Internet Applications

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طريقة الدخول للمقرر الدراسي عبر صفحة الانترنت


كليات الجامعة
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7		د / أحمد محمد ربيع سيد	تكنولوجيا المعلومات	مدرس

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تمهيدي ماجستير فنون تطبيق
Wireless and Mobile Netwo
Communication Terchnology
Inbternet Applications
Information Security

Course Description

المرفقات:

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Lecture 1

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رابط الموقع الشخصي

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Course Objectives

By the end of this course the student be able to:

1- Understand and apply the principles and practices of IOT technologies.
2- Identify the different Block chain implementations.
3- Understand IOT Network Architecture.
4- Provide education and training of Block chain elements.
5- Understand IOT access Technology.
6- Demonstrate different Block chain standards.
7- Explain IOT applications.
8- Understand Block chain in Healthcare.

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Securing IOT, IOT in Industry, Utilities.	6
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Course References

IOT Fundamentals: Networking Technologies, Protocols, and Use Cases for the Internet of Things, by David Hanes, Gonzalo Salgueiro , Patrick Grossetete , Robert Barton , Jerome Henry, Cisco Press, 2017.
Block chain Technology, Fundamentals, Applications and case studies, by Golden Julie, J. Jesu Vedha, Noor Zaman, CRC Press, 2021.
Oracle APEX 20 For Beginners by Riaz Ahmed, 2020.
Fundamentals of IoT and Wearable Technology Design, by Haider Raad, IEEE Press, 2021.
Understanding Oracle APEX 20 Application Development, by Edward Sciore, APress, 2020.

