DEPARTMENT OF COMPUTER AND COMMUNICATION ENGINEERING
INTERNET OF THINGS: FOUNDATIONS AND APPLICATIONS LAB
MMH: ITFL316064E

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1. Draw and explain a block diagram of IoT System.

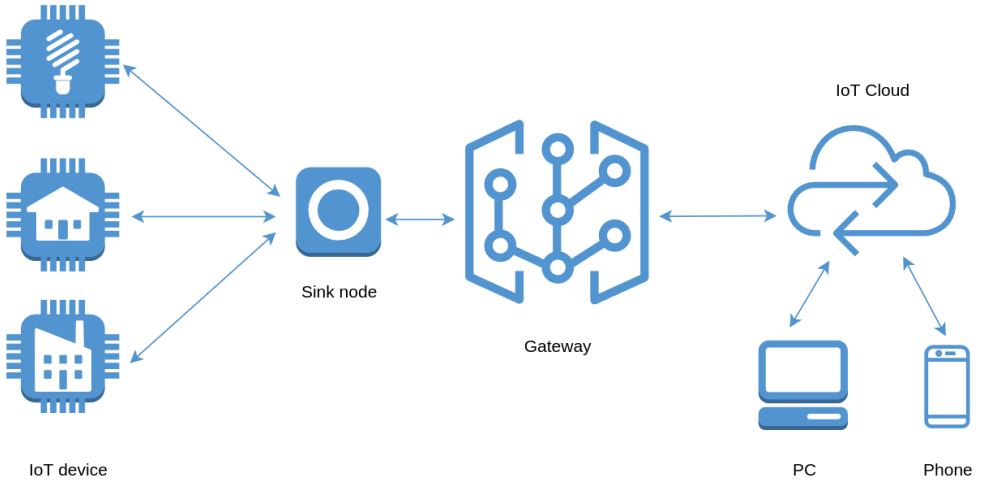


Figure 1: Iot System

My group divide Iot system into 5 subsystem:

- Iot device: It's an embedded system whose function is to collect data from sensors and send it to the sink node via traditional wireless communication standards such as Wifi, Zigbee, BLE, 3G/4G/5G, etc...
- Sink node: The sink node is used to collect data from different sensor nodes, therefore data collection is important issue in wireless sensor network.
- Gateway: Gateway is normally a microcontroller that integrates high-speed communication standards. Some commonly used microcontrollers are widely used for gateways of IoT systems such as esp 32, esp 8266,... Gateways act as bridges between sensors/devices and the cloud. The primary function of the gateway is collecting and processing data from the sink node and sending that data to the cloud through High-speed wireless communication standards like Wifi, 4G/5G…

- Cloud: The IoT cloud is a huge network that powers IoT devices and applications. This includes the underlying infrastructure, servers, and memory, required for real-time operations and processing.
- GUI software (Website/ Mobile Application): It monitor and control Iot devices on the user side (for a smartphone, PC)

2. Features of CSS, HTML, JAVASCRIPT.

The features of HTML:

- HTML stands for HyperText Markup Language.
- It is used to design the front end portion of web pages using markup language.
- It acts as a skeleton for a website since it is used to make the structure of a website.
- It is a markup language that is used by the browser to manipulate text, images, and other content to display in the required format.

The feature of CSS:

- Cascading Style Sheets fondly referred to as CSS is a simply designed language intended to simplify the process of making web pages presentable.
- It allows you to apply styles to web pages.
- It enables you to do this independent of the HTML that makes up each web page.

The feature of JAVASCRIPT:

- JavaScript is the world most popular lightweight, interpreted compiled programming language
- It is a scripting language used to provide a dynamic behavior to our website.
- It is well-known for the development of web pages, many non-browser environments also use it.
- It can be used for client-side developments as well as server-side developments.

3. What is HOSTING? DOMAIN? Give Example.

HOSTING	DOMAIN
• Hosting, in its most generic sense, is a service through which storage and computing resources are providing to an individual or organization for the accommodation and maintenance of one or more websites and related services.	• Domain is a location of a website • Domain names are used in various network contexts and for application-specific naming and addressing purposes. • Domain name a network domain or it represents an Internet protocol. •

• Service of hosting and maintaining a website. • Also known as web hosting, this is a divided storage space on the server so that users can share and host it. • Online data through the internet, where you can store website content or data on that space. • Example: Shared Hosting; VPS Hosting & Cloud Hosting; Dedicated Hosting.	• Example: https://online.hcmute.edu.vn; https://dkmh.hcmute.edu.vn; https://buihien224.github.io....

4. What is a gateway? The role of Gateway in the IoT System?

Gateway is normally a microcontroller that integrates high-speed communication standards. Some commonly used microcontrollers are widely used for gateways of IoT systems such as esp 32, esp 8266,... Gateways act as bridges between sensors/devices and the cloud. The primary function of the gateway is collecting and processing data from the sink node and sending that data to the cloud through High-speed wireless communication standards like Wifi, 4G/5G…

The role of Gateway in the Iot System is

- An IoT gateway acts as a network router, routing data between IoT devices and the cloud. Early on, most gateway devices only sent traffic in one direction: from the IoT devices to the cloud.
- Some IoT gateways do more than just route traffic. A gateway device can sometimes be used to preprocess that data locally at the edge before sending it to the cloud.
- It can provide additional security for the IoT network and the data it transports.

