Türkiye's Smart Cities e-Workshop
"Esenler"

MAY 12, 2020
FINAL REPORT

BİLİŞİM VADİSİ | Technology Development Zone.

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Technology
Development
Zone.

Türkiye's Smart Cities e-Workshop
"Esenler"

Organizing Institutions:
Ministry of Environment and Urbanization
Ministry of Industry and Technology
Esenler Municipality
MARKA
TÜSSİDE
Bilişim Vadisi

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This workshop was held online and was conducted without all participants coming together physically.

REPUBLIC OF TÜRKİYE
MINISTRY OF INDUSTRY
AND TECHNOLOGY

REPUBLIC OF TÜRKİYE
MINISTRY OF
ENVIRONMENT AND
URBANIZATION

MUNICIPALITY
of ESENLER

Türkiye's Smart Cities e-Workshop "Esenler"

#WeCanTogether

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e-Workshop Presentation

The priorities of smart applications in cities may change depending on the main constituent/criterion/indicator groups, which can be collected under the titles of economy, social, cultural, environmental, educational, executive of the city, and so forth, and subcomponents/subcriteria/sub-indicators.

Therefore, during the transition process to smart applications, the determination of the priorities of the city is important in terms of defining the right and sustainable applications.

However, determining the priorities of the city should not be considered enough on its own as a router.

The readiness of cities in terms of human resources, technological infrastructure, and organizational necessities is as important as determining priorities in the initiation and maintenance of smart applications.

Benefiting from expert opinion is as important as field work, desk-bound literature, and technical work in creating phased progress within the mentioned scope.

Expert opinion, which is wide-ranging and includes representation of different sections, is highly important in terms of conduction through cumulative experience, describing the work that needs to be conducted and achieving highly fruitful results.

Asking for expert opinion and getting the importance-priority rank by digitizing the opinions, which is a technique used in multi-criteria decision analysis, has been a popular and accepted approach for 20 years.

The foreseen Workshop is the exemplification of the multi-criteria evaluation process within the scope of the study conducted.

focusing on Esenler. Within the scope of the study conducted focusing on Esenler, the opinions of experts were asked and specific results were obtained. In the Workshop, it is aimed to open the priorities in question up for discussion with the representatives of the sections which are actively taking part in smart city applications, and describe the different opinions and expectations. Besides, as mentioned above, it was planned to evaluate the readiness situation.
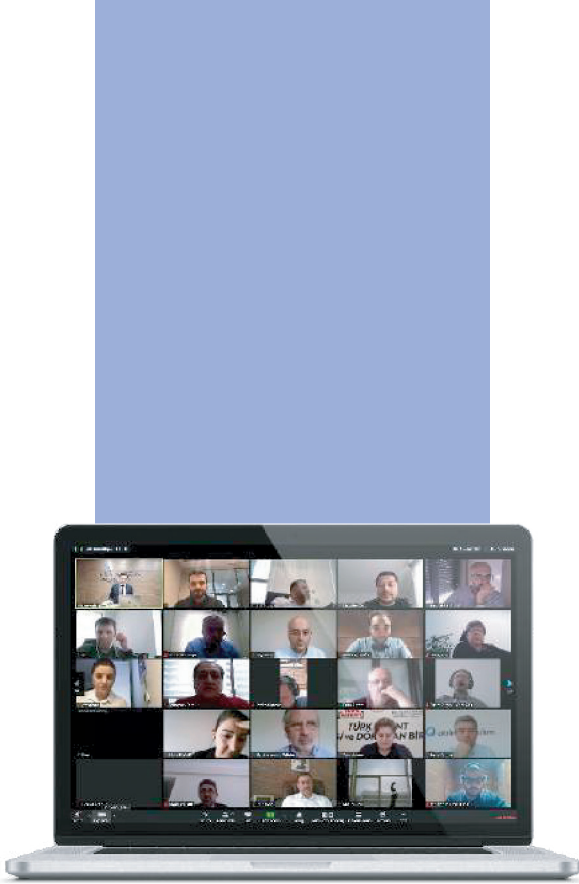
Before switching to the sections of the Workshop, Honorable Esenler Mayor Mehmet Tevfik Göksu, Honorable Deputy Minister of Industry and Technology Mehmet Fatih Kacır and Honorable Deputy Minister of Environment and Urbanization Fatma Varank made their opening speeches.

In the first session of the Workshop, which was held as two sessions, it was aimed to focus on the evaluation of smart city ecosystems, and the readiness situation with our technology production without external dependency.

In the second session of the Workshop, it was aimed to focus on the evaluations regarding the technical infrastructure and application processes based on the study conducted focusing on Esenler.

Türkiye's Smart Cities e-Workshop "Esenler"

REPUBLIC OF TÜRKİYE MINISTRY OF INDUSTRY AND TECHNOLOGY

REPUBLIC OF TÜRKİYE MINISTRY OF ENVIRONMENT AND URBANIZATION

MUNICIPALITY of ESENLER

About Participant Profile

The E-Workshop was held on 12.05.2020 with the theme of "Türkiye's Smart Cities" specific to Esenler Municipality with the organization of Bilişim Vadisi took place with the deep interest of our stakeholders and 200 participants contributed by taking place in the workshop process.

51% of the participants consisted of the managers and directors of public institutions, national and international companies, and 39% consisted of R&D companies and public institution experts (Ministry of Industry and Technology, Ministry of Environment and Urbanization, Esenler Municipality, TÜBİTAK TÜSSİDE, MARKA, National and İnternational R&D companies), and 9% consisted of research assistants. Focus group meetings were held under the titles of Smart Health, Security, Structure, Human, Economy, Environment, Energy, Transportation, Disaster and Emergency, and Management Mechanisms. Deep interest was shown.

Katılımcı Profili

39%
Expert

9%
Research Assistant

52%
Manager, Director, Founder

A total of 200 people participated in the workshop held by Bilişim Vadisi where the model of Esenler, in which the first smart city and mobility application center will be established, was discussed. When the participant profile is examined generally, it can be seen that it consists of national and international companies' senior managers.

