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SUB: IOT

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UNIT TEST I

(1)

10. IoT, defined as "the coordination of multiple machines devices and appliances connected to the internet through multiple networks" which can be quiet useful in healthcare section.

→ Raspberry pie is small-single board computer with great computational power which can perform multiple tasks together which makes it so useful for RPM (remote patient monitoring)

→ For example CMED health provides IoT enabled heath monitoring solution via mobile app.
User can monitor their primary health vitals remotely by integrating smart medical devices with app
The measured data is sent to CMED's cloud server, which can be accessed & analysed by doctors

→ IoT can also help to protect hospital staffs from spread of virus.

Other hardwares which can be used for this is

↳ CAMERA - to detect if social distancing is maintained

↳ THERMAL SENSOR - to detect if anyone is having high fever which is major symptom of covid-19

↳ MOTION OR IR SENSOR - for automatic sanitization process so staff won't have to touch any unnecessary items.

↳ RFID based entry - for crowd control

↳ OXIMETER - to keep track of oxigen level for safety.

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Q11. The major components of IoT are as follows

→ SENSORS / ACTUATORS - there are various devices & sensors which are used in IoT
- these devices collect data from the environment & transmit information to the next layer
- various sensors are temperature sensor, humidity sensor, light sensor etc.
- All these devices and sensors are connected to low power wireless networks like wifi, zigbee, bleetooth etc.

→ GATEWAY - Gateway acts as a middle layer b/w devices & cloud to protect the system from malicious attacks & unauthorize access.
- they are configured to perform pre-processing of the collected data from thousands of sensors locally before transmitting it to next stage

→ CLOUD - cloud is platform used to store massive data from devices, application and users created by IoT
- IoT cloud offers ~~created by IoT~~ tools to collect process, manage & store huge amount of data in real time.
- The data can also be accessed remotely due to cloud & so critical decisions can be made easily.

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→ ANALYTICS - this component is useful to extract important information from all the data stored in cloud.
- big companies use this feature for their massive data utilize the insight for their future business opportunities
Eg Facebook, Instagram etc.

→ APPLICATIONS (UI) - this are the visible, physical part of the IOT system which can be accessible by users

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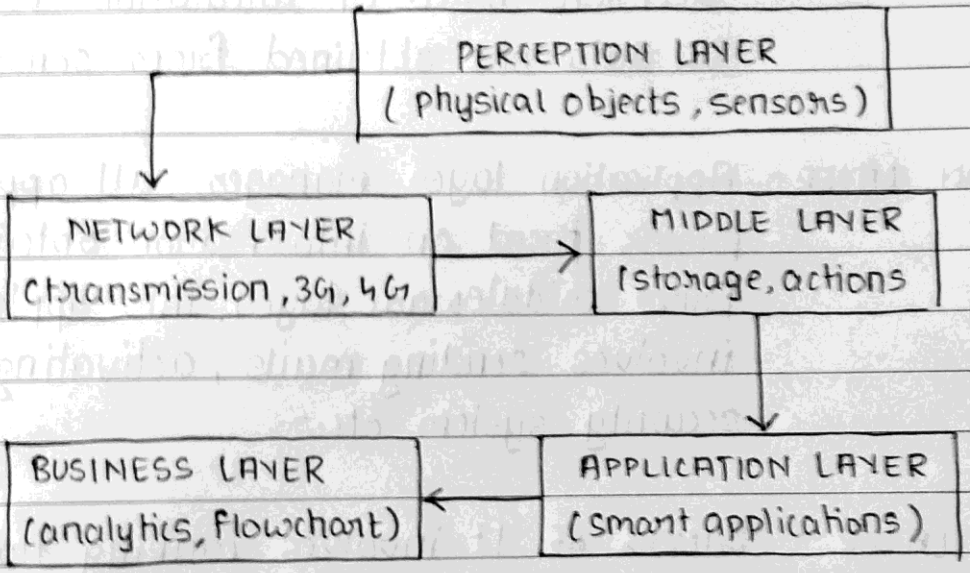
12. VARIOUS LAYERS OF IOT APPLICATION

Internet of things includes large number of smart devices connected to broad network with the help of various technologies.

5 layers are as follows :



(i) PERCEPTION LAYER - This is the first layer of IOT architecture In this sensors & actuators are used to gather useful infortion like temprature, moisture, etc.- Main function of this layer is to get information from surroundings and to pass data to another layer so that some actions can done based on that informations

(ii) NETWORK LAYER - It is connecting layer between perception and middleware layer. It gets data from perception layer & passes data to middleware layer using networking technologies like 3G, 4G, etc.-

This is also called communation layer because it is responsi for communication b/w perception & middleware.

(iii) MIDDLEWARE LAYER- It has some advanced features like storage, computation, processing, action taking capabilities. It can also take decisions based on calculations done on data-set obtained from sensors.

(iv) APPLICATION LAYER - Application layer manageres all application process based on information obtained from middleware layer. This application involves sending mails, activating alarm, security system etc.-

(v) BUSINESS LAYER - ~~Success of~~ It involves making flowchart, graphs, analysis & results & how device can be improved etc.-

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13. (A) As per my views IOT can change / solve problems for education industries

→ Improved school management efficiency

↳ Managing an education institution requires filling in a IOT of paperwork, keeping track of supply management, distributing salaries properly.

↳ IOT solutions lay faster, risk-free, inter-connected decision making frame work where all are engaged in improving the state of facility

→ Real time data collection

↳ Processing of terabytes of data simultaneusly
↳ safty tracking
↳ student progress monitoring

→ Improved resource management
↳ helps in establishing run more efficiently reducing operating & storage costs in long run

→ Additional, facility manager using IOT

→ Examples of IOT in education

↳ Edmodo, to connect students and teacher

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(B) In automatic students attendance system bot IoT & ML plays a crucial role

→ Different sensors, camera, (motion sensors) etc. - which are components of IoT can be used to collect input (in form of image)

→ ML part (face detection, comparision & recognition) is used to increase its efficiency & accuracy

→ The ML model identifies the face & returns true or false as answer. If true then attendance is marked, otherwise student is absent