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→ Study of Existing iot plateform and Middleware

(A) IOT Plateform :→ All the IOT devices are connected to other IOT devices and app. to transmit and receive info. using protocols. There is a gap b/w the IOT device and IOT app. An IOT plateform fills the gap b/w the devices (Sensors) and application (network).

An IOT Plateform is an integrated service that fulfills the gap b/w the IOT device and app. and offers you to bring physical object online.

| Application | Data Storage/ analytics | Consumer app. | Industrial app. | Business app. | your app. |

IOT PLATEFORM

| Hardware | Mobility | Tags/beacons | sensor | Health and fitness devices | Consumer/ electronic |

Automotive   Embedded hardware
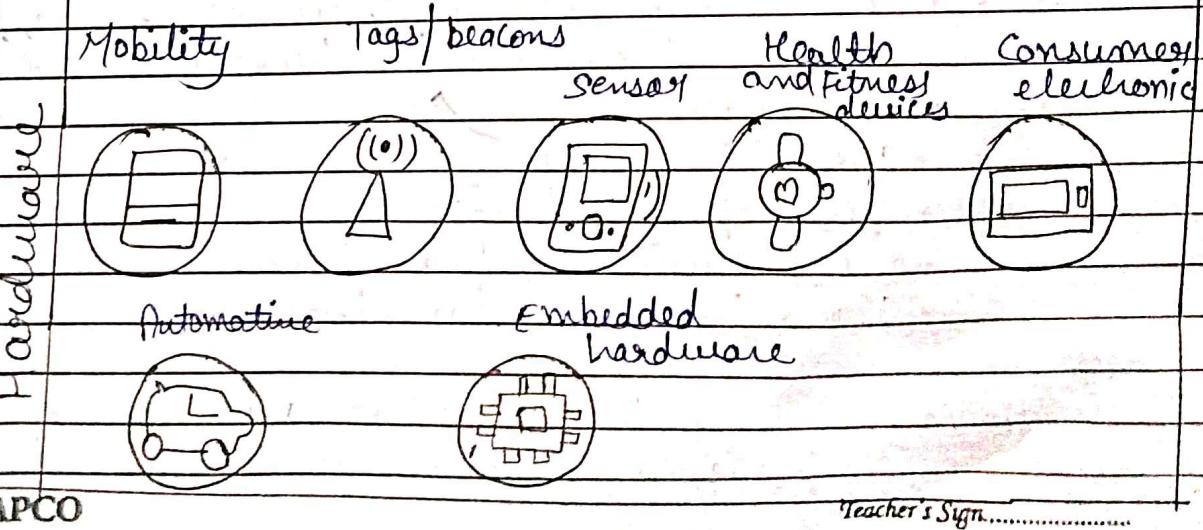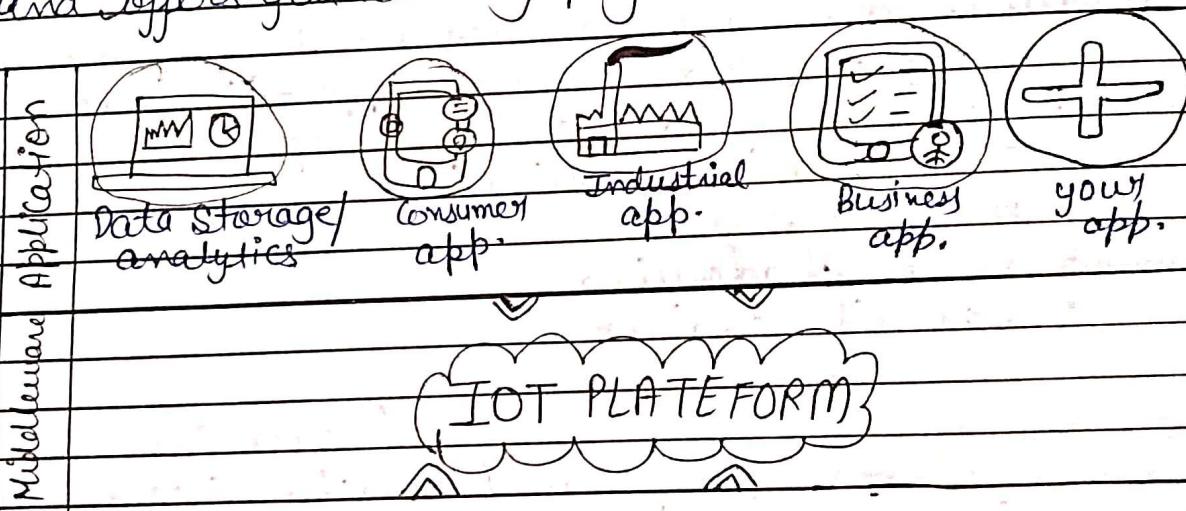
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There are several IOT plateform available that provides facility to deploy IOT app. activity. Some of them are listed below :→

