, which are identified as the primary areas to be acted on in the current status and needs analysis reports as well as the SWOT analysis, will be evaluated and thus, data and experience to review the medium- and long-term strategies will be gained.

5.3.3. OBJECTIVES, TARGETS, AND ACTIONS

Objectives, targets, and actions are given under short and medium-long term.

The short-term is defined in the clearest way and identified with actions. The medium-long-term objectives and targets are set as general guiding strategies that will be revised and clarified after the impact evaluation.

The budgets given based on the targets are estimated based on similar support programs and experience gained in this field.

SHORT TERM (1 to 2 years)

The Manisa OIZ Innovation Center Draft Action Plan, Outputs, and Result

Activities

0. The Strategy and Road Map, and the Pilot Implementation Will Be Finalized by the MOIZ Management, Stakeholders, and Project Team.

- 0.1 Identification of performance indicators
- 0.2 Identification of procedures and principles of post-project evaluation

1. Structuring of The Innovation Center Will Be Completed.

- 1.1 Establishing the human resources and corporate infrastructure of the Innovation Center
- 1.2 Preparing the business model of the Innovation Center
- 1.3 Determining the sustainability strategy of the Innovation Center

2. The Innovation Potential of Companies Will Be Determined, and Their Capacities Will Be Expanded.

- 2.1 The innovation capacity of the companies will be determined, and road maps suitable for their development status will be prepared.
- 2.2 The "Applied Change and Transformation Management Mentorship and Training Program" will be designed and implemented.
- 2.3 Government aid and other national and international funds will be enabled.

3. Clustering and Value Chain Potential Will Be Determined and Improved.

3.1 Potential clustering areas will be identified, and value chain maps will be created.

3.2 Clustering activities will be started, and the clusters will be made to be EU-accredited.

4. Pilot Project Will Be Evaluated.

EXPECTED OUTPUTS

1. Establishment and Activation of the MOIZ Innovation Center
2. Expanding the Innovation Capacities of the Companies Operating in the Region
3. Developing Clustering Activities

UNEXPECTED RESULTS

Transformation of MOIZ Into an Innovative OIZ, and The Capacity Improvement of Manisa Regional Innovative System in terms of National and International Collaboration.

MEDIUM-LONG TERM (3 to 5 years)

Objective 1:
Mechanisms will be developed to support the companies in the Manisa OIZ for skills development, innovation, coordination, and collaboration using the outputs of the pilot project of which the implementation is completed.

Objective 2:
The capacity of R&D centers, SMEs, clusters, and other ecosystem actors to collaborate will be expanded so that joint projects can be developed.

Objective 3:
The collaboration between university, industry, and technology-based enterprises will be improved to contribute to the global recognition of the Manisa OIZ.

5.4. End-of-Chapter Review

Research studies regarding the innovation center that is planned to be established in the Manisa OIZ have been completed, and a strategic framework and action plan draft for the center have been created based on the opinions of the stakeholders and technical studies.

In line with the stakeholders' opinions and expectations regarding the center, the strategic framework and action plan are both designed in a way that is capable of being integral among the current institutions and interfaces, and addressing the transformation, development and growth needs of the industry.

Main subjects that are evaluated in the SWOT analysis are the capacity of the Manisa OIZ and the ecosystem institutions; production, brand, and innovation capacities of the companies; collaboration opportunities in electronics, automotive, and information sectors; risks that may be caused by digital transformation, and Manisa's social and human capital driven by the workforce from Izmir.

Considering the strategic evaluation of the analyses carried out in the study and the opinions of the stakeholders in Manisa regarding the IC, a strategic framework for the establishment and operation of the IC has been prepared. This strategic framework that will affect the functions, organization, working style and culture of the IC is summarized in the table below.

Table 31 **Strategic Framework of Manisa OIZ IC**

Motto	Bringing Together Production and Innovativeness Within the Manisa OIZ
Vision	Make Manisa OIZ One of World's and Turkey's Most Recognized Industrial and Technological Zones in the Area of Innovative Production
Mission	Enhancing R&D and Technology Capacities and Accelerating the Digitalization Processes of Companies Operating in the Region by Developing an Innovative OIZ
Functional Areas of Focus	Short Term: Skills Development and Innovativeness Medium-Long Term: Coordination and Business Development

The action plan for the implementation of the IC includes the structuring of the center at the minimum level in the short term and the gradual creation of a center by implementing pilot projects. It is important for the pilot implementation, whose details are given in the next section, to focus on skills development and innovation in particular. It is predicted that the establishment of the IC will be completed in the medium term. Over time, the IC is foreseen to become one of key parts of the Manisa OIZ and RIS by institutionalization and becoming integrated with the main elements of the ecosystem.

In the long term, the IC will maintain its operations towards the primary needs of companies in areas of skills development, collaboration, innovativeness and coordination, in order to advance the Manisa OIZ companies' capacities in innovation and digitalization.

As a result, a pilot implementation project to realize the short-term objectives of the strategy and road map determined has been designed and explained in the following section.

6 PILOT IMPLEMENTATION PROJECT

Manisa OIZ Campus Area
MOSPARK

In the Strategy and Road Map (SRM) study, two primary development areas are identified to support the companies. The first area covers skills building and development activities at the corporate level, while the second area includes activities to expand innovation capacity throughout the ecosystem. Activities that are planned to be conducted in both areas include systemic steps towards increasing the innovation capacities, and hence, the competitive power of the companies.

"Skills development and innovation", which are the short-term functional focus areas of Manisa OIZ Innovation Center SRM, set the framework of the activities to be conducted in the pilot project. In this context, the designed pilot implementation project will include the primary activities in skills development and innovation and focus on expanding the human, social, and innovation capacities of human resources of the Manisa OIZ and the companies operating there. For this purpose, the primary action of the SRM is to complete the establishment process of the Manisa OIZ IC at a minimum. The next step is to identify the capacity development activities for this structure in accordance with the functional focus areas and to conduct these activities.

There are two expected results determined for the pilot project that has been designed in accordance with the short-term functional focus areas identified in the Strategy and Road Map. "Establishment of the corporate infrastructure of the regional innovation ecosystem" is the first result expected from the pilot project and refers to the basic establishment activities of the Manisa OIZ IC. Once the first expected result, which covers the primary activities to be carried out in the establishment process of the IC, is achieved, another expected result is identified, which covers all of the activities including short-term functional focus areas.

The second expected result of the pilot project is defined as the "development of innovation capacities of institutions and companies operating in the region". As per the said expected result, organization of activities that involve the organizations and institutions that form the economic geography of the Manisa OIZ and the city of Manisa, mainly the companies operating in the target OIZ, is planned.

The specific purpose that the results expected to be achieved at the end of the project serve is transforming the Manisa Organized Industrial Zone into an exemplary region in terms of innovation. As stated in the conceptual framework section of the report, the establishment and development of innovation ecosystems are among the most important objectives of government policies.

Supporting the organizations, institutions, and individuals that are parts of a specific value chain in accordance with the determined regional development objectives forms the basis of the industry, or in other words, of innovation policies.

The main reason for the interest for innovation ecosystems is the companies' need for expanding their extensive and applied collaboration with other enterprises that operate within the value chain or directly with their competitors in the production process of goods and services that are getting more complicated and hence, gaining more added value every day.

In order for the exclusive purpose determined for the pilot project to be achieved, mechanisms that will expand the capacities of the actors operating in Manisa economic geography will be planned in a systematic way. Increasing the added value in the produced goods and services by developing the regional innovation ecosystem in Manisa will make significant contributions to improve the competitive power of the city.

Within the scope of the determined objectives, the aim is to contribute to the transformation of the Manisa OIZ into an innovative OIZ, which is established primarily to expand the innovation capacities of the companies operating in the OIZ and to provide the industrial field, infrastructures, and basic social services needed as per Industry 2.0 or productivity economy requirements.

The establishment of the IC and the pilot project implementation will contribute to the transformation of the OIZ by revealing the structuring dynamics of the center and expanding the innovation capacities of the companies.

As a result of the planned activities to be carried out within the framework of the short-term functionality focus areas, it is intended to restructure the Manisa OIZ IC in a more realistic way with its experience based on field implementations and the data collected in the medium-long term. In the scope of this restructuring, which covers the medium-long term, it is planned to identify the activities that will drive income and to create a business model for the region.

In this last section of the study, the pilot project's general framework, basic components, subject, objective, scope, parameters, limits, indications, and job descriptions of the project stakeholders will be outlined.

