



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:

	Name	Edu mail	B.N
1	Nasr mohamed Nasr	nasr196122@feng.bu.edu.eg	996

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></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>
```



Benha University
Faculty of Engineering - Shoubra
Academic year 2019-2020



```
<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 before returning 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>
```

```

```

```
<br>
```

```
<br>
```

```
<a href="History.html" target="_blank">History of IOT
```

```
</a>
```

```
</body>
```

```
</html>
```



Benha University
Faculty of Engineering - Shoubra
Academic year 2019-2020



Code in website

```
1 <!DOCTYPE html>
2 <html>
3
4 <head>
5
6 <meta charset="utf-8">
7 <meta name="description" content="What Is the Internet of Things and How Does It Affect You">
8 <title>introduction Internet of Things</title>
9
10 </head>
11
12 <body >
13
14 <center><h1> <b>Internet of Things<b> </h1></center>
15 <center></center>
16 <h2> we have many definitions about <i>Internet of Things</i> : </h2>
17 <ol>
18 <li> definition Ericsson about IOT </li>
19
20 <p>
21 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 ope
22 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 .
23 </p>
24
25 <li> definition Gartner about IOT</li>
26
27 <p>
28 The Internet of Things (IoT) is the network of physical objects that contain
29 embedded technology to communicate and sense or interact with their internal states or the external environment.
30 The IoT comprises an ecosystem that includes things,communication, applications and data analysis .
31 </p>
32
33 <li>definition Cisco about IOT</li>
34 <p>
35 The Internet of Everything (IoE) is bringing together people, process, data, and
36 things to make networked connections more relevant and valuable than ever beforereturning information into actions that create new capabilities, richer experiences, and unprecedented ec
37 </p>
38 </ol>
39 <h3>IoT is defined by ITU and IERC as : </h3>
40 
41 <br>
42 <br>
43 <a href="History.html" target="_blank">History of IOT
44 </a>
45
46
47
48 </body>
49 </html>
```



Benha University Faculty of Engineering - Shoubra Academic year 2019-2020



B- the page

Internet of Things



we have many definitions about *Internet of Things* :

1. definition Ericsson about IOT

A true Internet of Things will require IP in the tiniest devices that monitor or control real world objects, and that services and data from these devices are somehow available 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 .

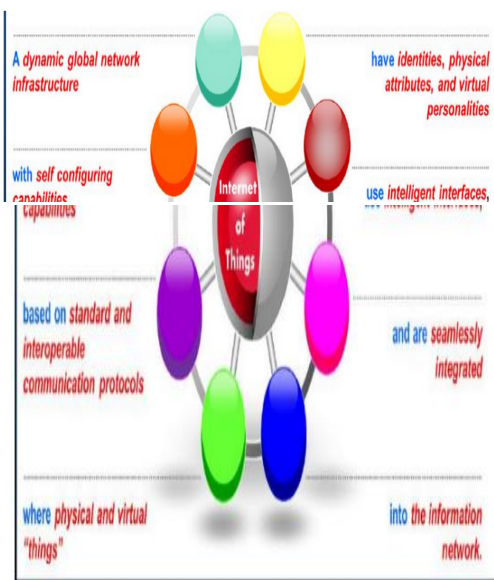
2. definition Gartner about IOT

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 .

3. definition Cisco about IOT

The Internet of Everything (IoE) is bringing together people, process, data, and things to make networked connections more relevant and valuable than ever before, returning information into actions that create new capabilities, richer experiences, and unprecedented economic opportunity for businesses, individuals, and countries .

IoT is defined by ITU and IERC as :



History of IOT



2-second page History of Internet Of Things:

A-Source code

