

Datafication Is Vital Role of Iot and Cloud

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Abstract—In this paper we will discuss about the vital role of datafication. It is used in the IoT and CLOUD. because it has different process basically. In IoT act as the sensor – driven data generator. while cloud computing provides the infrastructure to analysis the data, driving insights and digital information across the industries. in IoT as the data collector (datafication sources). IoT device and sensor bridge the physical and digital world. Converting analog and signals (temperature, motion, sound, location) in to digital points. In IoT sensor are embedded in attached to the virtually any objects, from house hold appliances to industries machinery and smart cities infrastructure creating the massive, continuous stream of data IoT enable real-time tracking product tracing and monitoring of storage condition (ie In logistics) converting providing invisible physical process in to actionable data. CLOUD as a data process and analysis (datafication engine). IoT generator overwhelming volume of data, which cloud platforms (ie AWS IoT, AZURE IoT) store efficiency and cost-effectively. datafication is driving the “INTERNET-OF-THINGS 2.0”, where increased volume and velocity of data allow for entered and automated decision-making. The cloud process, filter and analysis this data to identify the patterns, trends, and anomalies. the cloud-based AI tool enable predictive maintenance (predicting machine failure) and real-time operational optimization (ie adjusting traffic lights).

Index Terms—IoT, PaaS, SaaS, AWS, AZURE.

I. INTRODUCTION:

Datafication is the transformation of the real-world activities and physical objects in to structured digital data that can be analyzed for insights. In the combined eco-system of the internet of things (IoT)and cloud computing. It acts as the bridge that turn raw environment signals in to actionable business intelligent IoT as the data generator, IoT devices equipped with sensor and actuator serve as the primary

tool for “capturing “the physical world. they record everything from soil moister in agriculture to machine vibration manufacturing “datafying’ previously unmeasured process. while IoT devices collect the data they offer lack processing power to analysis it at scale , cloud computing provide the scalable infrastructure and massive storage necessary to manage their enormous dataset , allowing organize to perform complex real-time analysis and predicting modellings .this process allow for dematerialization separating information from its physical sources once data abstracted in to the cloud ,it can be manipulated , shared and used to create “DIGITAL TWINS” or simulation that help business predict failure and optimized performance without looking the physical assets.

By datafication process in the cloud, businesses can move from the reactive to proactive operator such as performing maintenance as an engine before it fails based on sensor trends. datafication helps to identify resources waste and automation manual task, significantly reducing cost in sector like manufacturing and logistics. the cloud platforms like as AWS IoT or AZURE IoT HUB allows companies to scale data collection from a few sensor to millions of devices without needing to build their own physical data center , the availability of historical and real-time data allows for the development of new business model such as “product-as-a services” where companies sell the outcomes of machine rather than the machine itself .because the essential of datafication in IoT are :”EYES and EARS” but cloud is the “BRAIN” of the service or the datafication,

II. THE DATAFICATION MEANS:

Datafication is the technology process of transferring various aspect of life behavior and social interaction in to qualified, actionable data points .it turns action like

walking, browsing or shopping into digital, analyzable information used to predictive trends, improve service and enhance decision-making.

TRANSFERRING physical into digital into values converting unstructured human experience such as movement, communication and location into structured data.

EXAMPLE fitness track recording steps (health matrices, smart cities sensor tracking traffic flow, and specific media likes tracking performance).

PURPOSE the data is used to generate insight optimize and create new economic values often referred to as a “digital translation of the real world”

III. DATAFICATION VS DIGITALIZATION

While digitalization converts analog information into digital format. but datafication goes further by rendering processing invisible actions and phenomena into data to analysis.

DATAFICATION in IoT:

It transforming of the physical action, environmental condition and devices behavior into structure, digital data for analysis enabling real-time analysis insights and automation. By converting analog input from sensor into actionable information .it drives operational efficiency, predict maintenance and personalized service across industries like manufacturing, health and smart cities.

The valuable health tracker that converts steps and heart rate into health motion and smart cities technology that track traffic pattern for both city planning. the data generated by connected devices help personalized service and improve user experience .in datafication is drive the “internet of things2.0”. where increase volume and velocity of data allow for enhanced and automated decision-making.

DATAFICATION in CLOUD:

In this processing of converting behavior, physical process and business operation into digital data stored and analyzed in cloud infrastructure, the cloud provides scalable service storages and high-performance computing power to turn massive data stream of IoT, APP and web activities into actionable

insights for compared decision-making and innovation.

The data is collected from various sources such as social media, mobile device IoT tracker and web traffic. the technology like AI, machine learning and big data analytics are applied to store in the cloud for predictive modelling such as for the “STARBUCKS APP” or user personalization often exemplified in NETFLIX recommendation engine. The data-driven decision enable organization to make informed data-backed decision,

While digitalization converts existing analog documents into digital file (like scanning a paper). the datafication capture entirely new data stream – such as your heart rate from a smart watches or social interaction and a platform and transform then into strategic assets, the cloud act as the “back-bone “for datafication because of its ability to handle the massive volume, velocity, of data generated. business can use SaaS(software-as-a-service) or PaaS(platform-as-a-services) model paying only storage and processing their use instead of buying experience on-premises services.

