Faculty of engineering - Shoubra
Benha University

Research Article / Research Project / Literature Review

in fulfillment of the requirements of

Department	**Engineering Mathematics and Physics**
Division	**----------**
Academic Year	**2019-2020 Preparatory**
Course name	**Computer**
Course code	**ECE001**

Title: -

Internet of Things

By:

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Approved by:

Examiners committee	Signature
Dr.Ahmed Bayoumi	
Dr.Shady Elmashad	
Dr. Abdelhamid Attaby	

Internet of Things

1-First page introduction:

A-Source code

```
<!DOCTYPE html>
<html>

    <head>

        <meta charset="utf-8">
        <meta name="description" content="What Is the Internet of Things and How Does It Affect You">
        <title>introduction Internet of Things</title>

    </head>

    <body >

        <center><h1> <b>Internet of Things<b> </h1></center>
            <center><img src="IOT.jpg" height="200"width="300"></center>
            <h2> we have many definitions about  <i>Internet of Things</i> :  </h2>
            <ol>
                <li> definition Ericsson about IOT </li>

                    <p>
                        A true Internet of Things will require IP in the tiniest devices that monitor or ontrol
                        real world objects, and that services and data from these devices are somehowavailable more
                        openly for applications to make use of.
                        The use of standard IP and Web technologies will ensure that device costs are driven down
                        and that application development and use will be significantly simplified .
                    </p>

                <li> definition Gartner about IOT</li>
```

```
            <li> definition Gartner about IOT</li>

                <p>
                    The Internet of Things (IoT) is the network of physical objects that contain
                    embedded technology to communicate and sense or interact with their internal states or the
                    external environment.
                    The IoT comprises an ecosystem that includes things,communication, applications and data
                    analysis .
                </p>

            <li>definition Cisco about IOT</li>
                <p>
                    The Internet of Everything (IoE) is bringing together people, process, data, and
                    things to make networked connections more relevant and valuable than ever beforeturning
                    information into actions that create new capabilities, richer experiences, and
                    unprecedented economic opportunity for businesses, individuals, and countries .
                </p>
        </ol>
        <h3>IoT is defined by ITU and IERC as : </h3>
        <img src="itu.png" alt="IoT is defined by ITU" width="600" height="400">
        <br>
        <br>
        <a href="History.html" target="_blank">History of IOT
        </a>



    </body>
</html>
```

Code in website

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</html>
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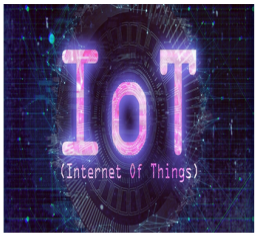
B- the page

Internet of Things



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3. **definition Cisco about IOT**

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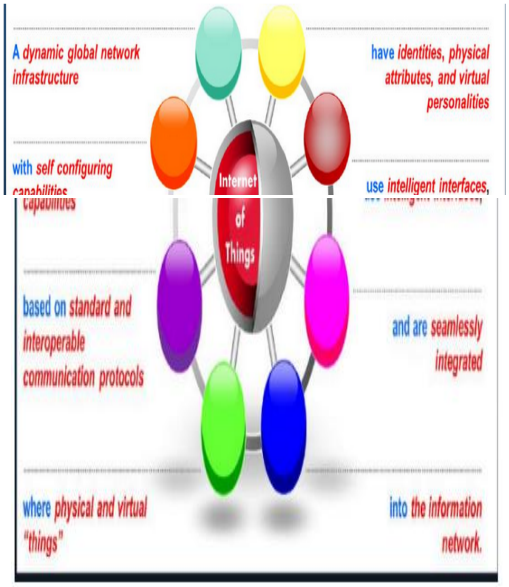

History of IOT

2-second page History of Internet Of Things:

A-Source code

```html
<!DOCTYPE html>
<html>

    <head>

        <meta charset="utf-8">
        <title>History</title>

    </head>
    <body>

        <center><h1>History of Internet Of Things</h1></center>
        <p>
            The main concept of a network of smart devices was discussed as early as 1982, with a modified Coca-Cola vending machine at Carnegie Mellon University becoming the first Internet-connected appliance, able to report its inventory and whether newly loaded drinks were cold or not.  Mark Weiser's 1991 paper on ubiquitous computing, "The Computer of the 21st Century", as well as academic venues such as UbiComp and PerCom produced the contemporary vision of the IoT.  In 1994, Reza Raji described the concept in IEEE Spectrum as "[moving] small packets of data to a large set of nodes, so as to integrate and automate everything from home appliances to entire factories".  Between 1993 and 1997, several companies proposed solutions like Microsoft's at Work or Novell's NEST. The field gained momentum when Bill Joy envisioned device-to-device communication as a part of his "Six Webs" framework, presented at the World Economic Forum at Davos in 1999.
        </p>
        <p>
            The term "Internet of things" was likely coined by Kevin Ashton of Procter & Gamble, later MIT's Auto-ID Center, in 1999, though he prefers the phrase "Internet for things".  At that point, he viewed radio-frequency identification (RFID) as essential to the Internet of things,  which would allow computers to manage all individual things.
        </p>
        <p>
            Defining the Internet of things as "simply the point in time when more 'things or objects' were connected to the Internet than people", Cisco Systems estimated that the IoT was "born" between 2008 and 2009, with the things/people ratio growing from 0.08 in 2003 to 1.84 in 2010.
        </p>

        <p>
            The key driving force behind the Internet of things is the MOSFET (metal-oxide-semiconductor field-effect transistor, or MOS transistor),  which was originally invented by Mohamed M. Atalla and Dawon Kahng at Bell Labs in 1959.  The MOSFET is the basic building block of most modern electronics, including computers, smartphones, tablets and Internet services. MOSFET scaling miniaturization at a pace predicted by Dennard scaling and Moore's law has been the driving force behind technological advances in the electronics industry since the late 20th century. MOSFET scaling has been extended into the early 21st century with advances such as reducing power consumption, silicon-on-insulator (SOI) semiconductor device fabrication, and multi-core processor technology, leading up to the Internet of things, which is being driven by MOSFETs scaling down to nanoelectronic levels with reducing energy consumption.
        </p>

        <h2>Birth of IoT</h2>
        <img src="birth of iot.png"alt="birth of iot" height="400" width="600">
        <br>
        <h3>The IOT Vision</h3>
        <a href="iot vision.html" target="_blnak">IOT Vision </a>
    </body>
</html>
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Code in website

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B- the page

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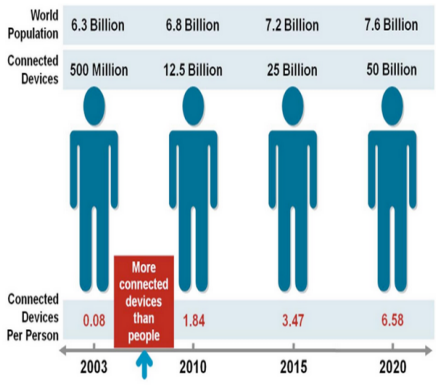
Birth of IoT



The IOT Vision

IOT Vision

3-third page IOT vision :

A-Source code

```
<!DOCTYPE html>
<html>

    <head>

        <meta charset="utf-8">
        <title>IOT vision</title>

    </head>
    <body>
        <h1>IOT vision </h1>
        <p>
            The IoT includes many objects (preferably smart
            objects) connected and communicating
            effectively with people on the Internet to help
            solve the problems of the world
        </p>
        <p>
            The end goal is to have plug-n-play smart objects that can be deployed in any environment with an interoperable interconnection backbone
            that allows them to blend with other smart objects around them. Standardization of frequency bands and protocols plays a pivotal role in
            accomplishing this goal.
        </p>
        <img src="vision.png"alt="IOT vision" height="400" width="600">
        <h2>IoT Today</h2>
        <ul>
            <li>Telecom Operators
                <ul>
                    <li>
                        Consider M2M and IoT major business focus
                    </li>
                </ul>

            </li>
            <li>Device manufacturers
                <ul>
                    <li>
                        Consider wearables a new product segment
                    </li>
                    </li>
                </ul>
            </li>
            <li>
                R&I communit
                <ul>
                    <li>
                        Invest in studying embedded and cyber-physical systems, network
                        technologies, semantic interoperability, operating systems,
                        security, cloud computing, future internet, big data and robotics
                    </li>
                </ul>

            </li>

        </ul>
        <h3>technology drivers and key application</h3>
        <p>
            A roadmap of key developments in IoT research, which includes the technology drivers and key application    outcomes expected in the next
            decade, is shown below:
        </p>
        <img src="vision1.jpg"alt="roadmap" width="600" height="400">
        <br>
        <h3>IoT Challenges</h3>
        <img src="IoT Challenges.png"alt="IoT Challenges" width="600" height="400">
        <br>
        <h3>IoT Tomorrow</h3>
        <ol>
            <li>
                Extend the current IoT into dynamically configured web
                of platforms for connected devices, objects, smart
                environments, services and persons
            </li>
            <li>
                    Overcome the fragmentation of vertically-oriented closed
                    systems, architectures and applications
                </li>
            </li>
        </ol>
        <br>
        <a href="main component.html" target="_blank">IoT Infrastructure Main Components</a>


