Emerging technologies for advancing the implementation of the 2030 Agenda

27 November 2023

Outline

- Enabling Ecosystem

- Big Data

- Internet of Things

- Artificial Intelligence

- Geospatial Technologies

- Immersive Technologies

- Blockchain

Digital & Emerging Technologies
Advancing the Implementation of the 2030 Agenda

Enabling Ecosystem

Enabling Ecosystem

Definition:

- A set of infrastructure and technologies that are critical for deploying and enabling emerging technologies (high speed internet/broadband, data centers, cloud computing and cybersecurity).

- Connectivity/Broadband: Wide Area Networks, Mobile Networks (3G/4G/5G), Wi-Fi networks, Fiber-optics.

- Data Centers: Scalable and reliable, are essential for processing and storing vast amounts of data generated by emerging technologies such as national data centers for Government services.

Enabling Ecosystem

- Cloud computing: Access computing resources over the internet, including software applications, servers, storage, and databases - hosted services (IaaS, PaaS, SaaS) offering several advantages:

  - Scalability: resources can be easily scaled up or down
  - Accessibility: resources are accessible from any location
  - Reliability: offering robust security and backup measures
  - Increased Collaboration, Disaster Recovery, Mobility, Loss Prevention, Cost Savings

- Private cloud, public cloud or hybrid cloud

Enabling Ecosystem

- <u>Cybersecurity</u>: Ensures the security of networks, data systems, and digital assets – it is essential to protect against cyber attacks, data breaches, theft, damage or other malicious activities.

- Many Arab states have realized that the security of cyberspace is an integral part of their economic systems and a matter of national security.

- Arab Cybersecurity Strategy (ACSS) is a 5-year plan which provides guidance and best practices on cybersecurity.

Big Data

Big Data

Definition:

- Set of tools, techniques and technologies used to process, store, analyze, and visualize large and complex data sets, allowing users to gain insights from the data and making data-driven decisions;

- Datasets can come from different sources, including social media platforms, web analytics and sensor networks, and may include structured, semi-structured, and unstructured data;

- Characterized by Volume, Velocity, Variety & Veracity (**4 V's**).

Big Data – Use Cases

- Big Data supports healthcare analytics and management offering improved diagnosis and personalized treatments.

- Big Data aids in water resource management by analyzing vast datasets, thus enhancing efficiency, optimizing usage patterns, and predicting demand

- Big Data analytics for monitoring & managing air quality in cities, by analyzing real-time sensor data, identifying pollution sources, and facilitating prompt interventions

3 GOOD HEALTH AND WELL-BEING

6 CLEAN WATER AND SANITATION

11 SUSTAINABLE CITIES AND COMMUNITIES

Internet of Things

Definition:

- IoT refers to a network of interconnected devices, vehicles, and objects that communicate and exchange data. These devices, equipped with sensors and connectivity, enable real-time monitoring, control, and automation, fostering a seamless and intelligent environment.

- IoT applications span various sectors, enhancing efficiency, convenience, and decision-making processes.

Internet of Things – Use Cases

- IoT-based smart agriculture for precision farming and resource optimization - supports sustainable agriculture practices, ensuring food security.

- IoT contributes to the creation of smart cities by enabling dynamic adjustments of traffic signals to optimize flow and reduce congestion.

- IoT minimizes environmental impact in waste management processes by utilizing smart bins and sensors, to optimize waste collection routes and reduce unnecessary pickups

Artificial Intelligence

Artificial Intelligence

Definition

- Systems that are designed to learn from data, adapt to new inputs, and improve their performance over time, without being explicitly programmed.

- Enables analysis of vast amount of data to identify patterns, trends, and anomalies to inform decision-making.

Artificial Intelligence – Use Cases

- AI-powered healthcare applications contributes to improved healthcare, disease detection and prevention, and well-being.

- AI-driven automation improves workforce efficiency and economic productivity - automating repetitive tasks, reduces errors, and enables employees to focus on more complex activities.

- AI can be used for improving judicial systems, detecting tax evasion, and ensuring transparency.

Geospatial Technologies

Geospatial Technologies

Definition:

- Set of tools and techniques used to collect, store, analyze, and visualize geospatial data (location dimension) providing valuable insights into spatial relationships and patterns, and enabling improved decision-making.

- These technologies encompass GIS (Geographic Information Systems), GPS (Global Positioning System), and remote sensing (RS). Geospatial data aids in mapping, navigation, environmental monitoring, and urban planning.

Geospatial Technologies – Use Cases

- Geospatial data supports urban planning and development by offering detailed information on land use, infrastructure, and population distribution.

- GT aid in monitoring and mitigating the impacts of climate change, mapping for disaster response, and risk reduction.

- GT aid in monitoring and conservation of terrestrial ecosystems by providing real-time spatial data, facilitating informed decision-making.

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Immersive Technologies

Immersive Technologies

Definition:

- Set of digital technologies (VR, AR, MR) that enable users to experience virtual or augmented environments in a way that simulates real-world experiences.

- The Metaverse is a linear progression of VR, AR, MR.

Immersive Technologies – Use Cases

- AR/VR enhances educational experiences by helping learners visualize complex concepts.

- Immersive technologies impact workforce training, handling high-stress situations such natural disasters and remote medical consultations.

- Immersive technologies can help bridge educational gaps and reduce inequalities in access to education. VR-based virtual classrooms for remote and inclusive education.

4 QUALITY EDUCATION

8 DECENT WORK AND ECONOMIC GROWTH

10 REDUCED INEQUALITIES

Blockchain

Blockchain

Definition:

- A decentralized digital ledger technology allowing multiple parties to maintain a continuously growing list of records. (blocks)

- Each block contains a timestamp and a link to the previous block, creating a chain of blocks.

- Once a block is added to the blockchain, it cannot be altered or deleted without altering all subsequent blocks, providing a high level of security and immutability.

Blockchain – Use Cases

- Blockchain promotes innovation in financial and technological sectors by providing secure and transparent transactions.

- Blockchain ensures transparency in product supply chains, promoting responsible consumption abd preventing fraud.

- Blockchain ensures transparency and trust in transactions, such as identity verification during elections to reduce fraud.

Thank You

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