Although the pilot project is defined within the scope of short-term functional focus areas, it will be redefined within a holistic framework that includes medium-long term objectives. Throughout this section, a comprehensive discussion will be provided regarding the establishment process of an institution that has the competencies and opportunities that will establish the structure, functions and coordination between actors in line with a specific business model for the development of an innovation ecosystem in the city of Manisa.

6.1. General Framework

The pilot project is outlined as a result of a three-phase study that includes the literature review carried out for the regional innovation ecosystem, current status assessment, and needs analysis prepared in light of the data collected as a result of the field study. As clearly stated in its exclusive objective, the project aims to demonstrate that the MOIZ is a good implantation example in the area of innovation within the regional innovation ecosystem strategy of Manisa. These studies both establish a basic model for the structuring process of the Manisa OIZ IC and form the basis for the pilot project that is designed to expand the innovation capacity of the companies operating within the Manisa OIZ and the region.

In order for the pilot project to be conducted effectively, the IC will be established and put into operation in the first phase. In the studies carried out, the primary areas that the IC will interfere in have been identified as skills development and innovation. In the initial structuring of the IC, it is necessary that the IC will be equipped with human resources which have the skill set that will enable them to work on these areas.

In digital transformation processes, the innovation capacities of companies are defined in a rather broad sense. When it is considered that a company competes within the market mechanism using the capital it generates, the innovation capacity of the company can be identified within the scope of the capital theory.

In general, components of capital that form the innovation capacity of companies can be summarized as follows:

Human Capital: Qualified human resource of the company, R&D employees, management quality, employees' level of knowledge in innovation and R&D, employees' skills in technology development and commercialization, and employees' entrepreneurship capacity.

Social Capital: Level of collaboration with research infrastructure, networks, and platforms in which the company is a participant, as well as universities with which it engages in joint operations, other companies, start-ups, and the actors in the ecosystem.

Economic Capital: Financial resources that the company can use for innovation activities as well as the company's R&D expenditure and investment, number of projects, innovation infrastructure, location, machine-equipment-tool park, intellectual and industrial property rights (patents, utility model, brand, industrial design, etc.), and level of benefit from R&D and innovation aid.

Cultural Capital: Level of institutionalization, vision, strategy, and policy of R&D and innovation, openness to learning, knowledge intake capacity, inclination towards open innovation, innovative management and leadership, and importance given to R&D, which indicate the innovation culture of the company.

Relational Capital: Company's achievement in innovativeness and R&D by means of making connections between other forms of capital and its organizational skills in this matter. In this context, the components of capital that the companies have need to be improved to expand their innovation capacity. The pilot project will try to expand the innovation capacity of companies and develop an intervention strategy based on the approach of components of capital.

6.2. Fundamental Elements of the Pilot Project

In this section, the objective, subject, and parameters of the designed pilot project are explained.

6.2.1. OBJECTIVE

This section outlines the components of the intervention logic that underlies the perception and resolution of the problem addressed within the project. General objective, exclusive objective, and expected results, which are the fundamental components of the intervention logic that we will try to explain in the following section, are schematically given below.

The Basic Intervention Logic of the Project

General Objective	General Objective	General Objective
Improving Manisa's regional competitiveness	The strategy and road map, and the pilot implementation will be finalized by the MOIZ management, stakeholders, and project team.	The transformation of the MOIZ into an innovative OIZ, and the capacity improvement of Manisa Regional Innovative System in terms of national and international collaboration
Exclusive Objective	Structuring of the Innovation Center will be completed.	
Making the MOIZ an exemplary region in innovativeness	The innovation potential of companies will be determined, and their capacities will be expanded.	
	Clustering and value chain potential will be determined and improved.	
	A post-project evaluation study will be carried out.	

In terms of the intervention logic, the general objective is for the pilot project to contribute to the long term is defined as improving Manisa's regional competitiveness. The strategy adopted for the pilot project to achieve the determined general objective is primarily to expand the innovation capacity of the actors starting from the Manisa OIZ and moving towards the general economic geography of Manisa.

In line with this strategy, the development of the regional innovation ecosystem in Manisa is the exclusive objective of the pilot project. In this sense, it is important to base the creation of the aimed innovation ecosystem on a sustainable foundation with a holistic point of view, and to ensure the sustainability of innovation capacity development programs conducted for the ecosystem actors. The needs identified as a result of the analysis of the data obtained from the field also emphasize the need for the development of the skill sets for the purpose of expanding the innovation capacities of the ecosystem actors.

There are four fundamental approaches to be handled with care within the pilot project to achieve the determined objectives and help the ecosystem gain its adaptation power. Before discussing the expected results that need to be achieved in order to realize the exclusive objective of the project, it will be beneficial to define the position of the said approaches within the project. These four approaches form the fundamental philosophy that will guide the design and implementation phases of theproject activities. Fundamental approaches within the pilot project are listed below:

i. Change Orientation: As often pointed out in the report, the spreading of information technologies to all industries leads to important changes both in terms of manufacturing processes and the quality of manufactured products. Henceforth, businesses' share in the global value chains may be increased thanks to the digitalization of manufacturing processes and the manufactured products. A suitable environment must be created for actors in the Manisa innovation ecosystem to be able to properly analyze the observed changes in global value chains and develop competencies required by areas of higher added value through entrepreneurial exploration, in order to expand their range of competencies.

Therefore, the project will prioritize activities which will form the infrastructure required to enable the transition to value-added products that are intended to increase the share of businesses in the global value chains, rather than cost-decreasing innovation activities. Within this scope, applied training sessions on change management which will facilitate the realization of entrepreneurial exploration processes planned to be initiated by target institutions, together with the planned mentorship systems to be created, will be designed in line with the characteristics of the region in the form of fundamental tools aimed at developing the Manisa innovation ecosystem.

ii. Holistic Approach: Designing all the activities of the pilot project holistically, in a systematic way, by taking into account their consequences in the medium and long term is the most important factor which will increase activity effectiveness and efficiency. Gradually expanding the area of influence for activities to be further carried out willingly,without spoiling the balance among the actors can only be possible with a holistic approach and design, which will develop an environment of trust and collaboration on an ecosystem scale. As a requirement of this approach, conflicting interests, duties and responsibilities of actors operating within the ecosystem scale must be analyzed, and fundamental actors of the transformation must be identified, while maximum use must be made of the findings acquired.

iii. Duty Orientation: To develop an innovativeness ecosystem in Manisa, it is crucially important that all activities to be carried out are categorized as per the fundamental needs of the local actors and designed in a way to allow for systematic development. It is the fundamental principal of the duty-based approach to fulfill the duties, which are determined by way of utilizing participation mechanisms, via collaboration between relevant stakeholders. The duty-based approach envisages that all activities planned to be carried out as part of the project scope are evaluated in line with the duties identified, in an effort to eliminate the risk of confusing ends and means, which is a typical problem encountered in the implementation phase of many projects.

iv. Sustainability: It is of crucial importance to establish mechanisms which are necessary to ensure technical, executive and financial sustainability of the project at the design stage. One of the fundamental methods to achieve technical sustainability of the project is to design the project activities to be performed in a way that incorporates elements which will enable the Manisa OIZ and the businesses in this region -the project's target group- to gradually internalize the culture of continuous change and innovativeness. As an objective of this method, which is studied in detail in later parts of the document, the training design envisages that participants gain the ability to implement the learned techniques in their own institutions, and all implementation processes will be closely monitored by mentors within a scheduled time.

In this scope, the training programs will be rigorously designed and structured in a way that contains modularized implementation and mentorship phases. On the other hand, in order to create an innovative ecosystem and for the institutions and businesses operating in that ecosystem to be able to sustain a collaboration-based innovation strategy, neutral formations are needed to act as interfaces to drive the function of coordination.

Thus, it is the primary output of the project to establish the Manisa OIZ Innovation Center as a legal institution, as the most important means to enable the sustainability of the pilot project. In the last step, the ability to ensure financial sustainability, which is closely related to executive sustainability, will depend on the designing of a realistic business model for the Manisa OIZ Innovation Center, which will be positioned as an interface. Another expected output from the project is the utilization of the knowledge and experience to be gained in the pilot project to design an innovative business model for the Manisa OIZ Innovation Center.

The expected outcome of the project is to transform the MOIZ into an innovative OIZ, and therefore improve the national and international collaborative capacity of the Manisa regional innovation system. A three-stage plan was designed to enable this outcome.