5. Read “IoT Solution for Smart City” and answer these questions:
    a. What does a smart city may involve?
    b. What can be measured?
    c. Applications of IoT technology for smart cities.

a A smart city may involve 4 main issues:

- **Environmental issues:** pollution, indoor/outdoor air pollution, noise levels, water quality, flood, spills,leaks, waste managament, etc…
- **Infrastructure facilities**: Buildings, parks and green areas,…

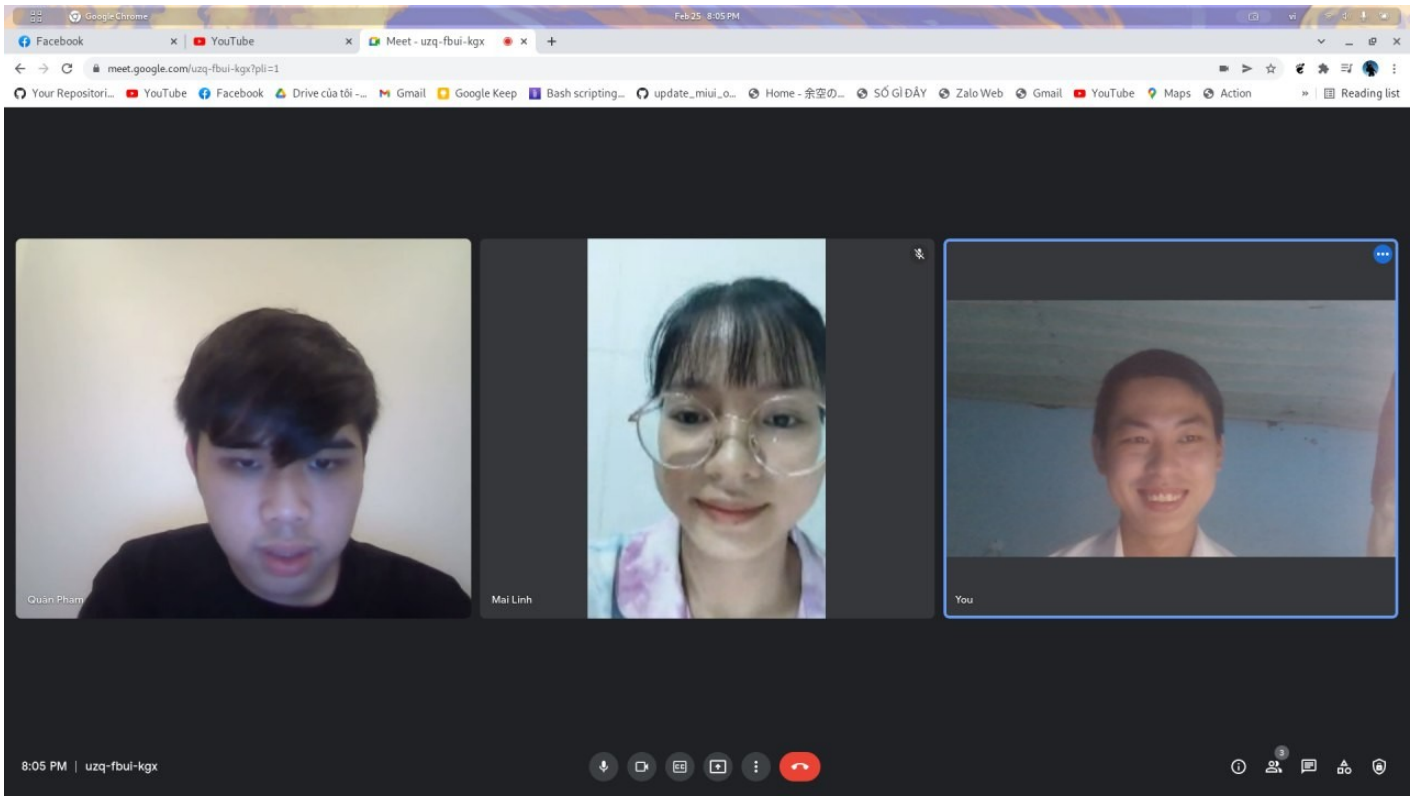
- **People:** Social distance and capacity control.
- **Traffic problems:** Traffic and mobility, public service vehicles, and public transport capacity.

b It can be measured:

- Air quality, pollution
- Noise levels
- Waste management
- Lighting
- Parking
- Buildings
- People
- Parks and green areas

c Some Applications of IoT technology for smart cities is:

- Smart Parking: It is a radar sensor device that allow the detection of parking availability indoors and outdoors.
- Smart Water: It allows remoter monitoring of the most relevant parameters related to water quality.
- Air quality station: It allows the monitorization of the AQI to controll pollution at cities and industries.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