    </body>
</html>
```

Code in website

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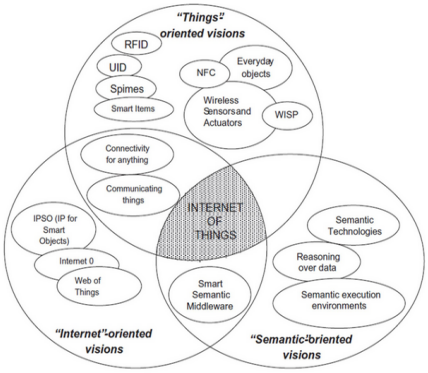
    </body>
</html>
```

B- the page

IOT vision

The IoT includes many objects (preferably smart objects) connected and communicating effectively with people on the Internet to help solve the problems of the world

The end goal is to have plug-n-play smart objects that can be deployed in any environment with an interoperable interconnection backbone that allows them to blend with other smart objects around them. Standardization of frequency bands and protocols plays a pivotal role in accomplishing this goal.



IoT Today

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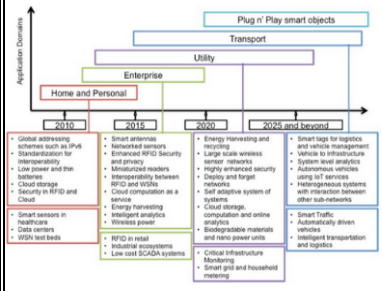
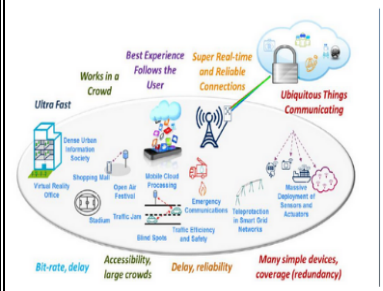


IoT Challenges



IoT Tomorrow

1. Extend the current IoT into dynamically configured web of platforms for connected devices, objects, smart environments, services and persons
2. Overcome the fragmentation of vertically-oriented closed systems, architectures and applications

IoT Infrastructure Main Components

4-fourth page IoT Infrastructure Main Components:

A-Source code

```
<!DOCTYPE html>
<html>

    <head>

        <meta charset="utf-8">
        <title>Component</title>

    </head>
    <body>
        <center><h1>IoT Infrastructure Main Components</h1></center>
        <table border="2" width="600"height="400">
            <tr>
                <td>Applications</td>
                <td>Social Media, Web,Mobile, Enterprise,Industrial</td>
            </tr>
            <tr>
                <td> Services</td>
                <td>Cloud Services
                    ,Security</td>
            </tr>
            <tr>
                <td>Middleware</td>
                <td>Data management,Context Management</td>
            </tr>
            <tr>
                <td>Connectivity</td>
                <td>Protocols teleco</td>

            </tr>
            <tr>
                <td>Things</td>
                <td>People,Microcontrollers,Sensors,Tagged Objects,Connected Devices</td>
            </tr>
        </table>
        <br>
        <h2>Component</h2>
        <ol>
            <li>Applications
                <ul>
                 <ul>
                    <li>smart cities</li>
                    <li>smart transport</li>
                    <li>smart building</li>
                    <li>smart health</li>
                 </ul>

            </li>
            <li>Services
                <ul>
                    <li>Cloud Services
                        <ul>
                            <li>Emerging Services: Sensing-as-a-service & Object-as-a-service</li>
                            <li>Moving towards Fog Computing Paradigm to cope with the need
                                for mobility, geo-distribution, context awareness and low latency</li>
                        </ul>
                    </li>
                </ul>
            </li>
            <li>Middleware
                <ul>
                    <li>Semantic Sensor Networks & Semantic Annotation of Data
                        <ul>
                            <li>Use semantic technologies to annotate sensors with spatial,
                                temporal semantic metadata</li>
                            <li>W3C Semantic Sensor Network Incubator Group is developing
                                sensor ontology</li>
                        </ul>
                    </li>
                </ul>
            </li>
            <li>Connectivity
                <ul>
                    <li>Main concern is low power communication
                        <ul>
                            <li>IEEE 802.15.4</li>
                            <li>Bluetooth LE (low energy)</li>
```

```
                        <li>Bluetooth LE (low energy)</li>
                        <li>RFID/NFC</li>
                    </ul>
                </li>
            </ul>
        </li>
        <li>Things
            <ul>
                <li>Embedded Systems</li>
                <li>Wireless Sensor Networks</li>
                <li>Photonics</li>
            </ul>


        </li>

    </ol>
    <br>
    <a href="Applications.html"target="_blank">click here to show Aplliction</a>

</body>
</html>
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code in website

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```