```
1 <!DOCTYPE html>
2 <html>
3
4 <head>
5
6 <meta charset="utf-8">
7 <title>History</title>
8
9 </head>
10 <body>
11
12 <center><h1>History of Internet Of Things</h1></center>
13
14 <p>
15 The main concept of a network of smart devices was discussed as early as 1982, with a modified Coca-Cola vending machine at
16 Carnegie Mellon University becoming the first Internet-connected appliance, able to report its inventory and whether newly
17 loaded drinks were cold or not. Mark Weiser's 1991 paper on ubiquitous computing, "The Computer of the 21st Century", as well
18 as academic venues such as UbiComp and PerCom produced the contemporary vision of the IoT. In 1994, Reza Raji described the
19 concept in IEEE Spectrum as "[moving] small packets of data to a large set of nodes, so as to integrate and automate everything
20 from home appliances to entire factories". Between 1993 and 1997, several companies proposed solutions like Microsoft's at Work
21 or Novell's NEST. The field gained momentum when Bill Joy envisioned device-to-device communication as a part of his "Six Webs"
22 framework, presented at the World Economic Forum at Davos in 1999.
23
24 </p>
25
26 <p>
27 The term "Internet of things" was likely coined by Kevin Ashton of Procter & Gamble, later MIT's Auto-ID Center, in 1999, though
28 he prefers the phrase "Internet for things". At that point, he viewed radio-frequency identification (RFID) as essential to the
29 Internet of things, which would allow computers to manage all individual things.
30
31 </p>
32
33 <p>
34 Defining the Internet of things as "simply the point in time when more 'things or objects' were connected to the Internet than
35 people", Cisco Systems estimated that the IoT was "born" between 2008 and 2009, with the things/people ratio growing from 0.08
36 in 2003 to 1.84 in 2010.
37
38 </p>
39
40 <p>
41 The key driving force behind the Internet of things is the MOSFET (metal-oxide-semiconductor field-effect transistor, or MOS
42 transistor), which was originally invented by Mohamed M. Atalla and Dawon Kahng at Bell Labs in 1959. The MOSFET is the basic
43
44 </p>
45
46 <p>
47 The key driving force behind the Internet of things is the MOSFET (metal-oxide-semiconductor field-effect transistor, or MOS
48 transistor), which was originally invented by Mohamed M. Atalla and Dawon Kahng at Bell Labs in 1959. The MOSFET is the basic
49 building block of most modern electronics, including computers, smartphones, tablets and Internet services. MOSFET scaling
50 miniaturization at a pace predicted by Dennard scaling and Moore's law has been the driving force behind technological advances
51 in the electronics industry since the late 20th century. MOSFET scaling has been extended into the early 21st century with
52 advances such as reducing power consumption, silicon-on-insulator (SOI) semiconductor device fabrication, and multi-core
53 processor technology, leading up to the Internet of things, which is being driven by MOSFETs scaling down to nanoelectronic
54 levels with reducing energy consumption.
55
56 </p>
57
58 <h2>Birth of IoT</h2>
59 
60 <br>
61 <h3>The IOT Vision</h3>
62 <a href="iot vision.html" target="_blank">IOT Vision </a>
63 </body>
64 </html>
```



Benha University Faculty of Engineering - Shoubra Academic year 2019-2020



Code in website

```
1 <!DOCTYPE html>
2 <html>
3
4 <head>
5
6 <meta charset="utf-8">
7 <title>History</title>
8
9 </head>
10 <body>
11
12 <center><h1>History of Internet Of Things</h1></center>
13 <p>
14 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-
15 </p>
16 <p>
17 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
18 </p>
19 <p>
20 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 "I
21 </p>
22
23 <p>
24 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 Mohame
25 </p>
26
27 <h2>Birth of IoT</h2>
28 
29 <br>
30 <h3>The IOT Vision</h3>
31 <a href="iot vision.html" target="_blank">IOT Vision </a>
32 </body>
33 </html>
```




Benha University Faculty of Engineering - Shoubra Academic year 2019-2020



B- the page

History of Internet Of Things

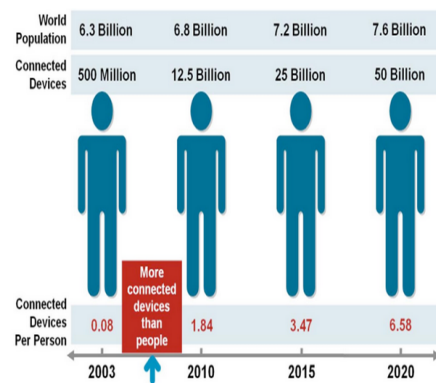
The main concept of a network of smart devices was discussed as early as 1982, with a modified Coca-Cola vending machine at Carnegie Mellon University becoming the first Internet-connected appliance, able to report its inventory and whether newly loaded drinks were cold or not. Mark Weiser's 1991 paper 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 part of his "Six Webs" framework, presented at the World Economic Forum at Davos in 1999.

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.

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.

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.

Birth of IoT



The IOT Vision

[IOT Vision](#)



3-third page IOT vision :

A-Source code