26%
Public Institute

23%
International Company

51%
Domestic Company
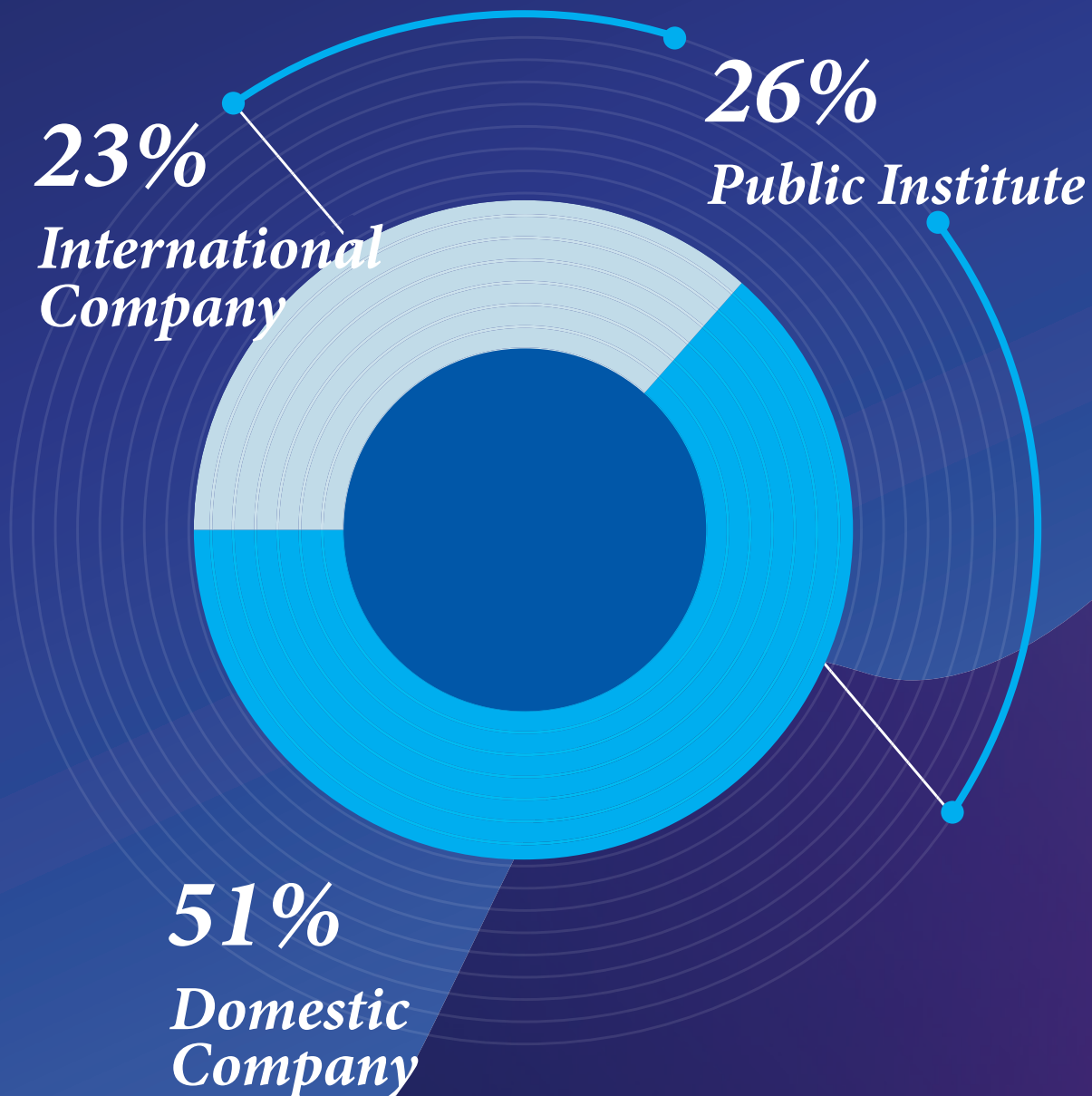
e-Workshop Opening Speeches

e-Workshop Opening

Mehmet Tevfik GÖKSU
Mayor of Esenler

"We would like to put forth a city vision that demonstrates the perfection defined by Farabi, the hope put forth by Galileo and abolishes the fear.

For the whole speech, you can click here or scan the QR code

Fatma VARANK
Deputy Minister of Environment and Urbanization

> We are active and productive in such events and meetings because as the Ministry we developed our Smart Cities strategy.

For the whole speech, you can click here or scan the QR code

Mehmet Fatih KACIR
Deputy Minister of Industry and Technology

> I believe that Esenler Smart City Project will be the source of pride in Türkiye, with the contribution of three stakeholders.
> Esenler will be a base where domestic and national technologies necessary for the smart cities in line with our National Technology

For the whole speech, you can click here or scan the QR code

Türkiye's Smart Cities e-Workshop "Esenler"

1ST SESSION

1. 1. What should be the main component(s), sub-component(s), and technological systems primarily used in the fields that will create wide social impact, such as human health, security, disaster and emergency management, and structures in defining the right and sustainable applications when a Smart City is designed?

First of all, a healthy infrastructure should be constituted. To make a BigData analysis, data (social data, white table data, bill data, and sensor data) can be collected. Also, it will be beneficial to use videos for data processing and analysis.

When these components are created, self-sufficiency should be considered, and domestic and national technologies should be developed instead of imported technologies. Increasing domestic cloud applications can be an example. Programs and platforms that will allow the holistic analysis and synthesis of all the data collected.

will be an important skill.

All the systems that will be established should be integrated with each other and developable structures. New generation technologies should be applied compatible with current technologies and safely, with backup.

Relating to humans, free internet access in public domains, Kiosks, free digital platforms, free education and mass cultural events will be on the agenda more with smart cities. In smart cities, people will be constantly online through their mobile devices. Therefore, establishing Wi-Fi throughout the entire city is important.