```
46
47          </li>
48          <li>Services
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86                <li>Photonics</li>
87             </ul>
88
89
90          </li>
91
92       </ol>
93       <br>
94       <a href="Applications.html"target="_blank">click here to show Aplliction</a>
95
96    </body>
97 </html>
```

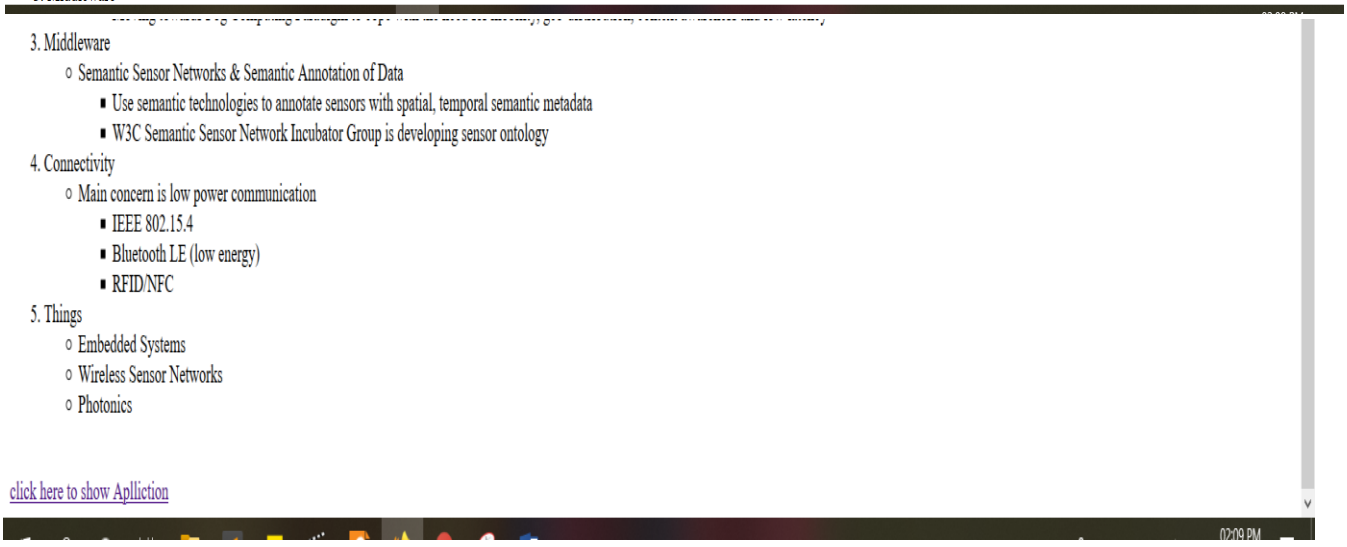
B- the page

IoT Infrastructure Main Components

Applications	Social Media, Web,Mobile, Enterprise,Industrial
Services	Cloud Services ,Security
Middleware	Data management,Context Management
Connectivity	Protocols teleco
Things	People,Microcontrollers,Sensors,Tagged Objects,Connected Devices

Component

1. Applications
   - smart cities
   - smart transport
   - smart building
   - smart health
2. Services
   - Cloud Services
     - Emerging Services: Sensing-as-a-service & Object-as-a-service
     - Moving towards Fog Computing Paradigm to cope with the need for mobility, geo-distribution, context awareness and low latency
3. Middleware



5-fifth page IoT Applications:

A-Source code

```
<!DOCTYPE html>
<html>

    <head>

        <meta charset="utf-8">
        <title>Applictions</title>

    </head>

    <body>
        <center><h1>IoT Applications</h1></center>
        <h2>The extensive set of applications for IoT devices is often divided into : </h2>
        <ol>
            <li>Consumer applications
                <ul>
                    <li>Smart home :
                        <p> IoT devices are a part of the larger concept of home automation, which can include lighting, heating and air conditioning, media and security systems. Long-term benefits could include energy savings by automatically ensuring lights and electronics are turned off.
                        </p>
                    </li>
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code in website

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    <head>

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    </head>

    <body>
        <center><h1>IoT Applications</h1></center>
        <h2>The extensive set of applications for IoT devices is often divided into : </h2>
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                    <li>Smart home :
                        <p> IoT devices are a part of the larger concept of home automation, which can include lighting, heating and air conditioning, media and security systen
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B- the page

IoT Applications

The extensive set of applications for IoT devices is often divided into :

1. Consumer applications
   - Smart home :

     IoT devices are a part of the larger concept of home automation, which can include lighting, heating and air conditioning, media and security systems. Long-term benefits could include energy savings by automatically ensuring lights and electronics are turned off.

   - Elder care :

     Voice control can assist users with sight and mobility limitations while alert systems can be connected directly to cochlear implants worn by hearing-impaired users.

2. Organisational applications
   - Medical and healthcare :

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Enabling technologies for IoT

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