```
1 <!DOCTYPE html>
2 <html>
3
4 <head>
5
6 <meta charset="utf-8">
7 <title>IoT vision</title>
8
9 </head>
10 <body>
11 <h1>IoT vision </h1>
12 <p>
13 The IoT includes many objects (preferably smart
14 objects) connected and communicating
15 effectively with people on the Internet to help
16 solve the problems of the world
17 </p>
18 <p>
19 The end goal is to have plug-n-play smart objects that can be deployed in any environment with an interoperable interconnection backbone
20 that allows them to blend with other smart objects around them. Standardization of frequency bands and protocols plays a pivotal role in
21 accomplishing this goal.
22 </p>
23 
24 <h2>IoT Today</h2>
25 <ul>
26 <li>Telecom Operators
27 <ul>
28 <li>Consider M2M and IoT major business focus
29 </li>
30 </ul>
31 </li>
32 <li>Device manufacturers
33 <ul>
34 <li>Consider wearables a new product segment
35 </li>
36 </ul>
37 </li>
38 </ul>
39 <li>R&I communit
40 <ul>
41 <li>Invest in studying embedded and cyber-physical systems, network
42 technologies, semantic interoperability, operating systems,
43 security, cloud computing, future internet, big data and robotics
44 </li>
45 </ul>
46 </li>
47 </ul>
48 <h3>technology drivers and key application</h3>
49 <p>
50 A roadmap of key developments in IoT research, which includes the technology drivers and key application outcomes expected in the next
51 decade, is shown below:
52 </p>
53 
54 <br>
55 
56 <br>
57 <h3>IoT Tomorrow</h3>
58 <ol>
59 <li>Extend the current IoT into dynamically configured web
60 of platforms for connected devices, objects, smart
61 environments, services and persons
62 </li>
63 <li>Overcome the fragmentation of vertically-oriented closed
64 systems, architectures and applications
65 </li>
66 </ol>
67 <br>
68 <a href="main component.html" target="_blank">IoT Infrastructure Main Components</a>
69
70 </body>
71 </html>
```



Code in website

