Youth & THE CITY

Genesis

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Module 1

What is a Smart City?

Learning objectives

Understanding and defining smart city concepts Analysing the development and implementation of smart cities.

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Course description
Module 1: What is a smart city?
1.1 Definition of smart cities.
1.2 Overview of key elements: technology, infrastructure, sustainability and people.
1.3 Evolution from Smart City 1.0 to 3.0:

- 1.0: Technology-driven, industry-managed (solutions are determined by technology).
- 2.0: Government-managed, still top-down initiatives.
- 3.0: Citizen-driven, created together with the public.

1.1 Definition of Smart Cities

Akıllı şehir, teknolojinin yardımcı olduğu bir şehirdir.
Improving everyone's daily life. Smart cities connect their buildings, transport systems, water systems, energy systems and public services using technology. This helps the city to:
✅Save resources and energy
✅Improve public services
✅Increase citizen safety
✅Protect the environment
For example, a smart city can use sensors to monitor air quality, manage traffic lights or track how much water people use. In more technical terms, a smart city is an urban area where technology, data and digital tools come together to improve people's lives, increase the efficiency of urban services and protect the environment. This allows the city to function better, save money and overcome new challenges. Smart cities use ICT (Information and Communication Technologies) and the Internet of Things (IoT) to collect and analyse large amounts of data very quickly and act accordingly. The OECD explains that smart cities use "digital solutions to make life better, fairer, more efficient and more sustainable for everyone".

The European Commission defines a smart city as one that "uses digital solutions to make services work better for people and businesses, goes beyond traditional technology, improves resource use, reduces pollution, and promotes a cleaner and healthier urban life." A true smart city features advanced transport systems, better water and sanitation services, energy-efficient buildings, safer public spaces, and more transparent and responsive municipal governance. It also caters to the needs of all groups, including the elderly. **Quick summary**:

- Akıllı şehirler teknoloji ve verileri kullanır İnsanların
- günlük yaşamlarını iyileştirir. Kaynakları tasarruf
- eder ve çevreyi korur.

1.2 General description of key elements: technology, infrastructure, sustainability and people

Technology

Technology is the cornerstone of a smart city. It supports urban systems and data-driven decisions. Technology in a smart city includes:

- powerful computers IoT
- devices robust and
- reliable networks

These elements work together like the city's "brain and nervous system" to collect data, analyse it and assist in decision-making. This technology supports the following:

- real-time data (live data) better
- utilisation of cybersecurity
- resources

For example, technology in a smart city can do the following:

- controlling traffic lights according to vehicle flow
- planning public transport routes managing energy
- usage in buildings monitoring water leaks

The subcomponents of technology:

✅ IoT (Internet of Things) infrastructure: Thousands of sensors and devices continuously collect data. For example, they measure air quality, traffic or energy consumption.

✅ Digital platforms and systems These help city managers understand the data and make the right decisions; clear information is displayed on panels.

✅ Communication networks: Fast internet connections ensure that data flows seamlessly between city systems, employees, and citizens without delay.

✅ New technologies: Artificial intelligence, blockchain, and edge computing are new tools that support smart cities.

- AI can predict blockchain issues in advance and keep data secure
- Edge computing processes data quickly closer to where it is
- collected

Hızlı özet:

- Technology helps the city make smart decisions. Sensors and
- networks play a key role.
- They enable faster and better decisions to be made.