Cloud platforms like AWS, Google cloud and Microsoft azure provide built-in AI machine learning and big data tools extract meaningful insights from raw data,

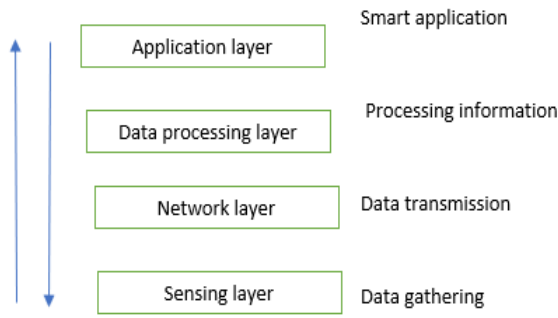
THE DATAFICATION PROCESS:

It is following a multi-step cycle often powered by cloud-native tools. COLLECTION clearing for formatting the “message” raw data to make it machine needed. CLOUD storage moving the process data to data lakes or cloud warehouse (eg snow flaks, big query).

IV. ANALYSIS:

Running algorithm (often AI/ML) to identify trend, such as predicting when a machine might fail or what customs will buy next presenting insight via dash board to inform real-time business decision.

DATAFICATION ARCHITECTURE of IoT:



SENSING layer: this is bottom most layer responsible for detecting physical condition for the environment

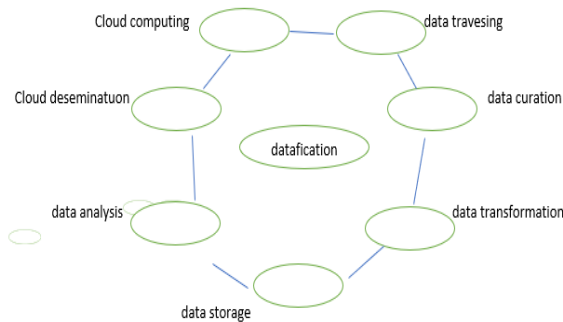
REACTING collect raw data such as temperature, humidity, motion, sound and pressure. Sense collages in the through embedded computes, micro controller and RFID tags.

NETWORK layer this is layer provide confecting and consider between IoT devices and cloud system. it supports device-to-device and device-to-sensor communication.

WiFi, Bluetooth, zigbee, LoRaWAN. It works IoT cloud platforms.

APPLICATION layer: this to top-most layer interacts directly with end user and business system. Provide interfaces to monitor and control IoT device remotely. mobile application web dash board and portals.

DATAFICATION ARCHITECTURE of CLOUD

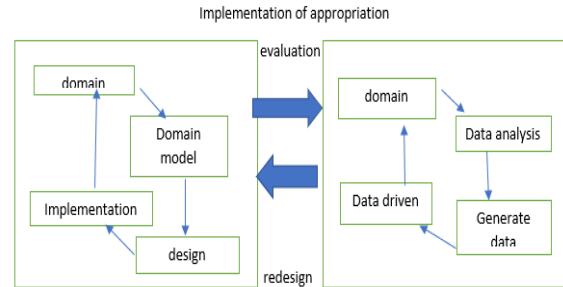


DATAFICATION:

Datafication is the process of connecting an organizational trend in which reliable on data is datafying is another word of datafication. social media platform like Facebook and Instagram provide

surveillance sense datafication refers to the process of collecting and transforming a wide range of action, communication and event in to qualification data

Datafication can occur in many areas including social media usage, e-commerce behavior, GPS location tracking much more while it brings opportunity for insights not efficiency, it also brings challenges and question related to privacy and fairness.



DATAFICATION in IoT and CLOUD:

The context of IoT and cloud is the transformation process of covert in physical object, human behavior and optimized acting in to quantifiable, actionable digital data it shifts the focus from simply capturing information (digitalization)to analysis that data to drive insight enhanced decision making and autonomous process. IoT devices act as sensor capturing raw data. while the cloud provided the scalable transformation for storage and analysis. IoT (data collection) via through the sensor, wearable and machine converting the physical phenomena (temperature, movement, heart rate) in to digital data. Cloud computing (storage and analysis) offers massive scalable storage (data lakes) and computing power to process the high velocity stream generated by IoT devices. Edge computing (real-time process) provide data closer to the source (on the IoT devices or local gateway) to reduce latency essential for instant decision – making in industrial and autonomous system.

V. CONCLUSION:

The datafication is the process of converting everyday life, behavior and physical object in to quantifiable digital data is fundamentally resharing the technology landscape through the integration of the internet of things (IoT)and cloud computing the synergy between these technology enables continuous data collection

scalable storage and advanced analytic driving automation efficiency and new economic values.

The converting of cloud computing and IoT has created powerful -data- driven ecosystem. as IoT devices generated vast volume real-time data cloud platforms, provide the necessary infrastructure for storage and high- speed processing. this collaboration allow organization to move for manual operation to intelligent, automated decision0making, increasing competitiveness and operational efficiency, while beneficial the reliance on datafication create substantial risk regarding privacy and branches and algorithmic bias. The future will focus on strategy cyber security and developing robust data governance frame work datafication is an ongoing strategic shift that act as catalyst or innovation across identification such as health care, smart cities and manufacturing raw information in to a VITAL strategic ASSETS.

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