```
1 <!DOCTYPE html>
2 <html>
3
4 <head>
5
6 <meta charset="utf-8">
7 <title>IoT vision</title>
8
9 </head>
10 <body>
11 <h1>IoT vision </h1>
12 <p>
13 The IoT includes many objects (preferably smart
14 objects) connected and communicating
15 effectively with people on the Internet to help
16 solve the problems of the world
17 </p>
18 <p>
19 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 sma
20 </p>
21 
22 <h2>IoT Today</h2>
23 <ul>
24 <li>Telecom Operators
25 <ul>
26 <li>
27 Consider M2M and IoT major business focus
28 </li>
29 </ul>
30 </li>
31 <li>Device manufacturers
32 <ul>
33 <li>
34 Consider wearables a new product segment
35 </li>
36 </ul>
37 </li>
38 <li>
39 R&I communit
40 <ul>
41 <li>
42 Invest in studying embedded and cyber-physical systems, network
43 technologies, semantic interoperability, operating systems,
44 security, cloud computing, future internet, big data and robotics
45 </li>
46 </ul>
47 </li>
48
49 </li>
50
51 </ul>
52 <h3>technology drivers and key application</h3>
53 <p>
54 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:
55 </p>
56 
57 <br>
58 <h3>IoT Challenges</h3>
59 
60 <br>
61 <h3>IoT Tomorrow</h3>
62 <ol>
63 <li>
64 Extend the current IoT into dynamically configured web
65 of platforms for connected devices, objects, smart
66 environments, services and persons
67 </li>
68 <li>
69 Overcome the fragmentation of vertically-oriented closed
70 systems, architectures and applications
71 </li>
72 </ol>
73 <br>
74 <a href="main component.html" target="_blank">IoT Infrastructure Main Components</a>
75
76
77 </body>
78 </html>
```



Benha University Faculty of Engineering - Shoubra Academic year 2019-2020

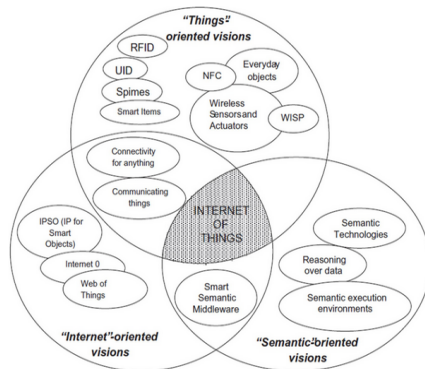


B- the page

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.

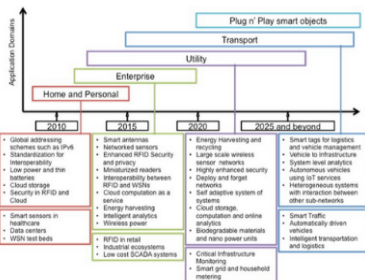


IoT Today

- Telecom Operators
 - Consider M2M and IoT major business focus
- Device manufacturers
 - Consider wearables a new product segment
- R&D community
 - Invest in studying embedded and cyber-physical systems, network technologies, semantic interoperability, operating systems, security, cloud computing, future internet, big data and robotics

technology drivers and key application

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:



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

```
1  <!DOCTYPE html>
2  <html>
3
4      <head>
5
6          <meta charset="utf-8">
7          <title>Component</title>
8
9      </head>
10     <body>
11         <center><h1>IoT Infrastructure Main Components</h1></center>
12         <table border="2" width="600" height="400">
13             <tr>
14                 <td>Applications</td>
15                 <td>Social Media, Web, Mobile, Enterprise, Industrial</td>
16             </tr>
17             <tr>
18                 <td>Services</td>
19                 <td>Cloud Services
20                     , Security</td>
21             </tr>
22             <tr>
23                 <td>Middleware</td>
24                 <td>Data management, Context Management</td>
25             </tr>
26             <tr>
27                 <td>Connectivity</td>
28                 <td>Protocols teleco</td>
29             </tr>
30             <tr>
31                 <td>Things</td>
32                 <td>People, Microcontrollers, Sensors, Tagged Objects, Connected Devices</td>
33             </tr>
34         </table>
35         <br>
36         <h2>Component</h2>
37         <ol>
38             <li>Applications
39                 <ul>
40                     <li>smart cities</li>
41                     <li>smart transport</li>
42                     <li>smart building</li>
43                     <li>smart health</li>
44                 </ul>
45             </li>
46             <li>Services
47                 <ul>
48                     <li>Cloud Services
49                         <ul>
50                             <li>Emerging Services: Sensing-as-a-service & Object-as-a-service</li>
51                             <li>Moving towards Fog Computing Paradigm to cope with the need
52                                 for mobility, geo-distribution, context awareness and low latency</li>
53                         </ul>
54                     </li>
55                 </ul>
56             </li>
57             <li>Middleware
58                 <ul>
59                     <li>Semantic Sensor Networks & Semantic Annotation of Data
60                         <ul>
61                             <li>Use semantic technologies to annotate sensors with spatial,
62                                 temporal semantic metadata</li>
63                             <li>W3C Semantic Sensor Network Incubator Group is developing
64                                 sensor ontology</li>
65                         </ul>
66                     </li>
67                 </ul>
68             </li>
69             <li>Connectivity
70                 <ul>
71                     <li>Main concern is low power communication
72                         <ul>
73                             <li>IEEE 802.15.4</li>
74                             <li>Bluetooth LE (low energy)</li>
75                         </ul>
76                     </li>
77                 </ul>
78             </li>
79         </ol>
80     </body>
81 </html>
```



Benha University
Faculty of Engineering - Shoubra
Academic year 2019-2020