> When designing smart cities, education is at the forefront as well. It is necessary to equip people with skills, provide social support, and establish a system of education according to the personal development, needs and changes in people. For example, digital literacy will be an important skill.

When smart city studies are conducted, the participation, governance, technology and informatics literacy and educational status of the people who live there should be considered as well. To ensure the adaptation of users to smart city platforms, training centers should be established.

The usability tests of the smart city applications that will be used should be performed for different groups of age. These technological developments should appeal to everyone (disadvantaged people, notably the elderly and people with disabilities, veterans, and martyrs).

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, and establish a system of education according to the personal development, needs and changes in people. For example, digital literacy

For human security, especially in emergency situations, backed-up structures that will support wireless access should be constituted. Providing free access to these applications will allow everyone to benefit.

The applications developed should be designed to be user-friendly and suitable for improvement. When these systems are developed, users should be involved in the designing process. In other words, technology should be reduced to the public.

In the healthcare field, components such as remote patient follow-up, follow-up of chronic patients, and a panic button should be constituted.

Smart measurement of air and water purity, which affects human health, and taking precautions is essential. Heat and intensity maps can be constituted. Diagnosis and follow-up mechanisms such as thermal measurement systems, video analytics-based systems, and

numeration and analysis systems can be used in the healthcare field. Usage of wearable health technologies (necklace, ring, watch, mobile applications, etc.) should be considered as well. All the data collected in a smartwatch and other equipments should be connected to the E-nabiz system and interpreted.

In terms of security, the following components shall be beneficial: monitoring the city 24/7 through security cameras, analysis of the recordings, and social media analysis. Cybersecurity applications should be generalized and structures should be established to detect and eliminate security holes. Communication should continue in any situation. For that, the energy infrastructure of the city should be strong and backed up. For people to continue living a safe life, security information should be constantly analyzed.

In the disaster and emergency management area, components related to mobile warning mechanisms and early warning systems will gain importance through smart platforms. Disaster scenarios should be studied in detail, and accordingly, related scenarios should be tested by using artificial intelligence algorithms.

Studies should be conducted on posts at the earthquake assembly areas. Smart posts can be used in safety and disaster management fields. Seismic isolators should be used in the design of earthquake-resistant structures.

Post-disaster, to meet the energy and informing needs, solar-powered smart city furniture should be used.

In the structure field, green, next-generation smart buildings will be among the components of smart cities. Smart traffic applications can be an example of this.

For fast internet, a fiber communication spine can be constituted and generalized. Innovative sensor technologies should be evaluated in smart city concepts.

Traditional wiring systems are used in infrastructure establishments, and renewing them costs more for the national economy. At this point, solution methods such as "gallery systems" can be used. Within the current gallery system, services such as gas, electricity, communication, and wastewater should be included. Managing these systems from a single center will be beneficial. With the gallery system, the safe transportation of infrastructure services can be provided and also renewal costs (such as excavation work) can be reduced. Another advantage of using fiber optics is the collection of seismic data. Fiber optic cables can detect physical changes around themselves.

Main Components

— IT Infrastructure
— Geographical Information Systems
— Wearable Technologies
— Mobil Applications
— Camera Systems
— Data Security Softwares
— Sensor Systems
— Satellite and Remote Sensing Technologies
— e-Learning

Subcomponents

— Communication
— Internet of Things (IoT)
— BigData
— Smart Cities Governance Platform
— Cyber security
— Air, Voice, Heat, Moisture Sensors
— Face Recognition Systems
— Image Processing and Video Analysis
— Center-Channelled Mobile Applications
— Patient and Elder Follow-Up Systems
— Disaster and Emergency Management Systems

1.2. What should be the main component(s), sub-component(s), and technological systems primarily used in the fields that will create wide economic impacts, such as economy, environment, energy, transportation, and governance mechanisms in defining the right and sustainable applications when a Smart City is designed?

The first main component is equipment. There might be hardware differences that will be used in different fields. Hardwares should be selected and used for every sector and field. How to make sense of the data obtained from hardware should be taken into consideration.

Sustainable structures in terms of the economy, environment, and transportation should be built. What was produced in the economic and transportation sections, and what benefits were obtained, should be analyzed in detail within

Start-ups, small-size companies, and e-commerce platforms should be supported.

the scope of smart cities. Start-ups, small-size companies, and e-commerce platforms should be supported.

For joint resource usage, common data sharing should be arranged in legal terms and a legal infrastructure should be constituted. It will be correct for the raw data collected from smart city applications to be processed and proceed with the need assessment of the clients and strategic inferences.

In order to ensure resource productivity, the following are necessary: The production of the products that will be used in smart cities in the technology development zone there and the development of a construct that will ensure that employees live in the same place.

Supporting new enterprises in the economic field and popularizing electronic payment infrastructure is important. Applications in vertical and urban agriculture can be reviewed in terms of the economy.

It is seen that big data, artificial intelligence, wireless technologies, and 5G technologies will be more effective in the economy in time. The systems that telecom operators will transform to ensure service diversity may come on the

agenda soon. By using blockchain technology, official transactions in terms of the economy can be made remotely.

In the environmental field, studies should be conducted on the fields of waste collection and recycling systems, treatment facilities, energy generation from waste in these facilities, recycling, and zero waste. Within this scope, it is important to increase recycling awareness and reduce the carbon footprint. For example, England is making air and carbon measurements by placing sensors on pigeons.

Entrepreneurs should be guided to projects about the environment. The data that cannot be reached prevents healthy evaluations. The development and integration of domestic softwares are quite important.

For a clean environment, garbage collection with a vacuum system should be constituted.

It is important to build rainwater harvesting (storing the water in parks or gardens of sites, and using it in watering, etc.) and gray water management to increase the energy efficiency of public buildings.