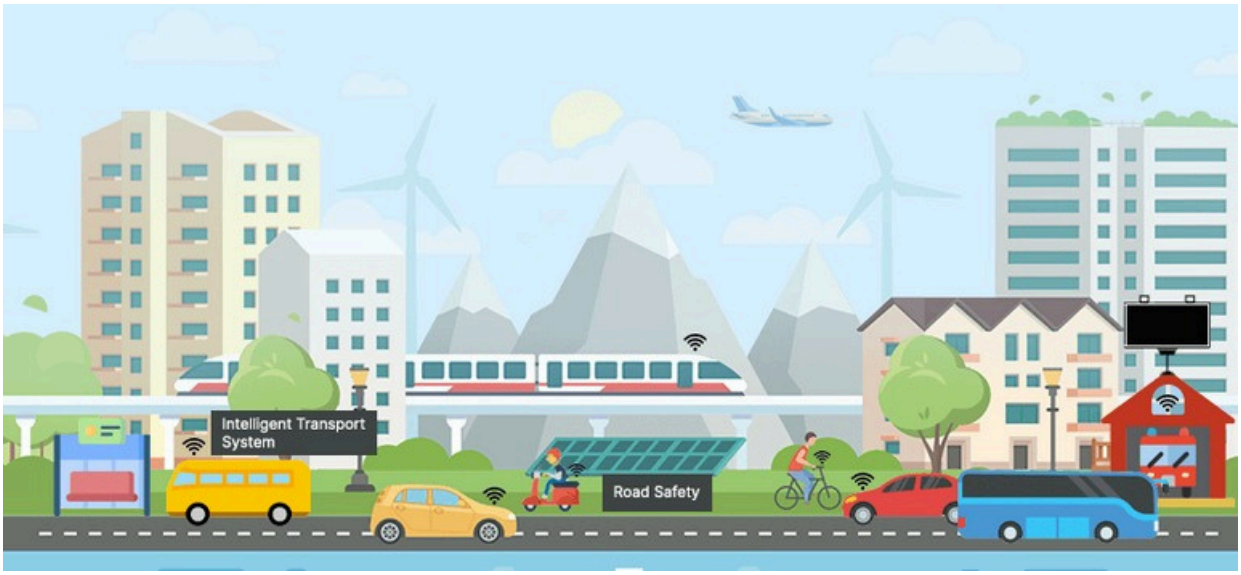
Infrastructure

Infrastructure refers to the physical elements of a city: roads, buildings, water pipes, electricity networks. In a smart city, these elements are connected through technology. This blend of traditional structures and new technologies makes the city stronger, more efficient, and more sustainable. Smart infrastructure can:

- monitor its own performance respond to
- changes
- conserve resources

For example, smart infrastructure can do the following:

- Reducing traffic congestion by changing traffic lights
- Monitoring buses and trains in real time Adjusting
- street lighting according to activity levels



Infrastructure Subcomponents:
✅ Smart buildings use automated systems to save energy, manage heating or lighting, and ensure people's comfort.
✅ Transport networks use IoT and AI to plan routes, manage traffic, and make journeys easier and safer.
✅ Public service systems Smart water and energy systems monitor usage, detect leaks, and ensure supply meets demand.
✅ Integration of urban planning Use digital models and live data to design better urban expansions and climate-resilient neighbourhoods.
Quick summary:

- Infrastructure is the physical structure of a city.
- It is linked to technology to function more effectively.
- It helps the city conserve resources and adapt to challenges.

Sustainability

Sustainability means protecting the environment, supporting social justice, and keeping the economy strong for the future. Smart cities strive to:

- using energy-efficient systems
- using resources carefully
- protecting nature
- creating environmentally friendly transport options

They do this by using environmentally friendly buildings, encouraging recycling and working with local communities on policies that protect the planet.

The sub-components of sustainability:

✅Environmental management Monitoring pollution, managing waste and protecting nature.

✅ Resource optimisation Using technology to reduce waste and save water and energy.

✅Climate resilience Preparing for and responding to climate risks such as floods or heatwaves.

✅ Sustainable mobility Promoting cleaner transport options such as electric buses, shared bicycles or trains.

Quick summary: Smart cities protect the planet. They use resources wisely and focus on green and environmentally friendly systems.

Individuals

People are at the heart of smart cities. Technology should assist them, not replace them. Smart cities involve people in the decision-making process, ensuring that urban services meet their needs. Furthermore, the services should be easy to use and less

Human beings consist of the following components:

✅ Citizen participation Use online tools or local meetings to enable people to share their ideas and vote on projects.

✅ Digital services Enable people to use apps or websites to access services, report issues, or obtain up-to-date information about the city.

✅ Skills development Teach people the skills to understand and use smart city tools.