```
76         <li>Bluetooth LE (low energy)</li>
77         <li>RFID/NFC</li>
78     </ul>
79 </li>
80 </ul>
81 </li>
82 <li>Things
83     <ul>
84         <li>Embedded Systems</li>
85         <li>Wireless Sensor Networks</li>
86         <li>Photonics</li>
87     </ul>
88 </li>
89
90 </li>
91
92 </ol>
93 <br>
94 <a href="Applications.html" target="_blank">click here to show Aplication</a>
95
96 </body>
97 </html>
```

code in website

```
1 <!DOCTYPE html>
2 <html>
3
4     <head>
5
6         <meta charset="utf-8">
7         <title>Component</title>
8
9     </head>
10    <body>
11        <center><h1>IoT Infrastructure Main Components</h1></center>
12        <table border="2" width="600" height="400">
13            <tr>
14                <td>Applications</td>
15                <td>Social Media, Web, Mobile, Enterprise, Industrial</td>
16            </tr>
17            <tr>
18                <td>Services</td>
19                <td>Cloud Services
20                    , Security</td>
21            </tr>
22            <tr>
23                <td>Middleware</td>
24                <td>Data management, Context Management</td>
25            </tr>
26            <tr>
27                <td>Connectivity</td>
28                <td>Protocols teleco</td>
29            </tr>
30            <tr>
31                <td>Things</td>
32                <td>People, Microcontrollers, Sensors, Tagged Objects, Connected Devices</td>
33            </tr>
34        </table>
35        <br>
36        <h2>Component</h2>
37        <ol>
38            <li>Applications
39                <ul>
40                    <li>smart cities</li>
41                    <li>smart transport</li>
42                    <li>smart building</li>
43                    <li>smart health</li>
44                </ul>
45            </li>
46        </ol>
```



Benha University
Faculty of Engineering - Shoubra
Academic year 2019-2020



```
46
47
48 <li>Services
49   <ul>
50     <li>Cloud Services
51       <ul>
52         <li>Emerging Services: Sensing-as-a-service & Object-as-a-service</li>
53         <li>Moving towards Fog Computing Paradigm to cope with the need
54           for mobility, geo-distribution, context awareness and low latency</li>
55       </ul>
56     </li>
57   </ul>
58 </li>
59 <li>Middleware
60   <ul>
61     <li>Semantic Sensor Networks & Semantic Annotation of Data
62       <ul>
63         <li>Use semantic technologies to annotate sensors with spatial,
64           temporal semantic metadata</li>
65         <li>W3C Semantic Sensor Network Incubator Group is developing
66           sensor ontology</li>
67       </ul>
68     </li>
69   </ul>
70 </li>
71 <li>Connectivity
72   <ul>
73     <li>Main concern is low power communication
74       <ul>
75         <li>IEEE 802.15.4</li>
76         <li>Bluetooth LE (low energy)</li>
77         <li>RFID/NFC</li>
78       </ul>
79     </li>
80   </ul>
81 </li>
82 <li>Things
83   <ul>
84     <li>Embedded Systems</li>
85     <li>Wireless Sensor Networks</li>
86     <li>Photonics</li>
87   </ul>
88
89 </li>
90
91 </ol>
92 <br>
93 <a href="Applications.html" target="_blank">click here to show Application</a>
94
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

3. Middleware
 - Semantic Sensor Networks & Semantic Annotation of Data
 - Use semantic technologies to annotate sensors with spatial, temporal semantic metadata
 - W3C Semantic Sensor Network Incubator Group is developing sensor ontology
4. Connectivity
 - Main concern is low power communication
 - IEEE 802.15.4
 - Bluetooth LE (low energy)
 - RFID/NFC
5. Things
 - Embedded Systems
 - Wireless Sensor Networks
 - Photonics