The first stage covers the establishment of the Manisa OIZ Innovation Center and is defined as "forming the institutional infrastructure of the regional innovation ecosystem".

The second stage, defined as the "development of innovative capacities of institutions and businesses operating in the region", includes activities directed to increase the ecosystem's actors' innovative capacities within the fundamental principles identified. The second stage, which is planned to acquire the expected result, will first see the realization of activities which are intended to develop the innovation capacities of the Manisa OIZ and the businesses operating in the region. The objective in the third stage is to initiate the activities aimed at institutionalizing the aggregations which are defined primarily within the scope of the TR33 Region Plan (2014-2023) and various plans, strategies and reports. The specific objective is defined as the ***"Creation of clusters identified in Manisa's innovation ecosystem".***

Activities at the initial stage of the intervention logic include the activities planned to realize the defined objective and expected outcome. Within this scope, the activities planned to be undertaken as part of the pilot project are broken down into five different categories. These activities, which are explained in further detail in later parts of the document, and fundamental expectations regarding the implementation are listed as follows:

1. The strategy and road map, as well as the pilot implementation, will be finalized by the MOIZ management, stakeholders, and the project team: The strategy and road map, which are outlined as part of the fieldwork, will be re-defined at the implementation level with the participation of all relevant stakeholders. In the activities to be undertaken within this scope, the strategy and road map is among the imperatives that are planned in a simple way that is easily understandable by every

party so that the project can be effectively implemented. It is believed that a strategy and road map easily understood by every stakeholder will contribute to the transparency and accountability characteristics of the project.

2. Structuring of the innovation center will be completed: The activities to be undertaken within this scope will focus primarily on the business model that will provide the basis on which the innovation center will be established and the institutional structuring of the innovation center. To identify a realistic and resilient business model, the needs of the businesses operating in the organized industrial zone, for which they agree to incur costs, will be identified and a demand-based approach will be adopted. This will help empower the center to sustain itself with the least amount of support in the medium and long term.

3. Businesses' innovation potential will be identified, and capacities will be improved: The backbone of this implementation is to identify businesses' innovation potential regarding their manufacturing processes and products, and to determine the areas of development. Training and consultancy services towards innovative project implementations are planned to be provided through improvement of the current capacities of businesses whose areas of development are determined within the scope of innovation.

4. Clustering and value chain potential will be determined and improved: Clusters are the primary intervention tools used to realize the objective of improving innovative capacity. Providing support to research-based clusters formed via the collaboration of businesses and supplementary institutions operating in certain value chains or thematic areas is regarded as one of the most important tools to bring sustainability to the innovation system.

5. A post-project evaluation study will be carried out: As is presently known, the evaluation stage after a convincing project is only made possible by gathering initial data and setting desired objectives during project design. Therefore, the initial data to be gathered during the first month of the project will be used to verify the measurable performance criteria to be acquired by the end of the project. A proper impact assessment of the project can be made in three years, at minimum, after the completion of the project.

6.2.2. SUBJECT

The subject of this study is to improve the innovative capacities of the Manisa OIZ and the businesses operating in the OIZ in collaboration with relevant actors under the coordination of the Manisa OIZ IC. In other words, the project covers activities which are intended to improve businesses' innovation capacities by way of improving their human, social, cultural and economic capitals.

Manufacturing methods and processes are currently in a process of evolution. The paradigm shift in manufacturing and the resulting gradual development of 3-D printers, together with tendencies in material technologies and software as well as creative skills which now play major roles in product costs prompt companies for change. The majority of companies in the Manisa OIZ have difficulties to self-improve in line with these developments. A very small percentage (3 percent) of the companies settled in the Manisa OIZ invests in R&D and innovation to gain competitiveness, while other companies prominently adopt competition strategies that are based on effectiveness and prices. In these circumstances, it can be foreseen that many of these companies will have difficulties to compete in terms of price in the medium and long term. Therefore, industries such as Manisa which are based on contract manufacturing can reasonably be expected to arrive at breaking points. We have entered the age where companies who can adapt to the times and are flexible enough to accept changes can survive.

The capacities of companies in the Manisa OIZ must be increased to adapt to the conditions of innovation and competition so that companies are ready for the contemporary environment. In this sense, the objective with the pilot project is to improve the elements related to monetary capital, which comprises a company's innovation capacity.

1. Reinforcing companies' human capital: The process of digitalization and the accelerating transition in companies to digitalization and robotization lead to changes in qualifications expected from human assets. This means that personnel also need to adapt to contemporary business requirements, improve their skill sets and improve in their respective area of profession. Despite a considerable general improvement in recent years, companies in the Manisa OIZ need to improve their human capital to match the requirements of competition at the domestic and international level.

2. Reinforcing companies' social capital: Collaborations of companies in the Manisa OIZ with other companies and the actors in the Manisa RIS must be increased. Despite the readily developed business relations between companies in Manisa and Izmir, it is understood that there is still considerable room for improvement in this regard. The relationships of companies in the Manisa OIZ with actors such as the TTO, Technopark, research centers, universities and consultancy companies in the Izmir Regional Innovation System are not at an optimum level. These weak relationships mean that companies in Manisa cannot make good use of the business opportunities, human skills and business networks that are readily present in Izmir. It is also important that besides the opportunities in Izmir, opportunities in other big cities such as Ankara and Istanbul are made accessible to companies and ecosystem actors based in Manisa.

In this direction, the pilot project will include activities directed at reinforcing the connections with RIS actors in Manisa, followed by regional ecosystems in Izmir, Ankara and Istanbul.

3. Reinforcing companies' economic capital: For many companies which follow a competition strategy based on a productivity economy, allocating high finance levels for R&D and developing necessary infrastructure appears to be very difficult. For this purpose, activities will be directed to reinforce companies' access to support opportunities and services which can improve their economic capital.

4. Reinforcing companies' cultural capital: This requires improving the awareness and culture of innovation in companies, recruiting personnel for the innovative class and providing optimal working conditions for this class. However, it takes time for an industrialist, who mostly grew up with traditional methods of manufacturing, to adopt innovative activities and to understand the importance of innovation in order to increase their competitive power and sustainability. The scope of the project will include activities directed at creating awareness and a culture of innovation within companies, and institutionalizing innovation.

5. Reinforcing companies' relational capital: In order to increase companies' innovation capacities, their current standings in this area must be determined.

It is crucial for companies' levels in terms of innovation and R&D, their executive approaches, outcomes of projects currently being developed, and successful and unsuccessful practices in the area of their planned steps for the foreseeable future to be known. Therefore, a good start is to create a checklist for innovation which includes every element or requirements related to, including, but not limited to human, social, economic and cultural capitals. While a current implementation directed at measuring companies' innovation capacity can be utilized for this purpose, a similar tool for measuring and evaluating the same can also be developed by the IC. Such an approach would reveal what advancements must be achieved in a company, while contributing to institutionalization of innovation within that company. In this direction, this innovation plan, which maps a company's relational capital and builds the operations to be run in collaboration with the company are also included among the subject matters of the pilot project.

6. Developing the Manisa OIZ's corporate capacity: The OIZ management is among the highest developed OIZ structures in Turkey in terms of economy, human assets, social structure and management. Every practice and element of the productivity economy are realized at successful levels in the OIZ. However, rapid developments in the areas of manufacturing, distribution and marketing have started taking heavier tolls on the companies.

This new period requires Manisa OIZ to develop its own management and operation capacity, to be able to contribute to other companies operating within the OIZ in improving their innovation capacities and competitive power.