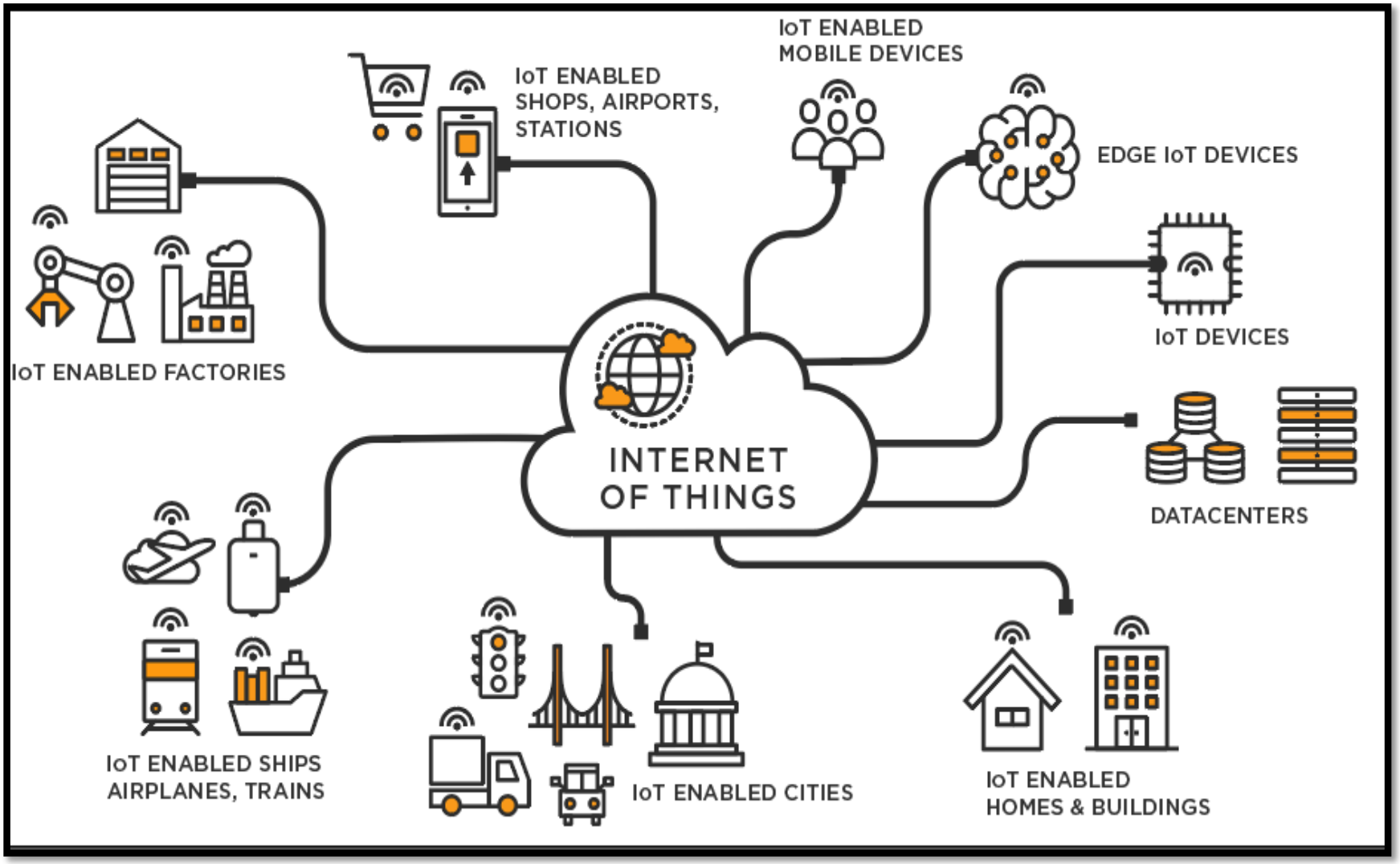
Chapter 1

Introduction

Internet ofThings

The internet of things, or IoT, is a system of interrelated computing devices, mechanical and digital machines, objects, animals or people that are provided with unique identifiers (UIDs) and the ability to transfer data over a network without requiring human-to-human or human-to-computer interaction.

A thing in the internet of things can be a person with a heart monitor implant, a farm animal with a biochip transponder, an automobile that has built-in sensors to alert the driver when tire pressure is low or any other natural or man-made object that can be assigned an Internet Protocol (IP) address and is able to transfer data over a network.


IoT ENABLED
MOBILE DEVICES
IoT ENABLED
SHOPS, AIRPORTS,
STATIONS
EDGE IoT DEVICES
IoT DEVICES
IoT ENABLED FACTORIES
INTERNET
OF THINGS
DATACENTERS
IoT ENABLED SHIPS
AIRPLANES, TRAINS
IoT ENABLED CITIES
IoT ENABLED
HOMES & BUILDINGS