[click here to show Application](#)

02:09 PM



5-fifth page IoT Applications:

A-Source code

```
1 <!DOCTYPE html>
2 <html>
3
4 <head>
5
6 <meta charset="utf-8">
7 <title>Applications</title>
8
9 </head>
10
11 <body>
12 <center><h1>IoT Applications</h1></center>
13 <h2>The extensive set of applications for IoT devices is often divided into : </h2>
14 <ol>
15 <li>Consumer applications
16 <ul>
17 <li>Smart home :
18 <p> IoT devices are a part of the larger concept of home automation, which can include lighting, heating and
19 air conditioning, media and security systems. Long-term benefits could include energy savings by automatically ensuring
20 lights and electronics are turned off.
21 </p>
22 </li>
23 <li>Elder care :
24 <p>
25 Voice control can assist users with sight and mobility limitations while alert systems can be connected directly to
26 cochlear implants worn by hearing-impaired users.
27 </p>
28 </li>
29 </ul>
30 <li>Organisational applications
31 <ul>
32 <li>Medical and healthcare :
33 <p>
34 IoT devices can be used to enable remote health monitoring and emergency notification systems. These health monitoring
35 devices can range from blood pressure and heart rate monitors to advanced devices capable of monitoring specialized
36 implants, such as pacemakers, Fitbit electronic wristbands, or advanced hearing aids.
37 </p>
38 </li>
39 <li>Transportation :
40 <p>
41 The IoT can assist in the integration of communications, control, and information processing across various transportation
42 systems. Application of the IoT extends to all aspects of transportation systems (i.e. the vehicle, the infrastructure, and the
43 driver or user). Dynamic interaction between these components of a transport system enables inter- and intra-vehicular
44 communication, smart traffic control, smart parking, electronic toll collection systems, logistics and fleet management, vehicle
45 control, safety, and road assistance.
46 </p>
47 </li>
48 </ul>
49 <li>Industrial applications
50 <ul>
51 <li>Manufacturing :
52 <p>
53 The IoT can realize the seamless integration of various manufacturing devices equipped with sensing, identification, processing,
54 communication, actuation, and networking capabilities. Based on such a highly integrated smart cyber-physical space, it opens the
55 door to create whole new business and market opportunities for manufacturing. Network control and management of manufacturing
56 equipment, asset and situation management, or manufacturing process control bring the IoT within the realm of industrial
57 applications, and smart manufacturing as well. The IoT intelligent systems enable rapid manufacturing of new products, dynamic
58 response to product demands, and real-time optimization of manufacturing production and supply chain networks, by networking
59 machinery, sensors and control systems together.
60 </p>
61 </li>
62 <li>Agriculture :
63 <p>
64 There are numerous IoT applications in farming such as collecting data on temperature, rainfall, humidity, wind speed, pest
65 infestation, and soil content. This data can be used to automate farming techniques, take informed decisions to improve quality
66 and quantity, minimize risk and waste, and reduce effort required to manage crops. For example, farmers can now monitor soil
67 temperature and moisture from afar, and even apply IoT-acquired data to precision fertilization programs.
68 </p>
69 </li>
70 </ul>
71 </li>
72 </ol>
73 </body>
74 </html>
```