Street lighting systems that open and close and adjust the amount of light according to sunlight, smart watering systems, and solar panels are among the important components. Smart systems that allow the meters to be read remotely. There can be differences in the measurements made with a mechanical meter and a digital meter. For example, not being able to measure water consumption data correctly may negatively affect the economy. With similar integrations, smart systems will give us warnings about our water consumption. In the meantime, the readings of electricity, water, and natural gas meters should be from a single center.

The construction of positive energy buildings that will allow every building to partially or fully generate the energy they need is crucial in terms of both the economy and the environment. Within this scope, green building certification systems can be established.

The establishment of systems that are self-sufficient and can transfer the redundant, the measurement of energy efficiency of these systems, and making progress with the aim of energy saving are crucial in terms of economic impact.

In our country with four seasons; incentive mechanisms for the evaluation of alternative energy sources such as sun, wind, etc., and the generation and distribution of the most suitable energy according to the geographical features should be established.

Central heating and cooling systems should be provided for each neighborhood. Digital monitoring of these systems and, when necessary, intervention should be possible.

Providing the data produced by smart cities to city businesses, and in this way, businesses launching the right product at the right time, and the prevention of waste will be beneficial.

With the recycling projects that will be started at home, it may be possible to contribute to the economy. For instance, bags can be given out

working systems can be developed to reduce people's mobility.

The road sections in transportation should be changed. Pedways and bikeways should be expanded. Road sections without sidewalks prioritizing humans should be constituted.

Aircom, which conducted a study on the LoRa system, is planning to conduct a development with ISKI. This study will enable remote reading of the meters.

In transportation and governance mechanisms, smart parking lot systems, smart crossroads, and smart vehicles that communicate through a network can be used. Road maintenance work could become automatic with a project that uses ultrasonic sensors to detect and measure the depth of road holes. With this approach, feedback can be obtained from not only citizens but also sensors and devices connected to the internet.

Especially public vehicles should not use fossil fuels. Electric public vehicles should be popularized, and these vehicles should be

> **Aircom, which conducted a study on the LoRa system, is planning to conduct a development with ISKI. This study will enable remote reading of the meters.**

according to the type of waste, and when the bags are collected, points can be earned. These points may then be used to obtain benefits such as in tax, etc.

are necessary.

Artificial intelligence-based smart transportation applications, electric scooters, and electric vehicle use should be encouraged. Infrastructure and routes for autonomous vehicles should be planned. A standard should be established for electric vehicles and filling stations in Türkiye. Parking lot management systems should be built, and vehicle charging stations should be established in parking lots. These parking lots can be designed as multi-storey or underground. Besides public transportation, technologies for individual transportation should be developed as well. For example, bicycle share systems can be constituted. On the other hand, remote

charged with wireless charging systems. Using mobility data of people, building demand-based public transportation systems and popularizing contactless payment Controlling the movements of heavy vehicles, distributing the traffic density equally and reducing the number of vehicles in traffic at the same time will be beneficial.

For governance mechanisms, governance platforms integrated with local governments can be constituted. It is important to establish structures that are supported by users through data input and thus design sustainable structures. To create participating managements, models that will increase the income of local governments can be developed with smart systems.

1.3. Evaluate the situation of readiness with our technology production capacity without the external dependency of the component(s)/subcomponent(s) and tech¬nological systems determined in the first and second questions and determine what can we meet through domestic production (30 min.)

In terms of product production and application, Türkiye is ahead of many countries. In terms of software, especially in BigData and artificial intelligence, we can meet the needs in general. Within this scope, optical reading, fingerprint scanners, smart meters, sensors, smart building systems, solar energy panels, smart lighting systems, data processing centers, and security systems can be afforded by domestic sources.

To establish smart cities, an ecosystem is necessary. And attendance and contribution of competent people in their fields to the ecosystem should be ensured. Support should be received from domestic companies that are experts in the fields of software, hardware, and field experience. Even if the first product sale is cheap, maintenance and software services can be very costly later on. Even if the hardware is foreign, it should be made available for use by domestic software and maintenance.

In some cases, foreign brands earn higher levels of trust than domestic ones. To prevent this, qualified and credible domestic production and products should be supported. A portal can be constituted as a solution. Through this portal, companies and customers can be aware of each other. The products from technoparks are often heavily academic and not applicable to the sector. The collaboration of universities with industry and awareness should be ensured, and the studies and products should have a response in the market.

Special-quality driven projects may be beneficial in this, however, driven projects are often conducted in the service industry. Importance should be attached to developing product-focused driven projects.

In terms of hardware, there are deficiencies in technological products. If there is enough demand and incentive for lacking technologies such as hardware, etc., they can be domestically produced. Different intermediate products and raw materials used in domestic production are imported from other countries. Therefore, creating software solutions is harder. For example, there are problems regarding the batteries of electric vehicles.

The technological components can be produced with domestic sources despite hardware deficiencies;

-The fiber communication spine can be constructed and generalized using 90%

domestic materials (except camera sensors and IoT sensors).

-It is possible to build online interaction platforms and use them in thematic areas of smart cities using 90% domestic materials (except server infrastructure, license and network devices).

-Diagnosis and follow-up mechanisms (thermal measurement systems, video analytics-based systems, numeration and analysis systems) can be developed using 70% domestic materials (except camera sensors and IoT sensors).

-The maximization of accessibility to security areas in disasters and emergency situations can be done with domestic sources.

-Wearable health technologies (necklace, ring, watch, mobile applications, etc.) can be brought into use using 90% domestic resources (except sensors).

-Data inventory systems and wealth management can be done with domestic resources.

-Monitoring smart cities, inspection and early warning systems (air quality, noise level, vehicle counting systems) can be done using 90% domestic materials (except camera sensors and IoT sensors).

-Systems that can subsidize themselves (using renewable energy actively in this region) can be built using 20% domestic materials.

-Water and waste water (gray water) management can be established, and the opportunity for recovery through treatment facilities can be provided using 50% domestic materials.

-Entrepreneurship, R&D and innovation work can be provided using domestic materials.