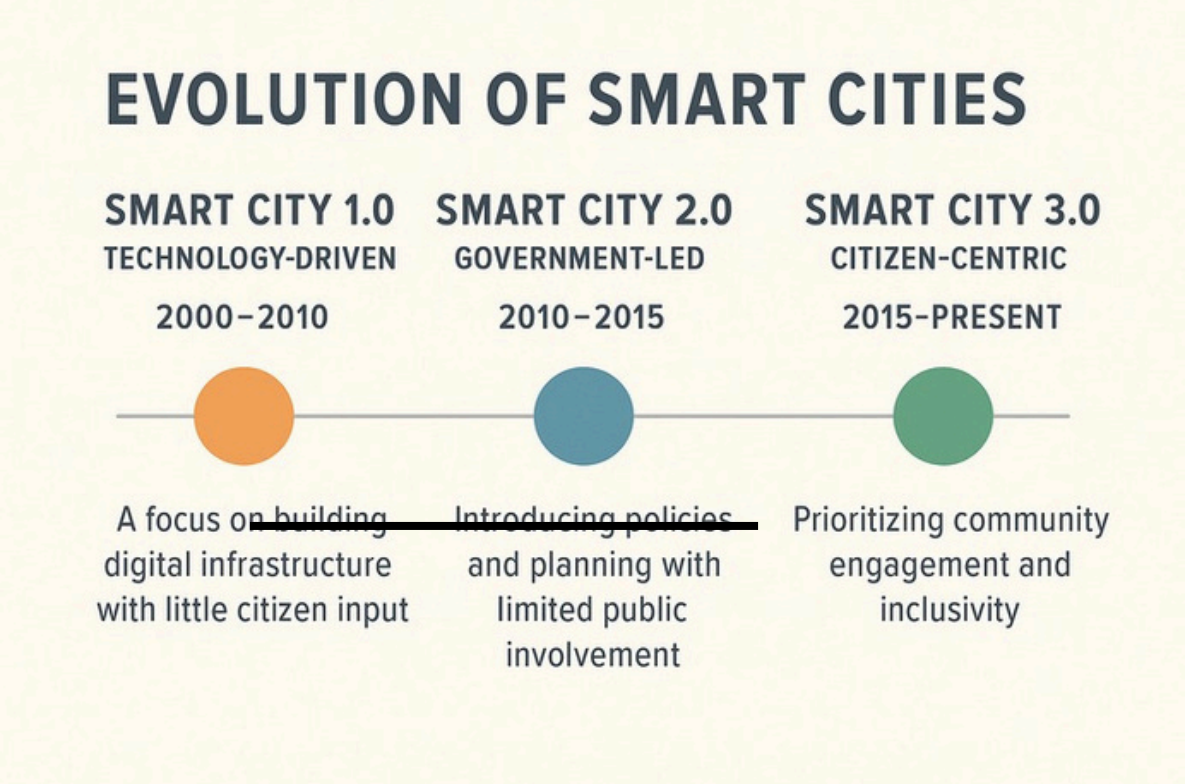
✅ Social inclusion Ensure that no group, especially disadvantaged groups, is excluded from the benefits of smart cities.

Quick summary:

- Smart cities are built for people
- Citizens are part of the decision-making process
- Everyone should benefit from this

1.3 Definition of Smart Cities

The concept of smart cities has developed.
It has changed significantly over time. This change is characterised by three distinct generational shifts, reflecting a growing understanding of the role of urban development and technology in society. Each phase represents a unique approach to integrating digital solutions into the urban landscape, addressing specific challenges and adapting to the changing needs of the urban population.



Smart city 1.0: technology-enabled (2000-2010) At this stage, technology companies spearheaded the changes. They established sensor networks, data centres and automated systems to optimise the functioning of cities.
Example: Songdo, South Korea: a new city equipped with advanced technology systems. However, it struggled to attract people to live there. Why? Because it focused solely on technology, not on the real needs of people.. 👉 **Lesson**: If people's needs are not met, technology alone is not sufficient.

Smart City 2.0 – Government-Led (2010-2015) At this stage, municipal administrations took control. They planned smart city strategies and established public policies to enable technology to serve people better.. **Example**: Barcelona: Saved money and created jobs by installing smart lighting, smart parking and a sensor network. 👉 **Ders**: Governments can ensure that technology serves the public good.

Smart City 3.0 – Citizen-Focused (2015-) At this stage, citizens drive change. People, government and companies collaborate. The focus is on inclusivity, participation and equality**. Example**: Vienna: Citizens' contributions, to plan projects and manage city budgets kullanır. 👉 Lesson: Smart cities should work for people and with people.

Quick summary:

- First came the technological approach (1.0)
- Then came government intervention (2.0)
- Now there is a citizen-centred approach (3.0)

Learning activity

Design your ideal smart city

Objective: Young participants will apply what they have learned by designing their own "smart cities," prioritising sustainable practices, technological integration, and citizens' well-being. This exercise will encourage critical thinking, collaboration, and decision-making while reinforcing the concepts of the module. Outline of the activity Forming groups and assigning roles (10 minutes) Divide participants into small groups, each representing a city planning team. Assign a role to each member of the group:

- Mayor: Oversees the project and ensures that citizens' welfare is prioritised.
- Technology Officer: Focuses on the integration of digital tools and networks.
- Environmental Planner: Prioritises sustainability in infrastructure and policies.
- Community Representative: Ensures citizens' participation in planning and decision-making processes.

