

Digitalisation Glossary

Term	Definition
Digital Retrofitting	
Digital retrofitting	the process of upgrading a legacy, analog or un-digitalised machine to a connected, digitalised device, making the data digitally accessible
IoT	Internet of Things: devices with sensors, processing ability, software and other technologies that connect and exchange data with other devices and systems over communications networks (e.g. Internet, Wi-Fi, Bluetooth, etc.)
Digital twin	a virtual representation of real-world entities and processes, synchronized at a specific frequency and fidelity. Digital Twins use real-time and historical data to represent the past and present and simulate predicted futures.
Industrial revolution	a period of global transition of human economy towards more widespread, efficient and stable manufacturing processes
Energy harvesting	using energy from the environment which is converted to electrical energy to power electronic devices in a self-sufficient manner
Wireless communication	transmission of data between two or more participants using no electrical conductor, optical fiber or other continuous guided medium. Often used communication technologies using radio frequency are for example RFID, NFC, Bluetooth, BLE, OpenThread, WiFi, 4G, 5G, LTE-M, NB-IoT, LoRa, and SigFox.
Digital platform for Process Industries	
Big-Data	refers to the vast and complex datasets generated from various sources, used to enhance operational efficiency, product quality, and decision-making.
Grafana	an open-source analytics and monitoring system for interactive data visualization.
InfluxDB	a high-performance NoSQL Database, optimized for time-series data, e.g. IoT data.
Apache Kafka	an open-source distributed event streaming platform used by thousands of companies for high-performance data pipelines, streaming analytics, data integration, and mission-critical applications.
Apache Spark	an open-source and distributed processing system used for batch and stream processing of big-data.

On-Premise (Deployment)	runs the necessary services on a company's own hardware infrastructure, i.e. hosted locally
Cloud (Deployment)	runs the necessary services on the cloud provider's servers, like Azure, AWS, etc.
Containerization	the encapsulation of applications, e.g. technologies of a Big-Data infrastructure, into isolated instances.
Orchestration	the efficient deployment, management, and scaling of (containerized) applications.
Digital Twin	
Predictive Modeling	may include variable prediction, fault detection, pattern / cluster analysis etc., where the learning paradigm may be unsupervised, supervised, and semi-supervised.
Data Preprocessing	Tasks in preprocessing may include missing data imputation, cleaning, aggregations/amplifications, etc.
Feature Selection	The task of feature selection is to find feature subsets based on ranking techniques to improve explainability efficiency, visualizations, and model generalization.
Supervised Learning	The task of supervised learning is to use labeled datasets to train (online / offline) learning algorithms for predicting outcomes and recognizing patterns / statistical characteristics of the data domain.
Omniverse	NVIDIA's term for 3D tools built to work with the USD file format now widely adopted by the tech industry
USD	Universal Scene Descriptor – a 3D format created by Pixar and now used by Apple, Adobe, Autodesk and more
Ray traced graphics	A way to represent dynamic lighting in a 3D scene; reflections, shadows, textures are all calculated in real time giving a much more realistic looking scene
Digital validation	
Digital Twin	A digital twin is a digital representation of a physical object, system, or process behavior in its operating environment.
Model Validation	Model validation is concerned with building the right model
AI Model	A model is a program trained on a set of data to recognize certain patterns or make decisions without further human intervention.
Feedstock adaptation agent & Green ICT	
Circular Economy	It is an economic system that uses a systemic approach to maintain a circular flow of resources, by recovering, retaining, or adding to their value, while contributing to sustainable development. This is achieved

	by keeping the inflow of virgin resources as low as possible to minimize emissions and waste produced by the economic system [1].
Industrial Symbiosis	It is the use by one company or sector of underutilized resources from another including waste, by-products, residues, energy, water, logistics, capacity, expertise, equipment, and materials. This approach aims to preserve resources for a longer time and identifies business opportunities to improve resource utilization and productivity [2].
Feedstock valorization	It provides a synergistic alternative for converting biomass and by-products into other products (i.e. heat, biofuel, and added-value chemicals) while decreasing waste released to the environment [3].
Biomass pyramid	The principle of biomass pyramid assumes that first of all, biomass is used for the economically most interesting applications, that are health, food and chemistry, after which the residuals are used, to the greatest extent possible, for other applications, such as energy and biofuels [4], [5].
Information and Communication Technology (ICT)	ICTs are general-purpose technologies (GPTs) that could be applied to various domains to sense the surrounding environment, interconnect items and extract information, creating new interconnected environments while affecting socio-economic and environmental issues of these sectors [6].
Green ICT	Green ICTs are the activities structure that diminishes the ICT environmental impact by using advanced engineering and environmentally friendly solutions, investigating also reverse activities that could have a positive impact on the environment [7], [8].

References:

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