-Micromobility solutions depending on geographical location (electric scooter, and electric bicycle) can be generalized using 90% domestic materials (motor equipment,

and IoT sensors).

-Parking lot management systems can be established, and vehicle charging stations can be included in parking lots using domestic sources.

-All kinds of communication infrastructure such as low frequency and wireless technology, which can be used in smart cities, can be established using domestic sources. Actually, every element of a smart city can be produced domestically. These can be put in order as follows: GSM technologies, low-frequency communication, high-speed Wi-Fi, new types of tracking devices, city traffic control systems, health monitoring systems, and human and animal tracking systems.

Transactions can be made in order to increase domestic source usage;

-Developing a system of education that can be accessed remotely (such as the open-source software JITSI recommended by TÜBİTAK)

-Developing a disaster early warning system software,

-Designing solar-powered smart city furniture (such as indirect energy post of Verison Technology, "Yaprak" earthquake post of İSBAK) to meet the energy and informing needs post-disaster

-Developing energy storage systems (such as TOGG and Zorlu Energy Systems),

-Public institutions to use both software-based secure networks in use today and those being developed in critical energy infrastructures,

-MİLAT project (a software that ensures information security through domestic algorithms and designs), making high technology communication systems with domestic and national resources with ULAK 4.5 G- LTE Base Station project

-Developing individual vehicles (MARTI, Scooter, etc.)

-Developing remote authentication systems (through T.R. Identity Card),

-Contactless payment systems (BELBİM Company, ASİS Company, KentKART),

-Developing blockchain systems (CERTBY Company),

-Developing 5G systems to be used here using IoT smart devices

-Producing IoT systems,

-Developing domestic security camera systems,

-Developing Bluetooth-based travel time calculation and optimization systems (ISSD)

-Establishment of smart waste management systems,

-Putting photonic technologies into the agenda to actualize many technologies that will be used in health technologies and smart cities with lower costs,

-Producing SCADA technologies domestically

-Working with providers with domestic production certificates, constituting joint working groups, and producing byproducts with a joint production understanding

-Establishing clustering systems in order to enhance industry-university, public-university, and public-industry collaborations

That being said, smart cities is not just about technology investments. First of all, people's needs should be determined. To increase productivity and to manage the process right, first of all, people's needs should be examined and the right communication channels should be used. Domestic companies will rapidly comply with smart city standards after they are determined. Additionally, the level of public readiness for these new developments needs to be evaluated.

PİLOT application initiated by Türk Telekom to reduce external dependence aims to increase technologies in new fields. By collaborating with startups, support will be provided to studies beneficial for Türkiye. Türk Telekom

startups, which also work on smart cities, are regarded as important in terms of solutions. Therefore, startups creating domestic and national solutions should be supported. When it comes to the public, foreign products are at the forefront. The government should provide support for domestic projects' marketing strategies. At the point of smart solutions, investor portfolios should increase.

For the establishment of geographical information systems, more integration with the environment should be provided. With proper satellite imaging, environmental project monitoring systems can be followed.

Besides, focusing on the governance field is also necessary. Integration software in the field of smart cities and governance software managing all the topics are necessary. Every municipality can follow a fruitful path in terms of reaching the breakdown point of the process analysis by determining their priorities within themselves.

There are deficiencies regarding IoT. To overcome these deficiencies, the recognition of domestic companies should be increased. Domestication can be ensured through working systems. The domestication of the systems that measure data and transfer them to sensors will be beneficial.
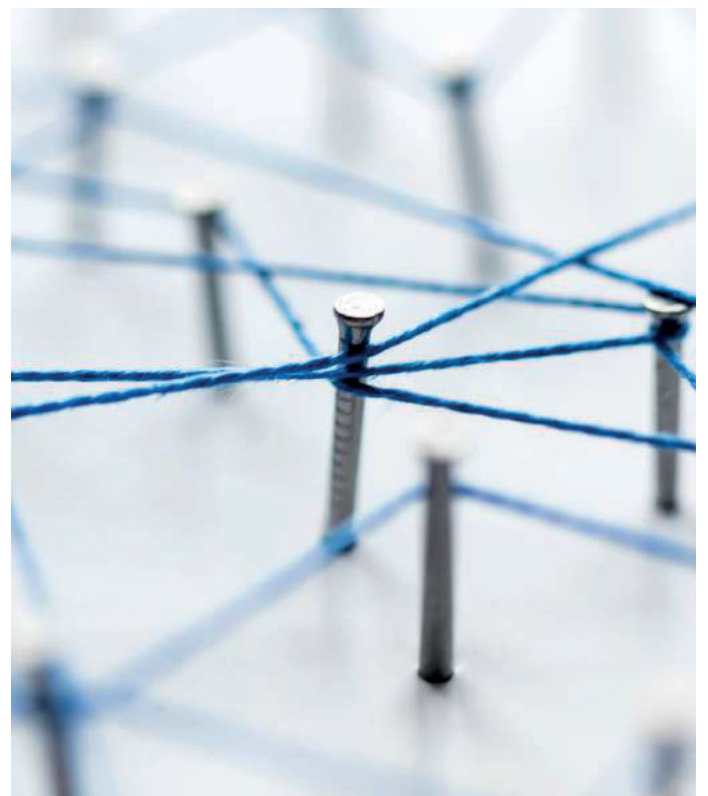
THE WORKSHOP BROADCASTED LIVE DIGITALLY HAS RECEIVED 44.452 INTERACTIONS

2nd SESSION

2.1. Evaluate what should be smart city applications should be provided to transform cities into data-producing centers¬ as well as which infrastructures depending on this must be. (25 min.)

Smart applications that will ensure integration with people, such as smart stops, smart traffic, etc., should be developed. However, it should also be considered that especially the elderly can use these applications.

Smart cities should be designed as clean, happy and healthy cities with easy transportation facilities. In smart cities, not only technological structures but also structures that will be needed in terms of sociology and psychology should be placed. Therefore, social solutions should have a place in smart city applications.