① Amazon web services IOT Plateform → AWS IOT Plateform offers a set of services that connect to several devices and maintain the security. as well. This plateform collects data and from connected devices and performs real-time actions

② Microsoft Azure IOT Plateform → Microsoft azure IOT Plateform offers strong security mechanism, Scalability and easy integration with system. It uses standard protocals that support bidirectional Comm. b/w connected devices and plateform.
- Information monitoring
- A rule engine
- Device shadowing
- Identity registry

③ Google cloud plateform IOT → Google cloud plateform is a global cloud plateform that provides a solution for IOT devices and app. Some of the features provided by google cloud IOT Plateform are :→
- cloud IOT core
- speed up IOT devices
- cloud Publisher-Subscriber
- cloud Machine learning engine

④ IBM Watson IOT Plateform → The IBM watson IOT plateform enables the developer to

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deploy the app. and building IOT Solution quickly.
This platform provides the following services.

- Real-time data Exchange
- Device management
- Secure Comm.
- Data sensor.

How IOT Platform help:→

- IOT Platform connects sensors and devices
- IOT Platform handles different software Comm. protocal and hardware.
- IOT Platform provides security and authentication for sensor and users.
- It collects, visualizes, and analyzes the data gathered by the sensors and device.

(B) Middleware in IOT → IOT middleware is software that sits between the hardware and app. layers in an internet of Things system, providing a set of services and functionalities to manage the comm. and interaction b/w different IOT devices, platforms, and apps. IOT middleware is essentially the glue that Connects different Components of an IOT system, enabling them to work together seamlessly.

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HOW IOT Middleware works?

IOT middleware works by providing a layer of software b/w hardware and app. layers in an IOT system. The middleware layer provides a range of services and functionalities that enables the comm, coordination, and management of diff. IOT devices, platforms, and applications.

→ Components of IOT middleware :→

① Communication middleware :→ This middleware layer is responsible for managing the Comm. b/w different IOT devices and platform. It provides a set of protocols and standard for data exchange.

② Device management middleware :→ This middleware layer is responsible for managing the Configuration, monitoring, and Control of IOT devices. It provides a set of tools for device registration, provisioning and firmware updates.

③ Data management middleware :→ This middleware layer is responsible for managing the Configuration monitoring, and Control of IOT devices data generated by IOT devices. It provides a set of tools for collecting, storing and processing data.

④ Security middleware :→ This middleware layer is responsible for providing security and

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primary services to IOT app. It provides a set of tools for authentication, authorization, and encryption and enables secure comm. b/w IOT device and app.

→ Types of Middleware and Their Functionalities:→

There are several types of middleware, each with its own set of functionalities and use cases.

① Application enablement platforms (AEPs)→ AEPs provide a set of tools and services for building, deploying and managing IOT app. They typically include a range of data management, device management and security feature, as well as tools for creating custom dashboards and analytics.

② Integration Middleware → Integration Middleware Provides a set of Tools for integrating different IOT devices and platforms.

③ Gateway Middleware → Gateway middleware provides a layer of software b/w IOT devices and the cloud, enabling local processing and analysis of IOT data.

④ Message - oriented middleware (MOM)→ MOM provide a set of tools for managing message based comm. b/w different IOT device and platforms.

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→ Advantages of Middleware :-

① Integration and Interoperability

② Scalability

③ Security

④ Reduced development time and cost

IOT DEVICE		IOT Gateway		Data Processing	Security	Application users
		Application →		Data Transformation	Authentication	
Sensor						Big Data /BI
		U.I		Analytics	Authorization	
Actuator		DB		Context Processing	Accounting	Enterprise App. / App.
				Storage	Log	Rules & control

Device Management

Service Agent

Procedure		IOT Middleware		Enterprise Layer

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