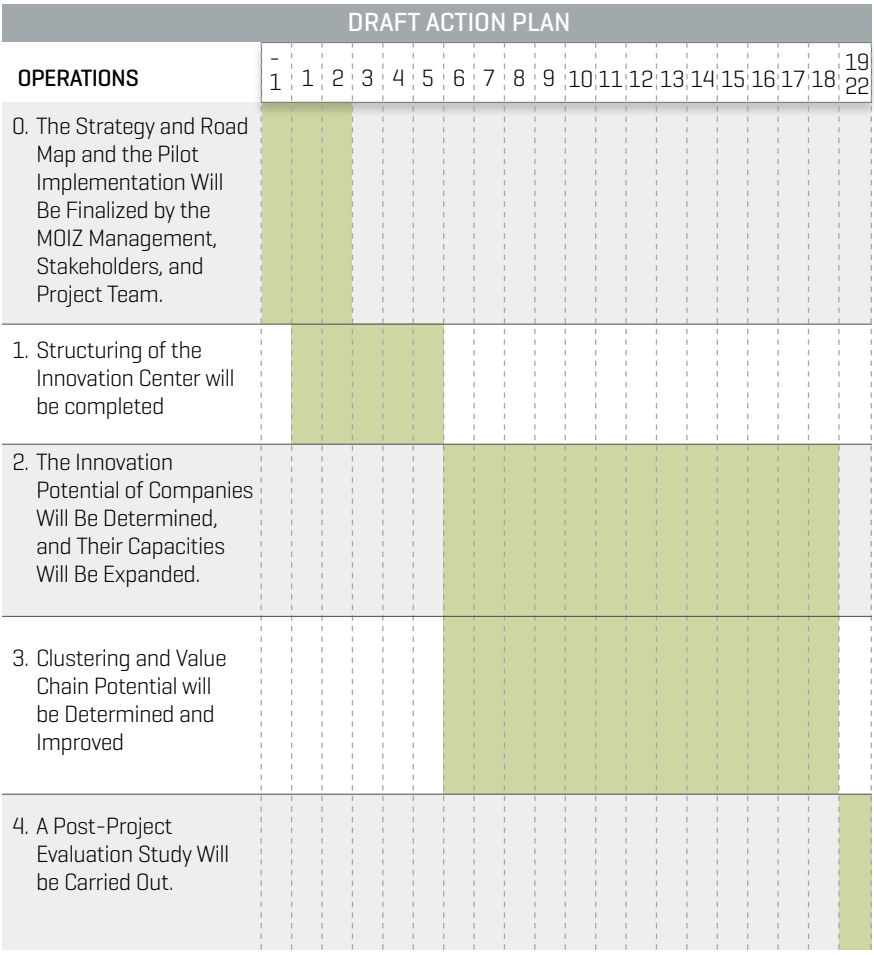
In short, the main subject of the pilot project is to present complementary practices aimed at improving the corporate capacity of the Manisa OIZ to transform the OIZ into a new generation OIZ, and to prepare the companies in the OIZ to digitalize and to the competition which comes with it.

6.2.3 PARAMETERS

This title contains information regarding project duration, draft action plan, fundamental outputs, project budget and target groups.

Project duration: 18 Months

Draft action plan, which is based on draft activities, is presented as follows:



The above draft action plan indicates the estimated preparation and implementation durations regarding the targeted fundamental operations of the project. In order to account for the preparations needed before the project, the action plan will start one month in advance of the project kick-off. The activities planned to acquire envisaged results, and expected outputs are outlined below. The detailed action plan regarding the pilot project will be prepared during the first month of the project, by expert personnel at the Manisa OIZ IC in collaboration with the relevant stakeholders. The project duration planned as 18 months may be extended as a result of the needs which may arise during implementation. In this case, the business plan will be updated with the contribution of all stakeholders. The budget sharing between the Ministry and the Management of the MOIZ will be reviewed.

The project timeline, set for 18 months, can be extended taking into account the requirements that arise during project implementation. In such a case, the business plan will be updated with contributions from all stakeholders and budgetary arrangements between the ministry and the MOIZ management will be reviewed.

1. Structuring of the Innovation Center:
For the first five months, the pilot project will be devoted to the structuring of the Manisa OIZ IC at the minimum required level. The Innovation Center will not have a legal status separate from the Manisa OIZ during the period of the pilot project, however, a project team will be created with one director and at least two experts in order to be able to run the operations required by the project. The pilot project will kick off with the creation of the project team, and it is planned to build the fundamental corporate infrastructure regarding the structure and operations of the Manisa OIZ IC in the first three months of the project. The outputs envisaged regarding the activities to be realized as part of the initial outcome are listed as follows:

- Fundamental operation processes guide
- IT infrastructure
- Communication strategy
- Business model and service tariff regarding services to be presented
- Sustainability strategy

2. Development of innovative capacities of institutions and companies operating in the region:
Starting from the sixth month of the project, all practices directed at improving innovative capacities of the Manisa OIZ and the companies operating within the Manisa OIZ will start to be designed in full detail. The second stage of activities in the pilot project will take four months. Expected outcomes regarding the preparation process are listed as follows:

- Industrial requirements analysis
- Detailed activity plans for the pilot project
- Documented selection criteria for target companies

- List of activity participants

- Service contracts and participation protocols
- Pilot project performance indicators

- Current status parameters of the Manisa OIZ and target companies Manisa OIZ Innovation Center Pilot Implementation Project

In the last month of the four-month preparation period, the activities designed to expand innovation capacities of organizations and institutions will be started. The duration of the implementation period is planned to be 13 months until the last month of the pilot project. Training activities, mentorship support, comparative analyses, matching activities, and contests are planned to be organized within this scope. The outputs that are expected to be obtained as a result of the activities to be carried out are listed below:

- Innovation Capacity and Needs Analysis (1 OIZ + 20 companies)

- Innovative Implementation Plan (1 OIZ + 20 companies)

- Digitalization Diagnosis and Action Report (1 OIZ + 20 companies)

- Innovation Capacity Development Activities Final Report (1)

3. Determination and Improvement of Clustering and Value Chain Potential: One of the most fundamental and important activities of the Manisa OIZ Innovation Center is the clustering of the aggregations observed in specific value chains in the region. As part of this activity, it is planned to prepare an action plan based on the studies carried out on the value chains with clustering potential in the region and to create clustering structures. Within the scope of the preparation period that will start in the sixth month and end in the tenth month of the pilot project, the following outputs are expected to be obtained.

- Value chain maps (2)

- Cluster organization chart (1)

The implementation of clustering activities as a part of the pilot project will be started in the ninth month, and these activities will continue until the end of the project. Within the scope of the clustering activities, at least two clusters are planned to be established within the Manisa OIZ IC in the leading value chains of the region. The desired outputs needed to achieve this expected result are given below:

- Clusters (2)

- Cluster business models (2)

- EU accreditation certificates of the clusters (2)

- Strategic plans of the clusters (2)

The total budget of the Pilot Project is TRY 8 million.

- TRY 4 million, which corresponds to nearly half of the budget, will be provided by the Government Investment Program from the fund

of "Developing a Model to Improve Technology Use in OIZs" jointly implemented by the MoIT and UNDP.

- Approximately the other half of the budget which amounts to TRY 4 million will be funded by the Manisa OIZ.

It is considered that 25% of this portion of the budget can be obtained from the participating companies. The inclusion of the beneficiary companies in the project cost will contribute to shared embracing of the project in addition to financial resource efficiency.

Beneficiaries of the Pilot Project:

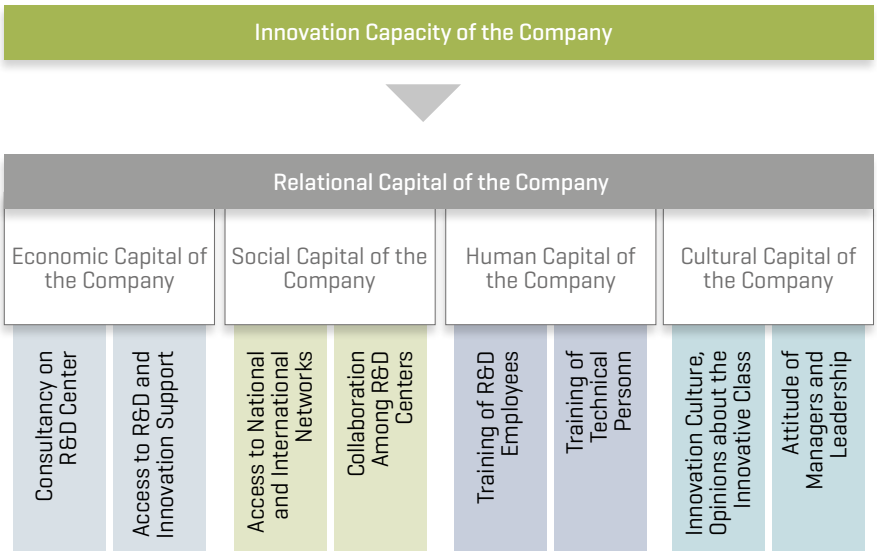
- Manisa OIZ
- Companies operating in the Manisa OIZ

6.2.4 SUPPORTING ACTIVITIES

The human, socio-economic, cultural, and relational components of capital that form the framework of the pilot project define the areas of activity to increase the companies' innovation capacities.