Benha University
Faculty of Engineering - Shoubra
Academic year 2019-2020



```
57         </li>
58     </ul>
59
60     </li>
61 </ol>
62 <br>
63 <h2>Enabling technologies for IoT</h2>
64 <ol>
65     <li>Short-range wireless
66         <ul>
67             <li>Bluetooth mesh networking</li>
68             <li>Light-Fidelity</li>
69             <li>Near-field communication</li>
70             <li>Radio-frequency identification (RFID) </li>
71         </ul>
72     </li>
73
74     <li>
75     <li>Medium-range wireless
76         <ul>
77             <li>LTE-Advanced</li>
78             <li>5G</li>
79         </ul>
80     </li>
81
82     <li>
83     <li>Long-range wireless
84         <ul>
85             <li>Low-power wide-area networking</li>
86             <li>Very small aperture terminal</li>
87         </ul>
88     </li>
89
90     <li>
91     <li>Standards and standards organizations
92         <p>
93         This is a list of technical standards for the IoT, most of which are open standards, and the standards organizations that aspire to
94         successfully setting them.
95
96         </p>
97         <table border="2" width="700" height="500">
98             <tr>
99                 <td>Name</td>
100                 <td>Standards under development</td>
101             </tr>
102             <tr>
103                 <td>Auto Identification Center</td>
104                 <td>Networked RFID (radiofrequency identification) and emerging sensing technologies</td>
105             </tr>
106             <tr>
107                 <td>Electronic Product code Technology</td>
108                 <td>Standards for adoption of EPC (Electronic Product Code) technology</td>
109             </tr>
110             <tr>
111                 <td>Internet Engineering Task Force</td>
112                 <td>Standards that comprise TCP/IP (the Internet protocol suite)</td>
113             </tr>
114             <tr>
115                 <td>Open Mobile Alliance </td>
116                 <td>OMA DM and OMA LWM2M for IoT device management, as well as GotAPI, which provides a secure framework for IoT applications </td>
117             </tr>
118         </table>
119
120     </li>
121 </ol>
122
123 </body>
124 </html>
125
```



Benha University

Faculty of Engineering - Shoubra

Academic year 2019-2020



code in website

```
1 <!DOCTYPE html>
2 <html>
3
4   <head>
5
6     <meta charset="utf-8">
7     <title>Applications</title>
8
9   </head>
10
11   <body>
12     <center><h1>IoT Applications</h1></center>
13     <h2>The extensive set of applications for IoT devices is often divided into : </h2>
14     <ol>
15       <li>Consumer applications
16         <ul>
17           <li>Smart home :
18             <p>IoT devices are a part of the larger concept of home automation, which can include lighting, heating and air conditioning, media and security system</p>
19             </li>
20           <li>Elder care :
21             <p>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</p>
22             </li>
23         </ul>
24       </li>
25       <li>Organisational applications
26         <ul>
27           <li>Medical and healthcare :
28             <p>IoT devices can be used to enable remote health monitoring and emergency notification systems. These health monitoring devices can range from blood pressure and heart rate monitors to wearable devices</p>
29             </li>
30           <li>Transportation :
31             <p>The IoT can assist in the integration of communications, control, and information processing across various transportation systems. Application of the IoT extends to vehicle-to-vehicle (V2V) communication, vehicle-to-infrastructure (V2I) communication, and vehicle-to-pedestrian (V2P) communication</p>
32             </li>
33         </ul>
34       </li>
35       <li>Industrial applications
36         <ul>
37           <li>Manufacturing :
38             <p>The IoT can realize the seamless integration of various manufacturing devices equipped with sensing, identification, processing, communication, actuation, and network</p>
39             </li>
40           <li>Agriculture :
41             <p>There are numerous IoT applications in farming such as collecting data on temperature, rainfall, humidity, wind speed, pest infestation, and soil content. This data can be used to optimize crop yields and reduce resource waste</p>
42             </li>
43         </ul>
44       </li>
45     </ol>
46
47     <h2>Enabling technologies for IoT</h2>
48     <ol>
49       <li>Short-range wireless
50         <ul>
51           <li>Bluetooth mesh networking</li>
52           <li>Light-Fidelity</li>
53           <li>Near-field communication</li>
54           <li>Radio-frequency identification (RFID)</li>
55         </ul>
56       </li>
57       <li>Medium-range wireless
58         <ul>
59           <li>LTE-Advanced</li>
60           <li>5G</li>
61         </ul>
62       </li>
63       <li>Long-range wireless
64         <ul>
65           <li>Low-power wide-area networking</li>
66           <li>Very small aperture terminal</li>
67         </ul>
68       </li>
69     </ol>
70
71     <li>Standards and standards organizations
72       <p>This is a list of technical standards for the IoT, most of which are open standards, and the standards organizations that aspire to successfully setting them.</p>
73     </li>
74   </body>
75 </html>
```