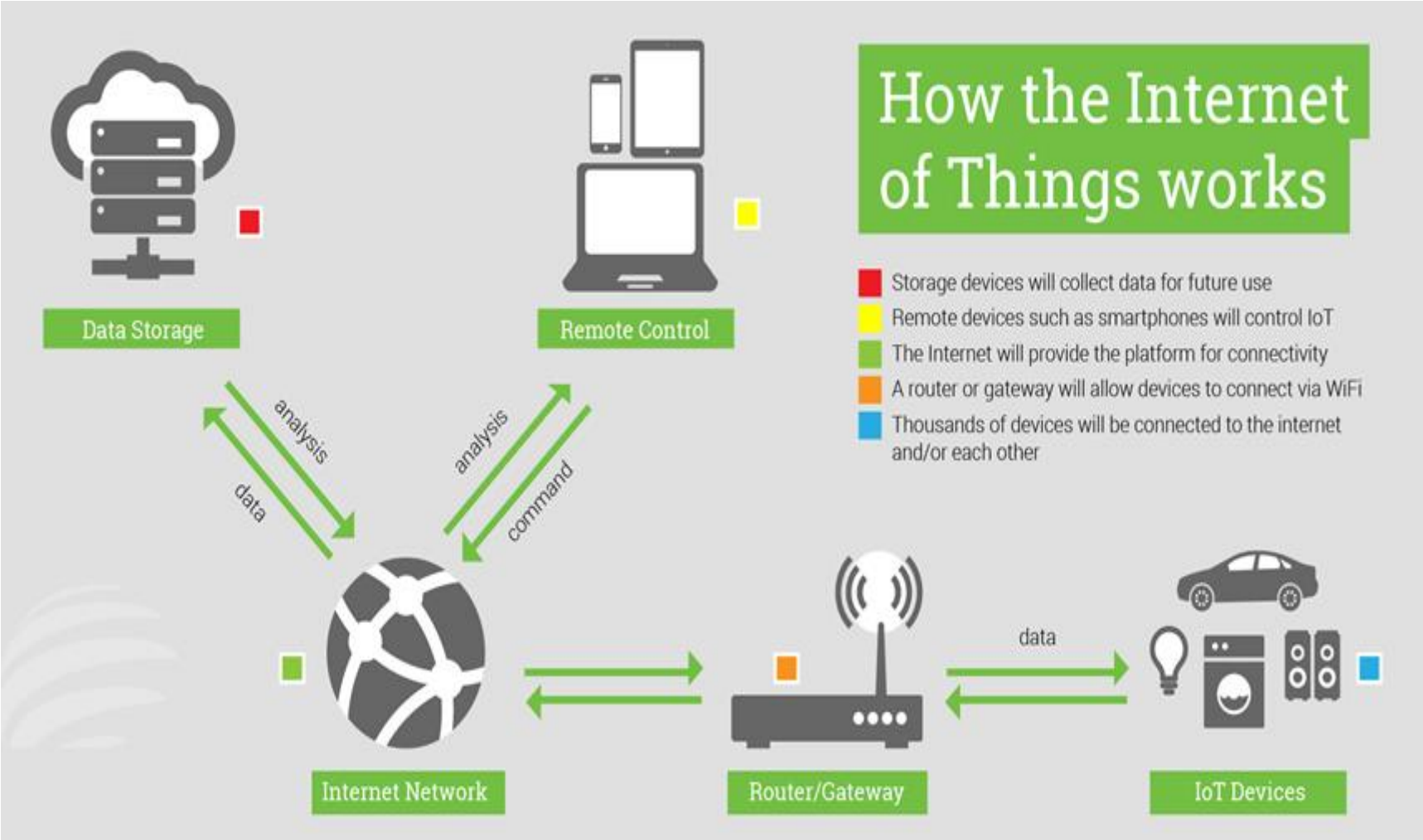
The basic premise and goal of IoT is to "connect the unconnected." This means that objects that are not currently joined to a computer network, namely the Internet, will be connected so that they can communicate and interact with people and other objects. IoT is a technology transition in which devices will allow us to sense and control the physical world by making objects smarter and connecting them through an intelligent network.

Increasingly, organizations in a variety of industries are using IoT to operate more efficiently, better understand customers to deliver enhanced customer service, improve decision-making and increase the value of the business. An IoT ecosystem consists of web-enabled smart devices that use embedded systems, such as processors, sensors and communication hardware, to collect, send and act on data they acquire from their environments.

In the context of IoT, digitization brings together things, data, and business process to make networked connections more relevant and valuable. A good example of this that many people can relate to is in the area of home automation with popular products.