Within the framework of these intervention areas, the pilot project, which is outlined only with its basic activities, will be planned in detail after the project team is created. The aim of this section is to provide a guide for the action plan to be elaborated in the first three months of the implementation process of the project. The activities, which will be performed pursuant to the principles of change orientation, holistic approach, task orientation, and sustainability, are classified within the scope of the components of capital. Figure 8 depicts the positioning of the abovementioned components of capital according to the specific purpose of this project.

Figure 9 **Dynamics of Increasing the Innovation Capacity of Companies**



Increasing the innovation capacities of the companies is one of the basic components of the exclusive objective of developing the regional innovation ecosystem in Manisa. This will primarily be supported by the planned activities for the purpose of improving the relational capitals of the target companies. With the basic objective of increasing the innovation capacity at the center, the planned activities within the project to achieve these results and the services to be provided to the companies can be summarized as the following project actions:

Table 32 Pilot Project Interventions and Services

Human Capital	Training and consultancy services for company-based needs, training activities for developing the skills of R&D and technical personnel
Social Capital	■ Programs for R&D Centers' to establish relationships with the regional and national actors ■ Activities for the companies' internationalization and integration in the global value chains ■ Education, seminars, business network development activities in the Manisa OIZ
Economic Capital	Guiding companies towards relevant government aid and consultation
Cultural Capital	Education, seminars, business network development activities and awareness creation for all companies in the Manisa OIZ
Relational Capital	Identification of company-based needs and creation of innovation strategy/action plan

6.3. Project Components

The Manisa OIZ IC Pilot Implementation Project consists of three components in general.

1. Foundation of the Manisa OIZ IC
2. Planning and Preparation
3. Implementation

6.3.1 FOUNDATION OF THE MANISA OIZ IC

In order for the pilot project to be implemented, the minimum structuring of the Manisa OIZ IC needs to be completed.

- First of all, a director and two specialists will be employed for the IC by the Manisa OIZ.

- The facilities and area needed for the management of the project for the IC will be provided within the Manisa OIZ.

- The IC will be introduced to the companies in the OIZ.

During the pilot project, it is planned that the IC will operate reporting to the Manager of the OIZ/Board of Directors, and its structuring (as a corporation, cooperative, or foundation) will be completed after the pilot project. In the studies carried out, it has been projected that an "Executive Committee" will be established for the pilot project. It is seen to be beneficial that the MoIT, UNDP, Manisa OIZ, the University, Technopark, Zafer Development Agency, and Izmir Development Agency are represented in this committee. This committee will take part in the consideration of requests regarding project activities and work as a decision-making mechanism for the selection process, as well as all processes of the project in general. Due to the limited project period and high number of activities to be carried out, the detailed action plan to be created by the project team will be prepared within two months and submitted for the approval of the "Executive Committee". Once the detailed action plan is approved by the "Executive Committee", the project team will be authorized and responsible for the implementation of the action plan. The project team is responsible for submitting quarterly progress reports to the "Executive Committee". The regional members of this committee will have the opportunity to participate in the Board of Directors or the Advisory Board of the IC whose structuring will be completed after the pilot project.

In addition to the committee, it is proposed to establish an "Advisory Board" with the participation of the industrialists in the Manisa OIZ, managers of large R&D centers, and actors like Manisa Chamber of Commerce and Industry. This board will provide support to the Executive Committee by playing a role in the determination of the industrialists who will take part in the project as well as the needs of the industrialists, and in the identification of service providers that can offer innovative solutions for these needs within the scope of the pilot implementation. It is expected that the Advisory Board will continue to support the activities of the Manisa OIZ IC after the pilot implementation.

6.3.2 PLANNING AND PREPARATION

In the planning and preparation phase, the activities outlined in this document (the activities may

be revised if the priorities change) will be elaborated upon, and an implementation plan will be prepared.

This process will be handled jointly by the Manisa OIZ IC and UNDP-MoIT.

Determination of The Primary Sector and/or Technological Areas and Their Potential Needs

During the first stage, the sector and/or technological areas to be focused on will be determined. In this context, the sectoral dominance in the Manisa OIZ, Turkey's primary areas of policy, and the sectors and/or areas that are open to collaboration and suitable for the project interventions implemented as part of the pilot implementation will be prioritized.

To this end, two or three sectors will be selected from the leading sectors in Manisa such as electronics, automotive supply industry, and others considering the budget limitations. In this selection process, the primary technological areas will be identified if deemed necessary. Some of the areas that gained importance in the digital transformation can be prioritized in this context.

In the next step, it is important to carry out a needs analysis and determine the competitive focus areas. Performing a needs analysis for the selected sectors is necessary for the pilot project to be organized and finalized in a healthy way. Especially keeping the term of the needs analysis medium/long instead of a short-term study, outlining the needs, and creating a vision for the future is of great importance for an innovative and competitive transformation.

On the other hand, due to the limitations on the terms and budget of the project, attention should be paid to the objectives that provide solutions to a defined and resolvable problem, in order for the project to be properly completed in a short period of time.

Within this context, the sectoral analysis studies in Turkey will be examined on top of the literature review, and the most suitable areas in Manisa to make an investment will be identified in cooperation with the representatives of the selected sectors.

Since the identification of the potential needs of these sectors is an extensive and deep matter, it brings several challenges with it. To make this possible, the technological area and the general trends of the sector will be examined in a focused and short-scope study. To this end, the sectoral and thematic trends around the world, in Turkey, and in the Manisa OIZ will be studied.

Identification of the Companies to Be Included in the Pilot Project in the Manisa OIZ

A few general criteria are set for the selection of industrialists to be included in the pilot implementation. The mentioned criteria will be revised and finalized by the Executive Committee after the sectoral and technological area are determined.

The criteria that are stand out in the studies conducted are listed below:

- To operate in the sector/field determined for the pilot implementation,
- To have the potential to make an investment in the future,
- To financially contribute to the project,

- To be willing to take part in the project,

- To hold the capital (cultural, human, social, and economic) needed for innovation.

The industrialists determined will be contacted in individual meetings and informed about the program in detail. In these meetings, the benefits of the pilot project will be explained, and the selected industrialists will be included in the pilot implementation program after the agreement on the human resource, infrastructure, and financial resources to be allocated for this project. At this time, the contribution expected from the industrialists will be determined on top of the project resources to meet the resource needs within the project, and the industrialists will be expected to make a commitment on this matter.

It will be requested that at least one executive from each company is assigned as the change leader (from those working in the related R&D, Production Development, or innovation fields) on the condition that the assigned executive will take an active role throughout the project. The list of employees who will receive training in accordance with the training modules to be identified as part of the pilot project will be requested during the application process as well.

After the company is selected, at least one academic and/or sectoral specialist will be assigned to support and provide consultancy/mentorship to the company in the project. This way, a core project team will be created with the participation of the IC project manager, academic/sectoral advisor/mentor, and the company representative.

6.3.3. IMPLEMENTATION

The Manisa OIZ IC will start the pilot project implementation following the successful completion of its minimum structuring, planning and preparation process.

At this stage, a mapping study for the innovation capacity and a needs analysis will be carried out in detail together with the selected companies. These studies will be performed by the company representatives, the mentor/advisor assigned for the company, the IC team, and other advisors. As a result of these studies, the innovation capacities of the companies selected for the pilot project will be revealed, and a strategy and road map will be prepared accordingly.

The final shape of this strategy and road map will be based on the opinions and resources of the selected companies, and the supporting stage will be started. All kinds of support that each company needs will be provided as a part of the pilot project.

- Consulting services on company weaknesses will be provided based on the need for improving the innovation infrastructure and the capacity of the companies for project creation and implementation. Due to the budget limitations, the companies will not receive direct capital transfers. However, the companies will be supported to improve their capability to access government aid for the purpose of strengthening their innovation capacity and making their application processes easier. This

includes providing consultancy to the companies that hold the potential to become an R&D center.

- In accordance with the needs of the companies, activities will be organized to enable the companies to get involved in various networks by interacting with such units as companies, interfaces, or universities in Manisa, Izmir, Ankara, Istanbul, or other provinces. This will help establish trust relationships by strengthening their networking abilities. With these activities, it is aimed to expand the relational and social capital capacities of the companies.