Brainstorming about the elements of a smart city (15 minutes)
Each group identifies the core components they want in their smart cities based on the four main elements discussed in the module: Technology, Infrastructure, Sustainability and People. Groups use a checklist of potential smart city features such as IoT for traffic management, smart energy grids, open data initiatives, sustainable transport and community engagement platforms.

Urban planning phase (20 minutes) Using a large sheet of paper or an online collaboration tool (e.g. Miro or Jamboard), each group draws a map of their smart city.

Participants design neighbourhoods, public spaces and essential services, ensuring that each element (technology, infrastructure, sustainability and people) is represented.

- The Technology Manager incorporates digital infrastructure elements such as IoT sensors, open data platforms and artificial intelligence systems.
- The Environmental Planner integrates sustainable practices such as renewable energy, waste management and climate resilience strategies.
- Topluluk Bağlantısı, çevrimiçi portallar ve katılımcı bütçeler gibi etkileşimli vatandaş katılımı yöntemlerini içerir.

Presentation and discussion (10 minutes per group)) Each group presents their smart city, explaining their design choices, how they balanced technology with sustainability, and how they involved the community. After each presentation, the other groups ask questions or make comments about the city's inclusivity, efficiency, and environmental impact.

Reflection and feedback (10 minutes)) Groups reflect on what they have learned, how they made decisions as a team, and the challenges they faced while trying to balance different priorities. The facilitator summarises the key points and reinforces the learning outcomes: integrating smart city elements, prioritising sustainability, and considering citizens' well-being.

Ele alınan öğrenme çıktıları:

- Understanding the components of a smart city: Participants actively apply their knowledge of technology, sustainability, infrastructure, and community participation.
- Decision-making and critical thinking: Teams must evaluate the balance between resources, technology, and citizens' needs.
- Collaboration and communication: Participants should practise teamwork while working on roles and evaluate the interdisciplinary nature of urban planning.
- Citizen-centred planning: Teams focus on designing cities that prioritise the well-being and active participation of their residents.

Key terms

1. Internet of Things (IoT)
A network of interconnected devices that collect and share data in real time. IoT is crucial for smart cities as it supports applications such as smart lighting, air quality monitoring, and traffic management. 2. Data analysis The process of examining data to obtain information and support decision-making. In smart cities, data analysis helps optimise services such as traffic flow, energy consumption and public safety. 3. Citizen participation Citizen involvement in the decision-making process. Smart cities use platforms to facilitate active citizen participation in urban governance and community projects. 4. Smart mobility Transportation solutions that use technology to improve urban mobility, reduce emissions, and increase comfort, such as real-time public transport tracking and electric vehicles. 5. Sustainability Practices that promote long-term ecological health, social inclusion, and economic stability. In smart cities, this includes energy efficiency systems, resource optimisation, and ecological infrastructure. 6. Smart building A building equipped with automated energy management, lighting, and security systems to increase comfort and efficiency while reducing environmental impact. 7. Open data Publicly available data that promotes transparency and enables community participation in innovation and problem-solving processes within the city.

Links to external sources

The Open University's "Smart Cities" Course
This free course introduces the concept of smart cities and covers topics such as urbanisation, systems thinking, citizen participation, infrastructure, technology, data, innovation, leadership, standards and measurement. https://www.open.edu/openlearn/course/info.php?id=12221 "World Bank Group's "Smart Cities for Sustainable Development" report
This course explores innovative approaches to urban development that use data, technology, and stakeholder collaboration to create sustainable, efficient, and citizen-centred cities. https://www.classcentral.com/course/desarrollo- sustainable-world-bank-group-smart-ci-52907 IEEE Smart Cities Resource Centre Access technical resources, videos, documents, and more to enhance your education and professional development in smart city technologies. https://resourcecenter.smartcities.ieee.org/ Global Smart Cities Alliance Resource Library
Discover case studies, models, and solutions on how cities and partners shape smart city governance policies.
https://www.globalsmartcitiesalliance.org/resources "Smart cities introduction" resource list A list of carefully selected books and online courses that delve into various aspects of smart cities and provide more comprehensive information on the subject. https://www.introtosmartcities.com/recursos/

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