Infrastructure digitalization
PIDA Workshop on Digitalization

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- It is the process of capturing, documenting, integrating, and analysing infrastructure digital data across the total life history of a given facility

- improving the safety, productivity, accessibility and sustainability of infrastructure

- assists service providers to operate and manage their networks effectively and efficiently, as well as to focus on the total lifecycle of infrastructure programmes

- Digital transport systems are those in which information, data processing, communication, and sensor technologies are applied to vehicles (including trains, aircraft and ships), infrastructure, operating and management systems, to provide benefits for transport service users

- ITSs are using digital technologies in all modes of transport to improve safety, reliability and efficiency.

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Transport and Logistics

- In road transport, the important technology systems are the positioning systems, traffic management, and electronic payment and automated vehicle identification. ACIF

- air transport the ICT system support aircraft landing and takeoffs, navigation aid system, radars and Machine-Readable Travel Documents (MRTDs

- In maritime transport, the systems used are the automatic identifications system (AIS), positioning, information management system, and communication systems

- Railway traffic management systems to produce a safe and high-quality services

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Energy

- Digital technologies are set to make energy systems around the world more connected, intelligent, efficient, reliable and sustainable
- The greatest transformational potential for digitalization is its ability to break down boundaries between energy sectors, increasing flexibility and enabling integration across entire systems
- Global investment in digital electricity infrastructure and software reached USD 47 billion in 2016.
- Power utilities are using emerging technologies to facilitate grid management and operation.

Energy

- Oil and gas companies have long used digital technologies to improve decision making for exploration and production assets, including reservoirs and pipelines.

- semi- or fully-automated systems, robotic mining, remote mining, operation automations, mine modelling and simulations, and the use of GPS and GIS tools.

- digital technologies are helping to improve energy efficiency and reduce maintenance costs

- Digitalization can reduce fuel use e.g. aircraft and ships are equipped with more sensors, helping crews take actions to optimise routes

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- ICT ease the design, operation, and optimisation the water and wastewater systems.
- Use smart metering to optimise supply, shape demand and forecast
- Smart irrigation, ICT based payment systems
- improves efficiency gains of water service providers
- Reduces the duration and costs of monitoring and inventory activities. Flow mapping of over 10000 water points in short time in Liberia
- In Senegal SDE supervision for urban water increased network efficiency from 69% to 80% with ten year.
- ICT based platform (mWater) faciliated access to financing for service providers

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ICT

Data volume

- There's a great opportunity to collect more data when the world becomes more connected
- Data are growing at an exponential rate
- Exchanging, managing and securing data between a larger number of organisations is a growing challenge
- Data centres

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Cyber security

- Digitalization is raising new security and privacy risks

- Cyber security is a major area of concern when it comes to big data.

- The protection of intellectual property theft an ongoing issue,

- Cause of disruption by influencing the algorithms that engineers use to determine outcomes.

- CIIP

Cyber security

Incident	Description (from open-source information)
Shamoon 1 and 2 (Saudi Arabia, 2012 and 2016)	"Shamoon 1" virus carried out cyber-sabotage and destroyed over 30 000 computers at Saudi Aramco.
Western Ukraine power grid (2015)	The first confirmed cyber-attack specifically against an electricity network.

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