- Training and awareness activities will be carried out to improve the human and cultural capital of the companies. New programs will be designed especially for technical (intermediate staff) and R&D personnel. In addition, training will be provided for the executives of the companies to improve their innovation understanding and their approach towards R&D and digitalization processes. The aim is to make employees get to know one another better within these organizations and establish stronger connections to contribute to the social capital in return, while the cultural and human capital of the companies is improved at the same time.

- A set of training activities will be designed for all of the companies in the Manisa OIZ in general, in addition to the selected companies. These training activities will mainly be organized as short seminar sessions and will include practical applications rather than theoretical training. These training sessions can focus on the following subjects:

  - Innovation and digitalization
  - The innovative product development process, open innovation methods, test/certification processes,
  - Intellectual and industrial property rights (FSMH),
  - Foreign trade, foreign market analysis and market access channels, market/customer research and confirmation methods
  - Other subjects that the companies may need training on

6.4. Actors and Responsibilities

The Executive Committee will be established in a way to include the stakeholders of the pilot project, namely the Manisa OIZ IC, Manisa OIZ, the companies operating in the Manisa OIZ, Zafer Development Agency, the University (including the Technopark and TTO), Provincial Directorate of KOSGEB, UNDP, and Ministry of Industry and Technology. The Advisory Board of the pilot project will include the Chamber of Commerce and Industry and Izmir Development Agency in addition to these members. The support and contributions expected from the stakeholders during the pilot project are listed below.

6.4.1. MANISA OIZ IC

- Preparing a protocol on confidentiality, conditions of participation in the pilot implementation and responsibilities, and coordinating of the signing process of the protocol by the parties.

- Providing support especially for the identification of strategic areas during the needs analysis.

- Coordinating the needs analysis implementation.

- Providing support in the identification of the related industrialists.

- Coordinating meetings to gather the stakeholders together.

- Establishing communications with interfaces and institutions from Manisa, Izmir, and other provinces in Turkey in accordance with the needs of the project stakeholders and coordinating such communications.

- Providing mentorship throughout the process.

- Providing training and consultancy services to support the project coordination and innovative processes.

- Meeting the spatial needs of the project stakeholders and enabling the project stakeholders to gather on a regular basis.

6.4.2. MANISA OIZ

- Representing the IC in and outside the OIZ during the project and acting as an integrated body by coordinating the activities at a corporate level.

- Providing all kinds of support, mainly financial, until the IC completes its minimum structuring and institutionalization and has a sustainable revenue flow.

- Contributing to the expenses of the pilot project.

- Helping the IC complete its establishment process and provide services to the companies.

6.4.3. UNIVERSITY, TECHNOPARK, AND TTO

- Supporting the minimum structuring of the IC.

- Contributing to the process of measuring the innovation capacities of the companies and performing their needs analysis.

- Supporting the companies to access all kinds of information which they may need.

6.4.4. COMPANY/INDUSTRIALIST

- Providing the IC with all kinds of support within the company and establishing an active collaboration.

- Making a contribution of 25% to the cost that will be spent for the company within the project.

- Complying with the implementation schedule of the project.

6.4.5. KOSGEB PROVINCIAL DIRECTORATE

- Informing companies regarding KOSGEB supports.

- Evaluating companies' R&D and technological investment support projects and utilizing the most optimal programs.

6.4.6. ZAFER DEVELOPMENT AGENCY

This is the most crucial stakeholder which can provide technical support and critical financial support in certain areas.

- Providing coordination at regional level.

- Providing experience and intellectual contribution at the pilot implementation stage and holistic support at implementation stage.

6.4.7. UNDP

- Providing project management and coordination.

- Timely provision of financial requirements of the pilot project.

- Providing support for fulfilling the domestic and international business network requirement.

- Planning for and concluding all types of needs analyses.

- Coordinating stakeholder selection and operating consequent processes.

6.4.8. MoIT

- Financing and implementation of the pilot project.

- Providing coordination required at international level.

6.5. End-of-Chapter Review

The current status assessment, needs analysis, stakeholder workshop, strategy and roadmap documents have all been prepared for the Manisa OIZ. This pilot project was prepared based on these works.

The objective with the pilot project is to complete the minimal level of structuring needed for the establishment of the IC and improving innovation capacities of the companies included within the project. The IC will improve the corporate capacity of the Manisa OIZ, therefore contributing to its transformation into an innovative OIZ, meanwhile working to improve innovation capacities of companies selected for the pilot project. At the same time, the IC team will better understand the Manisa OIZ, companies and the ecosystem present in the region, gaining relevant experience for final structuring of the Manisa OIZ. The total project budget is TRY 8 million and the project duration is estimated to be 18 months.

The expected outcome of the project is defined as "The transformation of the MOIZ into an innovative OIZ, and therefore the improvement of the national and international collaboration capacity of the Manisa Regional Innovation System".

The most critic al pillar of the project is for the companies who are selected for the pilot project to trust the IC and fully collaborate with the project activities. Hence, due diligence and patience is needed in the process of building relationships of privacy and trust with these companies.

CONCLUSION

Manisa OIZ
Power Plant

The fundamental objective of the "Developing a Model to Improve Technology Use in OIZs" is to transform the OIZs in Turkey, which were structured as per Industry 2.0 and the productivity economy, into an innovative and new-generation organizations. The Manisa OIZ was selected as pilot region for this objective.

The current status assessment, needs analysis, stakeholder workshop, strategy and roadmap documents have been prepared for the Manisa OIZ and the pilot project was prepared based on these resources.

This publication, which comprises a general starting point for transformation of OIZs and a specific source to establish an innovation center in MOIZ, is a first-stage work. In this framework, the Manisa OIZ was studied in detail, and consequently appreciated as the first and a Pilot Implementation for the Developing a Model to Improve Technology Use in OIZs.

The province of Manisa did not undergo a significant change in terms of socio-economic development since 2003.

The progress that the Technopark has made and the foundation of the TTO in the recent years demonstrates that there is an increase in activities aiming for university-industry collaboration. However, other than its central lab, the university still lacks advanced capacity to offer high level services to the industry.

On the other hand, it is possible to see some of the exclusive tests, analysis, technology and product development projects brought in to the Technopark via guided projects endorsed by the Development Agency as crucial steps towards improving university-industry collaboration.

Manisa has 32 R&D centers. While it is still important to increase the collaboration and communication of R&D centers among themselves and with other actors of the innovation ecosystem, there are significant gaps in information sharing, participation in national and international project markets, joint project development, pre-competitive collaboration and especially in commercialization. Meanwhile, R&D centers generally intend to organize themselves in Manisa. There is no cluster project in Manisa that is supported by the MoIT. However, the Ministry of Commerce has endorsed the Automotive UR-GE Project in Manisa. It is crucial to monitor, in the medium term, that the projects materialized at the Technocity with support from the Development Agency take effect in the private sector in terms of technology, production, and organization among companies-institutions, and transform into a capacity that will support a defense industry and/or electronic cluster, and that the IC adopts a strategy which is in line with these developments.

Setting up the IC as an interface and catalyst for the industrialists and seeking common goals and strategies with the other interface institutions, Technocity, TTO, and the Development Agency as the coordinator institution would be optimal.

According to EIS data, it can be said that;

(i) technologically, Manisa's production has shifted away from high technology sectors, towards medium-high and medium-low technology sectors and Manisa has not achieved a progress compared to Turkey in terms of the innovation and R&D indicators,
(ii) companies demonstrate a tendency to shrink in terms of the number of employees,
(iii) in terms of R&D and innovation activities, high technology sectors are experiencing a reduction in R&D activities, companies in medium-high and medium-low technology sectors are embracing different strategies, for instance, while some companies are more intense with their R&D expenses, hoping to gain competitive power, others pursue a productivity and price-focused competitive strategy without any R&D work.

Along with these findings, it is possible to observe that the industrial organization as well as the repositioning of companies in the value chain provide some clues as below.

- A majority of Manisa companies, especially those in the high and medium-high technology sectors are struggling to achieve development that is in parallel with technological developments.

- There are two fundamental reasons for the fact that the kilogram value of the products exported at industries with medium-low technology has risen considerably. The first is the increase in companies' R&D and innovative capacities. The second reason is that companies gradually started targeting overseas markets, which prompts them to invest in manufacturing standards and technologies and consequently creates value increase.

- Large companies operating in the MOIZ, which utilize considerable technology and innovation capacity, currently have limited skills in terms of information dispersion, R&D and innovation capacity dispersal to relatively smaller companies and creation of diversity and impact. Increasing this effect will enable development of the innovative capacity in the region.