Benha University Faculty of Engineering - Shoubra Academic year 2019-2020



```
95     </p>
96     <table border="2" width="700" height="500">
97     <tr>
98         <td>Name</td>
99         <td>Standards under development</td>
100    </tr>
101    <tr>
102        <td>Auto Identification Center</td>
103        <td>Networked RFID (radiofrequency identification) and emerging sensing technologies</td>
104    </tr>
105    <tr>
106        <td>Electronic Product code Technology</td>
107        <td>Standards for adoption of EPC (Electronic Product Code) technology</td>
108    </tr>
109    <tr>
110        <td>Internet Engineering Task Force</td>
111        <td>Standards that comprise TCP/IP (the Internet protocol suite)</td>
112    </tr>
113    <tr>
114        <td>Open Mobile Alliance </td>
115        <td>OMA TM and OMA LWM2M for IoT device management, as well as GotAPI, which provides a secure framework for IoT applications </td>
116    </tr>
117    </table>
118    </li>
119    </ol>
120    </li>
121    </ol>
122    </body>
123    </html>
124    </html>
125
```

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 :

IoT devices can be used to enable remote health monitoring and emergency notification systems. These health monitoring devices can range from blood pressure and heart rate monitors to advanced devices capable of monitoring specialized implants, such as pacemakers, Fitbit electronic wristbands, or advanced hearing aids.

◦ Transportation :

The IoT can assist in the integration of communications, control, and information processing across various transportation systems. Application of the IoT extends to all aspects of transportation systems (i.e. the vehicle, the infrastructure, and the driver or user). Dynamic interaction between these components of a transport system enables inter- and intra-vehicular communication, smart traffic control, smart parking, electronic toll collection systems, logistics and fleet management, vehicle control, safety, and road assistance.

3. Industrial applications

◦ Manufacturing :

The IoT can realize the seamless integration of various manufacturing devices equipped with sensing, identification, processing, communication, actuation, and networking capabilities. Based on such a highly integrated smart cyber-physical space, it opens the door to create whole new business and market opportunities for manufacturing. Network control and management of manufacturing equipment, asset and situation management, or manufacturing process control bring the IoT within the realm of industrial applications and smart manufacturing as well. The IoT intelligent systems enable rapid manufacturing of new products, dynamic response to product demands, and real-time optimization of manufacturing production and supply chain networks, by networking machinery, sensors and control systems together.

◦ Agriculture :

There are numerous IoT applications in farming such as collecting data on temperature, rainfall, humidity, wind speed, pest infestation, and soil content. This data can be used to automate farming techniques, take informed decisions to improve quality and quantity, minimize risk and waste, and reduce effort required to manage crops. For example, farmers can now monitor soil temperature and moisture from afar, and even apply IoT-acquired data to precision fertilization programs.



Benha University
Faculty of Engineering - Shoubra
Academic year 2019-2020



Enabling technologies for IoT

1. Short-range wireless
 - Bluetooth mesh networking
 - Light-Fidelity
 - Near-field communication
 - Radio-frequency identification (RFID)
2. Medium-range wireless
 - LTE-Advanced
 - 5G
3. Long-range wireless
 - Low-power wide-area networking
 - Very small aperture terminal
4. Standards and standards organizations

This is a list of technical standards for the IoT, most of which are open standards, and the standards organizations that aspire to successfully setting them.

Name	Standards under development
Auto Identification Center	Networked RFID (radiofrequency identification) and emerging sensing technologies
Electronic Product code Technology	Standards for adoption of EPC (Electronic Product Code) technology
Internet Engineering Task Force	Standards that comprise TCP/IP (the Internet protocol suite)
Open Mobile Alliance	OMA DM and OMA LWM2M for IoT device management, as well as GotAPI, which provides a secure framework for IoT applications