When it comes to the transportation of data, fiber structures come to forefront. To ensure continuity, wireless communication systems should be established. Collecting data from houses through a wide band system will also increase data. Establishing an end-to-end fiber structure in terms of cost and integrating this system is crucial for the continuity of communication. Where fiber networks are not enough, the necessary structure for 5G technology should be established.

Data regarding the environment, energy, and transportation should be collected and measured. At this point, Telekom data can be used. People living in the city should be followed up for security as may be required, and data aimed at this should be produced.

The data collected should be made available for use by entrepreneurs with the Open Source Platform.

Another topic is deciding what the architectural design will be like in Türkiye. It is also important to comply with the reference architectural standards determined by the Ministry of Environment and Industrialization. When determining architectural infrastructure, the determined location should be taken into consideration and the architectural design, which is the continuation of the smart city action plan, should be scaled and its standards should be determined.

Smart applications can be developed;

-Safe parks application

-Smart lighting applications,

-Smart parking lot applications,

-Smart traffic lights,

-Applications taking care of disability access,

-Producing data that will manage the behaviors of pedestrians correctly, and smart card applications for the evaluation of these data

-Smart data systems that will ensure the integration of the Ministry of Health, which will keep data, with the private sector

-Integration of municipalities into the e-devlet system,

-Advanced face recognition systems,

-Checking stray animals and developing applications for their feeding,

-Creating a data layer (data analytics, data classification, data visualization, data normalization),

-Developing an API gateway layer,

-Developing channel applications (artificial intelligence, chatbot, mobile applications, CRM, etc.)

-Business intelligence applications,

-Mobile Applications-Personalized data collection points (Voluntary city messengers to tour the area and provide data on the problems they detect)

Massive amounts of data are produced by local governments in Türkiye. The storing and usage of this data can make the city administration more productive in data mining. Training data engineers should be prioritized.

When the collected data is mapped, the reasons for the complaints in certain regions become more understandable for local governments. To ensure the accuracy of data in the cities, standardization should be constituted and data should be produced within the scope of these data standards.

Structures that will be required;

-A strong data security infrastructure should be constituted. Within this scope, for the protection of data, cybersecurity studies should be prioritized for the protection of personal data.

-A domestic cloud software environment for data storage is also required.

-Communication infrastructures,

-Sensory mechanisms,

-Smart kiosks, smart posts, thermal cameras, smart panels,

-Big data centers to hold data,

-Smart IoT devices that can make transactions,

-Smart devices that can be placed on taxis or buses (Traffic density, security problems, etc. detection can be made thanks to these.),

-Filtering water, energy, and sewer systems through one gallery system, conducting this on one system, monitoring these systems digitally,
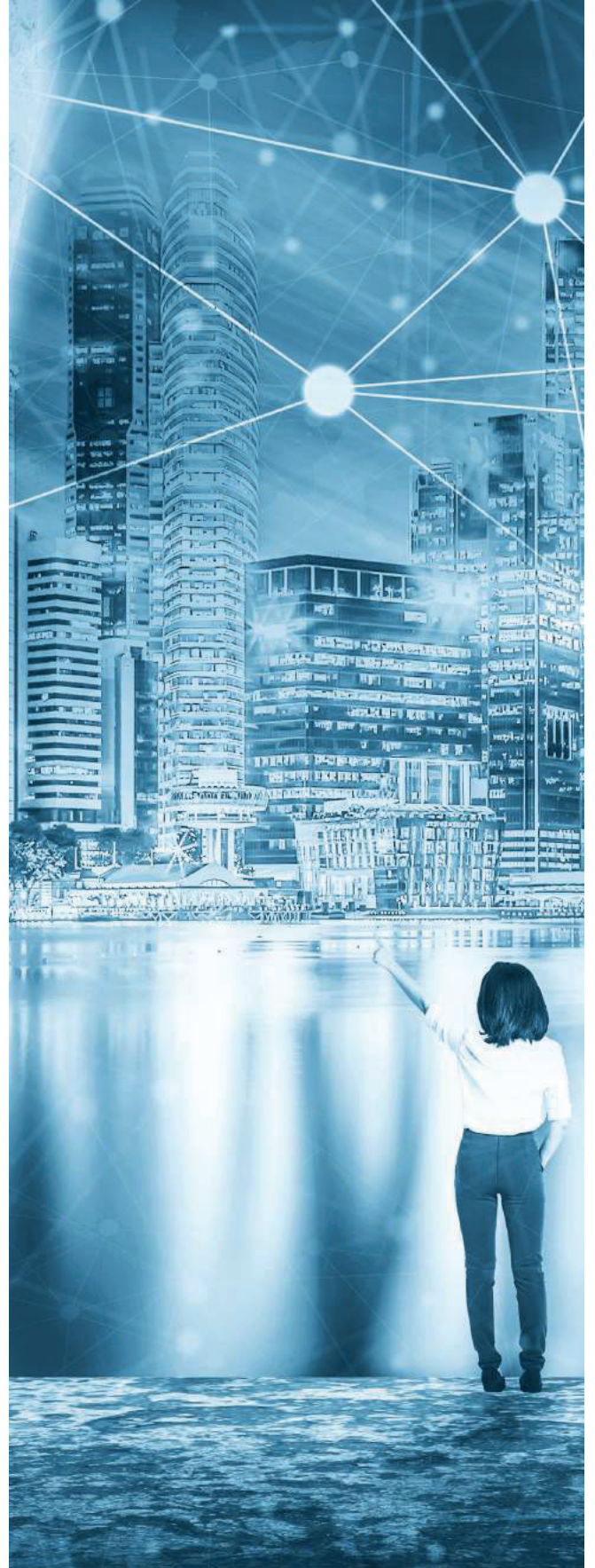
2.2. Evaluate the utility of the data produced and artificial intelligence algorithms in the applications of technology-focused companies within the framework of PDPL and legal legislations (20 min.).

Public fieldwork and the monitoring of management units can be a subject of debate. Therefore, using personal data by obtaining personal consent is important.