- In parallel with these assessments, Manisa is specialized in relatively lower technology sectors in the Manisa-Izmir trade relations.

Manisa OIZ has won the hearts of industrialists not only with its infrastructure but also with the services it provides, and it is among a few leading OIZs in Turkey in terms of services for the productivity economy. Within this scope, social facilities, together with activities in terms of kindergarten, training, occupational training, logistics, electricity, water, natural gas and IT infrastructure are highly favored by participant industrialists.

On the other hand, the tools and actors of the regional innovation system like TTO, technopark, business incubator, common R&D center, common R&D lab and common test and analysis lab do not exist in the OIZ.

Discussions were held in the workshop, which provided rich content in terms of the fundamental matters regarding establishment of the IC, and the following matters came into prominence.

- Quite a high level of embracement was observed from the Manisa OIZ Management, participants, the university and public chairs when considering the IC.

- The capacity of companies to employ the services provided by the Innovation Center should be investigated. While doing this, both the transformative and problem-solving functions of the Innovation Center should be used together.

- The business and management plan for the IC must be prepared in a way that it will comprise of the center's agenda specifically for the "first 100 days" and "for the first three years", while setting clear objectives. Also, it will be useful to include the Director of the Innovation Center in such processes.

- It is concluded that the following processes will lead us to successful results: the innovation center will be established with the vision of "transforming industrialists in a competitive manner by spreading the culture of innovation and value creation" as a small, flexible and agile structure by evaluating the corporate and cooperative status.

- The areas and subjects of activity will be identified in consideration of both Manisa and Izmir-Manisa urban regions as a whole.

- A close relationship will be established with the Manisa OIZ (at least in the short term) and partnerships with structures such as development agencies, TUBITAK, universities, technoparks and TTOs will be developed.

- Qualified personnel in different specialties and functions with strong communication skills will be employed.

- The establishment process will be completed successfully and good relations with stakeholders will be established in the short term. In the medium term, the Innovation Center will be professionalized and will become systematic and diversify its services and start generating its own revenues.

- The communication strategy will focus on complementarity, collaboration and shared benefits by reinforcing the trust element in a way to support the corporate strategy in the short term. In the medium to long term, it will contribute to the vision of the industry and the city, and to the value created on this ground in parallel with the influential position of the Innovation Center in the ecosystem.

In addition, it is considered that the choices to be made regarding the strategic positioning of the Innovation Center in a way that will affect every aspect of the establishment and development of the Center are of great importance.

■ **Strengthening the Connection with Izmir - Joining the Izmir Networks:** In the region, the role of Manisa in production and Izmir in trade and design will determine how to attract the attention of creative individuals to the region and the position to be taken in urban marketing. Izmir has immense resources that are easily accessible for the Innovation Center's activities. There are mentors, experts and structures like universities, technoparks, R&D infrastructure and TTOs, which the Innovation Center can reach out to and collaborate with.

■ **Focusing - Specialization:** In addition to the Manisa ecosystem, identifying the areas that can create competitive advantages within the Izmir ecosystem and become integrated with Izmir will also provide the Innovation Center with the opportunity to create resources for and to provide services in Izmir. In this way, the Innovation Center will have the opportunity to diversify and scale services effectively not only in Manisa but also in Izmir, in the areas where it specializes and has a competitive advantage.

It was projected that the center would operate as a self-supporting and complementary structure, in relation to and in communication with other actors within the innovation ecosystem rather than being a single structure. It is rather important for companies to identify their needs and to form the legal basis for a trust environment that will enable information flow for the management of big data.

The importance of determining the missing links in the production value chain in the region, inviting and encouraging the enterprises and investments in the areas where current sectors can generate more added value and making smart investment promotions was emphasized.

Instead of focusing on a single sector, it would be useful to focus on digital technologies like design technologies, robotic technologies, cloud technologies, software, smart specialization and clean technologies in a different approach, intersecting together with all sectors. It is considered that this approach can be put into practice in the medium-long term for the positioning of the Innovation Center.

The methods of impact evaluation analysis for such a structure established using public resources should be simultaneously researched.

The findings of the needs analysis are summarized below:

■ The Manisa Regional Innovation System (MRIS) currently conducts its activities within the framework of the innovation economy. However, 32 companies established their R&D centers, and some of them started their innovation activities with several TUBITAK projects. Especially with the impact created by Vestel and other large companies, contractors and suppliers at the lower part of the value chain continue their efforts and pursuit for the sake of innovation, design, and quality development.

- When performances of MRIS actors were evaluated, the highest scores were given to Zafer Development Agency, Manisa OIZ and Manisa Technopark, respectively. MRIS actors' corporate capacity and collaboration capability need to be improved.

- The potential areas of priority for the IC to intervene were determined as skills improvement and innovation. These are followed by business development and coordination. Due to the Manisa OIZ companies' operating both in the areas of productivity and innovation economy, this may have played a role in participants' prioritization of skills improvement and innovation.

- In terms of skills development, two activities were emphasized. The first skill is to develop the network abilities and sense of trust of the actors. The second activity is to improve the level of capabilities and skills of the intermediate staff working in the industrial zone and R&D personnel.

- In terms of innovation, it was seen beneficial to expand the R&D, innovation, entrepreneurship, and digitalization capacity of the industry, to provide consultancy to companies for this purpose, and to prepare needs analyses and road maps. In addition, simplifying access to government aid for the companies in the Manisa OIZ, directing the companies to initial R&D aid in particular, carrying out activities on writing projects to enable such aid, and raising awareness of the company employees were identified as the needs. It was also projected that the number of R&D centers in the Manisa OIZ could be increased, and the companies with this potential could be provided with the necessary training and consultancy.

- For business development activities, joint project development and implementation were focused on. The most important activities in this field are to establish a platform where industrialists and technology-based entrepreneurs come together and to develop joint projects based on specific needs. R&D centers play an especially important role in this respect. It is considered that the current platform that is established between R&D centers is rather suitable and improvable for business development.

- For coordination, it was projected to establish a mechanism that would have the necessary information on Manisa, Izmir, and other cities in Turkey, as well as on the international arena, to enable the actors in the MRIS and the industrialists the ability to access the information.

- Partnership is another subject that needs to be considered thoroughly. In this regard, opinions supporting the idea of establishing an advisory board, in addition to an independent management structure in the Manisa OIZ IC gained importance. The organization of the Manisa OIZ IC in a corporation status is another subject that was considered important. It was concluded that the alternatives of establishing the center as a cooperative or corporation could be considered after the pilot project to be implemented on this matter.

- It was seen as necessary for the Manisa OIZ IC to have human resources with the capabilities required to fulfill its functions. A mentor pool needs to be created to include more experienced individuals who may provide guidance in the projects in addition to the full-time employees.

- The projection suggesting that the Manisa OIZ IC will be able to cover all of its expenses with its own revenue is what the IC is predicated upon. The structure, which is to be established with government aid and financing from the MOIZ, is expected to be able to finance itself in the future.

- It is considered that the IC may be located in the management building of the MOIZ while the place where it will conduct its activities is established, and later on, may be moved into a location where it will be with other structures planned to be established within the MOIZ like the incubation center, technopark, common lab or evaluation center depending on its performance and success.

In line with the stakeholders' opinions and expectations regarding the center, the strategic framework and action plan are both designed in a way that is capable of being integral among the current institutions and interfaces, and addressing the transformation, development and growth needs of the industry.

Main subjects that are evaluated in the SWOT analysis are the capacity of the Manisa OIZ and the ecosystem institutions; production, brand, and innovation capacities of the companies; collaboration opportunities in electronics, automotive, and information sectors; risks that may be caused by digital transformation, and Manisa's social and human capital driven by the workforce from Izmir.

Considering the strategic evaluation of the analyses carried out in the study and the opinions of the stakeholders in Manisa regarding the IC, a strategic framework for the establishment and operation of the IC has been prepared. Actualization of the IC involves the gradual establishment of a center by means of short-term minimal structuring of the center, and the design of the pilot implementation project.

In the medium term, the IC's foundation is predicted to be entirely complete. Over time, the IC is expected to become one of the key elements of the Manisa OIZ and RIS by institutionalization and to become integrated with the main elements of the ecosystem.

In the long term, it will maintain its operations towards the primary needs of companies in areas of skills development, collaboration, innovativeness and coordination, in order to advance the Manisa OIZ companies' capacities in innovation and digitalization.