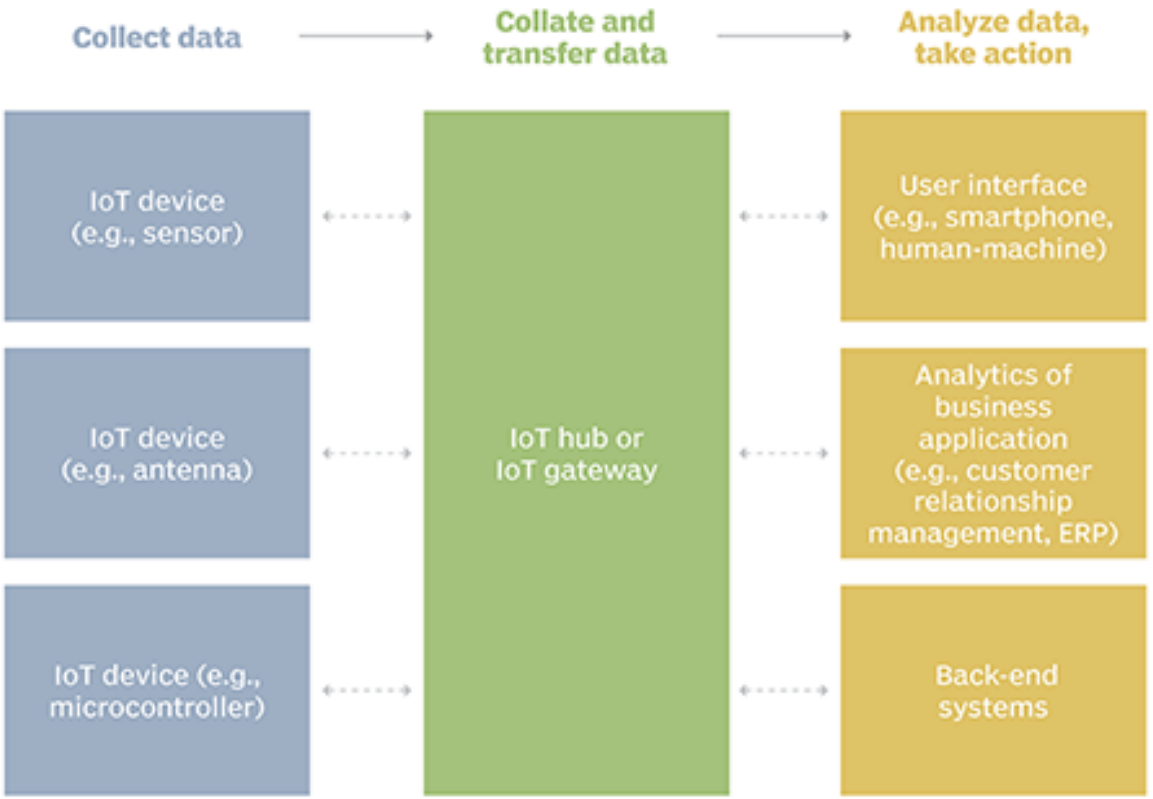
Companies today look at digitization as a differentiator for their businesses, and IoT is a prime enabler of digitization. Smart objects and increased connectivity drive digitization.

IoT devices share the sensor data they collect by connecting to an IoT gateway or other edge device where data is either sent to the cloud to be analyzed or analyzed locally. Sometimes, these devices communicate with other related devices and act on the information they get from one another. The devices do most of the work without human intervention, although people can interact with the devices -- for instance, to set them up, give them instructions or access the data.


How the Internet of Things works
Storage devices will collect data for future use
Remote devices such as smartphones will control IoT
The Internet will provide the platform for connectivity
A router or gateway will allow devices to connect via WiFi
Thousands of devices will be connected to the internet and/or each other
Data Storage
Remote Control
analysis
data
analysis
command
data
Internet Network
Router/Gateway
IoT Devices

The connectivity, networking and communication protocols used with these web-enabled devices largely depend on the specific IoT applications deployed. IoT can also make use of artificial intelligence (AI) and machine learning to aid in making data collecting processes easier and more dynamic.

Example of an IoT system



The internet of things helps people live and work smarter, as well as gain complete control over their lives. In addition to offering smart devices to automate homes, IoT is essential to business. IoT provides businesses with a real-time look into how their systems really work, delivering insights into everything from the performance of machines to supply chain and logistics operations.

IoT enables companies to automate processes and reduce labor costs. It also cuts down on waste and improves service delivery, making it less expensive to manufacture and deliver goods, as well as offering transparency into customer transactions. As such, IoT is one of the most important technologies of everyday life, and it will continue to pick up steam as more businesses realize the potential of connected devices to keep them competitive.

IoT is going to allow self-driving vehicles to better interact with the transportation system around them through bidirectional data exchanges while also providing important data to the riders. Self-driving vehicles need always-on, reliable communications and data from other transportation-related sensors to reach their full potential. *Connected roadways* is the term associated with both the driver and driverless cars fully integrating with the surrounding transportation infrastructure.

Google's Self-Driving Car

Basic sensors reside in cars already. They monitor oil pressure, tire pressure, temperature, and other operating conditions, and provide data around the core car functions. From behind the steering wheel, the driver can access this data while also controlling the car using equipment such as a steering wheel, pedals, and so on. The need for all this sensory information and control is obvious.

Information technology (IT) and operational technology (OT) have for the most part lived in separate worlds. IT supports connections to the Internet along with related data and technology systems and is focused on the secure flow of data across an organization. OT monitors and controls devices and processes on physical operational systems.

These systems include assembly lines, utility distribution networks, production facilities, roadway systems, and many more. Typically, IT did not get involved with the production and logistics of OT environments. IoT is forcing these groups to work together, when in the past they have operated rather autonomously.