By analyzing video analytics, artificial intelligence, deep learning algorithms, and image data obtained using existing cameras, related scenarios can also be used. Local governments will be the most authorized institutions when deciding these scenarios.

Since most of the data obtained by local governments are aggregate data that will be used for the public interest, they should not be placed in the scope of personal data. Most of these data come from the citizens. It is considered that using the data obtained from citizens for themselves, as long as the personal data are not shared, is not against regulations. However, the framework for determining which applications are in the public interest should also be determined.

The data can be used anonymously if they are used for the public interest. Real data will contribute to technology-focused companies developing applications. Personal data should not be used commercially without permission. Therefore, legal legislative arrangements should be made.

By anonymizing city data, the processing of data with artificial intelligence algorithms should be allowed in cloud information technologies.

The data collected from sensors should not be matched with people and collected anonymously. Instead of detecting people who throw too much rubbish on the ground using artificial intelligence and cameras, it should be focused on preventive measures such as increasing the number of rubbish bins.

In case of theft of personal data, to conduct precaution measurements effectively, which institution has a weakness should be detected. In addition, multiciphering methods, preventing access to holistic data, developing mobile applications and tracking digital footprints are also necessary.

Municipalities' open data can be shared with technology development zones and R&D zones within the legal framework.

Applications producing data from smart cities should be evaluated based on applications and restrictions should be imposed.

For users who would like to share their data within the scope of Personal Data Protection Law (PDPL), an interface or a platform can be designed and the data can be guided in accordance with personal desires. Also,

selecting city messengers within the scope of PDPL, and developing an application for city messengers to convey the problems of the city and monitor the solutions will be beneficial.

The government has started to impose new laws on the use and sharing of data. Artificial intelligence having data aimed at private life is a significant subject. To protect private life, the frameworks of laws to protect data should be determined. There are many criteria that the

government should take into consideration. To prevent private data from falling into the hands of someone else, serious laws and borders should be put into practice. Standards should be established in line with data use, share and storage principles regarding the smart city. These studies can be supported by also constituting data use ethical rules.

Legislative regulations should be put into practice regarding which data will be shared, and the use of the right data in the right place.

In constituting legal legislation, the revision of existing PDPL by taking the opinions of not only legal participants but also taking the opinions of the participants from different professions (on a sectoral and academic basis) interested in this topic will be beneficial. On the other hand, since the existence of legal legislation and enforcement is not a deterrent, there are problems in the implementation of the existing PDPL.

Especially during the COVID-19 pandemic, making location data more significant by processing the data with artificial intelligence algorithms was very beneficial. Where and how dense the population is in İstanbul could be displayed using the location information provided by operators.

By making sense of the data where disconnection is present and evaluating the data as a power failure, Türk Telekom can share data with electricity provider companies and, as a result, identify the areas that are affected by failures.

2.3. Evaluate what can be the incentives, measures that should be taken, and ne¬cessary infrastructural and legal arrangements to achieve the goal of transforming the city into a working area for technology-focused companies. (25 Min.)

It is necessary to establish a fund for conducting and popularizing infrastructure studies. It will be beneficial to expand the area of on-site R&D centers, increase the facilities available for receiving incentives, and include remote work systems within the scope of the R&D incentives.

Municipalities can make a certain fraction of their technology investments to the companies developing applications in the field of smart cities within their own hinterland. Incentives for startups and incubation centers should be provided. These incentives can be given for the office, taxes, and personnel costs. Tax incentives should be provided to companies creating smart solutions. Besides, making different legal arrangements and providing incentives for developers transformed into SMEs will

To organize work in municipalities, smart city departments should be established. The public should serve as an inspector in this process; it should support production but should not be involved in it.

A legislative arrangement is required

which allows municipalities and telecommunication institutions to be together and encourages collaboration. Consortiums that will encourage the collaboration of the private sector and the public in this field will increase the productivity of the studies.

Monitoring and evaluation should be conducted for the incentives granted to companies. Incentives should not be granted to only one area but also to projects where different disciplines can speak or contribute

> **In Türkiye, technoparks are usually located outside the city and rentals are high. In the cities, constituting technopark areas interbedded with the community is crucial.**

increase the benefits.

psychologists, data analysts, town planners or architects and encouraging the projects that will be produced on these platforms will be beneficial.

A purchase guarantee should be given to the projects that received incentives on a national scale (TÜBİTAK KOSGEB, etc.) and were completed successfully. For the export of technology produced in the region, privileges such as a green passport can be granted to successful companies and company employees. Prioritizing companies producing technology in recruitments needed by the public will help these companies maintain their activities healthily.

to them. When the example of the Covid-19 pandemic is examined, the evaluation of socio-economic effects that may occur in the platforms where different disciplines can work together such as sociologists, In Türkiye, technoparks are usually located outside the city and rentals are high. In the cities, constituting technopark areas interbedded with the community is crucial.

With the introduction of smart city applications and the advantages they will provide, the investments of global companies in these cities will be encouraged.

Local governments should satisfy the data demands of the companies and startups demanding application areas for the Smart

Cities concept, and permission should be granted for test facilities.

It is necessary to create a common project network for microentrepreneurs and big companies by creating a platform facilitating incentives and precautions. Besides, training human resources to create a technology culture is crucial.

A flexible work environment may ensure the establishment of more creative work culture and decrease the city infrastructure load. However, applications need to be designed to monitor work at home.

A skilled workforce ecosystem should be constituted and accessibility facilities should be increased. Centers that will facilitate social life such as social reinforcement areas, sports centers, public housing, schools, and hospitals should be constituted and migration to these areas should be encouraged.

Common areas that will ensure collaboration and interaction among companies can be constituted. Within this scope, constituting thematic areas and clustering structures (education city, technology city, health city etc.) and granting exemptions to companies located in these areas will ensure the more powerful establishment of the infrastructure favourable for the area. Application areas in which innovative applications can be made should be established. Within this scope, studies can be conducted examining the example of Singapore Tianjin Eco-City.