The objective with the pilot project is to complete the minimal level of structuring needed for the establishment of the IC and improving innovation capacities of the companies included within the project. The IC will improve the corporate capacity of the Manisa OIZ, therefore contributing to its transformation into an innovative OIZ, meanwhile working to improve innovation capacities

of companies selected for the pilot project. At the same time, the IC team will better understand the Manisa OIZ, companies and the ecosystem present in the region, gaining relevant experience for final structuring of the Manisa OIZ.

The total project budget is TRY 8 million and the project duration is estimated to be 18 months.

The project consists of three stages

(i) Establishment of the IC

(ii) Programming and preparation: There will be two levels of activities; one at the general OIZ level and one at specific company level and detailed activities regarding the subjects and areas specified in this research will be determined. The design regarding the programs planned to be implemented will be completed and the participant companies will be determined.

(iii) Implementation of activities directed at improving innovation capacity and skills both at the OIZ and company level.

The project will be realized by the Manisa OIZ IC and UNDP under the leadership of the Ministry of Industry and Technology. In addition, the Manisa OIZ, the University, Technopark, TTO, Development Agency, and KOSGEB Provincial Directorate will participate in the Guidance Committee of the project.

The most critical pillar of the project is for the companies who are selected for the pilot project to trust the IC and fully collaborate with the project activities. Hence, due diligence and patience is needed in the process of building relationships of privacy and trust with these companies.

As a result, the "Developing a Model to Improve Technology Use in OIZs", which saw active support for and participation in their activities by the Presidency of Strategy and Budget, and operated in collaboration by the Ministry of Industry and Technology and UNDP Turkey, has gained significant importance at the strategic level, followed by its transition into the pilot project stage. The environment needed to transform the Manisa OIZ into an innovative OIZ was created as a result of this work. In the upcoming period, in the light of the lessons to be learned from this pilot implementation, similar works will be performed in different OIZs for the transformation of OIZs and the companies within them into innovative organizations. A programme is planned to be designed for the works to be done by the Ministry of Industry and Technology with co-financing of the participating OIZ, and the legislation that will provide basis to this program is still under development.

In the coming period, given the lessons learned from this pilot study, similar studies will be conducted in different OIZ's to ensure that OIZs and their companies turn into innovative organizations.It is planned to design programs for the project that are co-financed by Ministry of Industry and Tecnology and related OIZs. Studies are currently underway on the legislation that will form the basis for the program.

Powered by public will and resources, the capacity, awareness and support (financial and human resources) of the MOIZ, the willingness of companies and their belief in the project, and this technical work, the pilot implementation will come to life.

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ANNEX-1: SEMI-STRUCTURED INTERVIEW QUESTIONS

1. Considering Manisa's regional ecosystem (innovation system) what are the most important areas of problems in terms of entrepreneurship and innovation? If you were the decision maker, what would you do in these areas?

2. How strongly do you agree to the statement "The institutions operating in Manisa, as mentioned below, are successful"? Why? What are the key problems?

Institution/Opinion	I Strongly Disagree (1)	I Mostly Disagree (2)	I'd Rather Disagree (3)	I'm Neutral (4)	I Somewhat Agree (5)	I Mostly Agree (6)	I Strongly Agree (7)	Not Informed (8)
Technoparks								
Incubation Centers								
TTOs								
Research Infrastructure								
OIZs								
Clusters								
Chamber of Industry								
Chamber of Commerce								
Development Agency								
Directorate of KOSGEB								
Local Administrations								
TTGV								
Industrialist								
Tech-Entrepreneur								

3. What do you think of the Innovation Center that is planned to be established in Manisa? What do you think this center should be doing? What shouldn't it do? What must the general functions of Innovation Centers be?

4. What areas do you think the Innovation Center should focus on? What should its primary topics be? Why?

5. Please fill in the table with numbers 1 to 7, with 1 being the least important and 7 being the highest priority.

Institution/Opinion	I Strongly Disagree [1]	I Mostly Disagree [2]	I'd Rather Disagree [3]	I'm Neutral [4]	I Somewhat Agree [5]	I Mostly Agree [6]	I Strongly Agree [7]	Not Informed [8]
Skill Development Human Resources								
Business Development (i.e. Project development, Collaboration Development, Network								
Coordination (i.e. Information Map, TTO/Technopark/Research Center and Information Transfer Between Companies)								
Innovation (i.e. Collaborative R&D Development, Technology Evaluation and Valuation, Commercialization, Strategy and Matching, Access to Platforms, Technology Roadmap, etc.)								
Attracting the Innovative Class to the Region, Reducing Qualified Migration								
Developing Clusters and Collaboration Between Clusters								
R&D Centers, Open Innovation Activities and Collaboration								
Capacity Building for the OIZ, Technopark, TTO and Research Center								
Improving Collaboration Between Companies (Industrialists and Tech-Entrepreneurs)								
Choosing a Sector								
Choosing a Sectoral Group (Priority on High-Medium and High Technology)								
Choosing a Technological Area								
Companies That Develop Rapidly or Have a Potential to Develop Rapidly								
Other:								

6. Can you share a vision, an objective and a strategy for the Innovation Center?

7. How should the organization structure and human resources of Innovation Centers be?

8. How should Innovation Centers be financed? Why?

9. How should the relationships of Innovation Centers with technoparks, TTOs, the university, OIZs, private sector, regional administrations, government bodies and NGOs be at the corporate level?

10. How should the partnership structure of Innovation Centers be?

11. Where and how should the Innovation Center be located? Why?

12. Who and what institutions does this project pose a risk for?

13. Who will embrace the Innovation Center?

14. Do you have anything else to add?

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LIST OF ABBREVIATIONS

EU	: European Union
ABYS	: Ankara Regional Innovation Strategy
R&D	: Research and Development
ASELSAN	: Military Electronics Industry
RIS	: Regional Innovation System
EC	: European Commission
FSMH	: Intellectual and Industrial Property Rights
EIS	: Entrepreneurship Information System
GDP	: Gross Domestic Products
SWOT Analysis	: Strengths and Weaknesses, Opportunities and Threats Analysis
INSEAD	: European Institute of Business Administration (Institut Européen d'Administration des Afaires)
SME	: Small and Medium Sized Enterprises
KOSGEB	: Small and Medium Enterprises Development Organization of Turkey
MRIS	: Manisa Regional Innovation System
OECD	: The Organisation for Economic Co-operation and Development
OIZ	: Organized Industrial Zone
MoIT	: T.R. Ministry of Industry and Technology
NGO	: Non-Governmental Organizations
SRM	: Strategy and Road Map
TEKMER	: Technology Development Center
TF	: Design Factory
TDZ	: Technology Development Zone
THY	: Turkish Airlines
TTGV	: Technology Development Foundation of Turkey
TTO	: Technology Transfer Office
TUBITAK	: Scientific and Technological Research Council of Turkey
UNDP	: United Nations Development Programme
UR-GE Project	: The Project for Endorsement of Development of International Competitiveness
WEF	: World Economic Forum
WIPO	: World Intellectual Property Organization
IC	Innovation Center

Manisa Industrial Park
Sheltered Workshop for the Mentally Disabled Life Center


E SANAYİ BÖLGESİ
AM MERKEZİ


GANIZE SANAYİ BÖLGESİ
.L. YAŞAM MERKEZİ
DUSTRIAL PARK SHELTERED
OP FOR THE MENTALLY
ABLED LIFE CENTER

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Manisa OIZ Innovation Center's Design and Foundation

The project "the Developing a Model to Improve Technology Use in OIZs", which is implemented in collaboration with the Ministry of Industry and Technology and UNDP and supported by the Presidency of Turkey, Presidency of Strategy and Budget, aims to contribute to the transformation of OIZ policies and implementations undertaken successfully up to the present into more innovative organizations in parallel with the R&D, innovation, entrepreneurship and digitalization aspects emerging in the world and in Turkey. Within this scope, an innovation center is planned to be established within the OIZ in Manisa which has been selected as one of the pilot regions. For a better structuring of the "Innovation Center in MOIZ", an 18-month long implementation program with SWOT analysis, key strategies and a roadmap was prepared based on the current situation assessment, stakeholder workshop and needs analysis. Therefore, it is aimed to contribute to both the transformation into an innovative OIZ and the development of the innovative capacity of the companies within the region. It is believed that this study will be a milestone in terms of transformation of OIZ's and will be beneficial to the whole entrepreneurship and innovation ecosystem.

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