With the establishment of a shared source ecosystem, a structure will be created that will enable operations other than the company's core operations (law, employment security, HR, design and testing processes, consulting services, health services, etc.) to be received as services from focused and professional businesses.

For technology and business mentorship,

necessary infrastructure should be constructed and the university-industry collaboration should focus on productibility and result.

The stakeholders of the used technologies should be introduced transparently, and the stakeholders producing these technologies should be supported in terms of getting patents. Educational institutions that will train the white and blue-collar personnel that will be needed by these companies in long term should be designed and served.

Tax exemptions in technoparks or R&D centers should be granted to entrepreneurs. Domestic good certificates should not be left for the approval of management, the incentives should be obligatory. To lighten the tax burden of the personnel, necessary work should be done.

The intellectual property rights of application developers in the field of law require legal arrangements. Also, for the employees working flexibly, arrangements on labor law are required. Similarly, legal arrangements

> The data production of technology-focused companies to reach optimum levels can increase technology and service production. After the popularization of open data use in Helsinki, it was observed that technology investments have increased between 8%-10%.

aimed at the local governments to collect and use security camera data 24/7 should also be made.

2.4. Deter¬mine how the improvement of young entrepreneurship in areas with a heavy young population, and the component(s)/subcomponent(s) and techno-logical systems will allow the establishment of integration mechanisms that can be used in technocities. (20 min.)

To establish a mentorship network for entrepreneurs, collaboration should be made with big and medium enterprises. Organizing competitions for entrepreneurs at focus areas, establishing incubation centers for entrepreneurs, regional entrepreneurship activities, and opening thematic areas and thematic appeals will be beneficial for the improvement of entrepreneurship. Platforms for young people to come together, socialize and exchange information should be constituted.

To transfer vision, getting young people to join domestic and abroad fairs. Stimulating activities will expand the worlds of young people.

> The dynamism of young people and the experiences of experienced people should be combined and the high orientation speed of young people should be turned into an opportunity.
> Within this scope, it should be ensured that entrepreneurs benefit from the experiences of experienced people with experience sharing events.

Incentive mechanisms specific to young people such as Technology Development Zones (TDZ) should be established. These incentives can be planned specifically to the needs of the country and the topics in which young people are interested.

The biggest problem encountered by young entrepreneurs is access to pecuniary resources and the sources of funds. Therefore, consisting of angel investor networks in the zone will be beneficial.

Especially, studies such as establishing entrepreneurship streets aimed at young people should be conducted. In this way, opportunities will be given to young people to create solutions aimed at the needs of the cities.

Regular hackathon studies can be conducted. The leader of the hackathon team should be among the young personnel of technology companies in smart cities. The constitution of the awareness of the ideas produced by hackathon participants should be ensured.

Investors can issue invitations that will attract entrepreneurs developing ideas. By establishing the legal infrastructure and a startup program at the governmental level, domestic and abroad entrepreneurs will be able to attract talented people. In public procurements, positive discrimination can be made against the products produced by young entrepreneurs.

To increase productivity, a living environment in which entrepreneurs can live and work comfortably should be provided. This place has a common test, quality control and infrastructures and is a place where information can be accessed easily. These will increase productivity. By opening DENEYAP (try-do) workshops, it can be provided to young people to gain experience.

Practical and comfortable housing zones can be designed for young people. The areas that will be established should have their own visions and goals. And it should be observable how much they succeeded in achieving this goal within a certain time frame.

Local governments should support the provision of scholarships by civil society organizations (CSOs).

To constitute the entrepreneurial spirit, behavior change is needed. By gathering people from different disciplines together, support can be provided to project development. Academicians should include students in their projects and constitute collaboration models. In legal and financial subjects, consultancy should be provided to young people.

Sharing the activities and projects conducted with the young population regularly will be beneficial in increasing their imagination.

Software training at the level of elementary school can be added to the curriculum. For high school, broader education programs intertwined with technology should be constituted. Therefore, the number of qualified expert software developers can be increased. The institutions that will provide these trainings can be established by YÖK (Council of Higher Education) and local governments. Within this scope, the number of software teachers and companies that will label data should be increased. Additionally, the establishment of thematic technology high schools will enable more focused training activities. Vocational high schools providing

actualize a sustainable model.

Long-term internships are important in terms of knowledge. Universities should provide support for long-term internships. Informatic camps aimed at young people can be organized A structure that will not face the bureaucratic obstacles seen in technoparks and entrepreneurship centers should be established. Young people with innovative ideas will come together here, and they will be for the region and branch choices can be made.

in summer. Therefore, the projects can be conducted with social activities.

Foreign language education for young people should be given priority, application areas should be constituted, and international student exchange programs should be encouraged.

In incubation centers, entrepreneurs should receive education and they should receive support in putting their ideas into practice. Monthly contests can be organized in incubation centers and new ideas can be encouraged by increasing competition. To

Dissertations of universities; will be given to the students as theses by academicians with breakdowns that will solve the problems. Therefore, it will be possible to contribute to the actualization of a real project.

education in the region will be able to provide education in branches that comply with the thematic areas determined here and train intermediate staff. Vocational Universities can provide an education suitable The focal point of education should be the establishment of entrepreneurship. Therefore, the opportunity to learn by gaining experience should be provided to students.

By giving young people achievement training that will allow them to be the leaders of their own games, support should be provided to them at the point of a good business plan to

reinforce these activities, monitored and qualified career consultancy services should be provided for young people.

The facilities of the technology centers that will be opened should be available to entrepreneurs. In this way, young people will be allowed to contribute by constituting fundamental education and practicing awareness.

Türkiye's Smart Cities e-Workshop
"Esenler"

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This report includes the results of the e-Workshop titled "Türkiye's Smart Cities: Esenler" held online, hosted by Bilişim Vadisi on May 12, 2020. The assessments included in the report are reflecting the opinions of the participants.