

A SURVEY ON APPLICATIONS OF INTERNET OF THINGS

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Abstract : The Internet of things (IoT) is the network of devices, vehicles, and home appliances that contain , software, actuators and connectivity which allows these things to connect, interact and exchange data .Internet of Things finds number of applications in different areas like Smart Home, Wearables,Connected Cars, Industrial Internet, Smart Cities,IoT in Agriculture,Smart Retail,Energy Engagement,IOT in Health Care,IOT in Poultry and Farming .The purpose of this paper is to abstract applications provided by the Internet of Things (IoT)

Keywords- Wearables , Smart Home, connected Cars

1. Wearables

Internet of Things (IoT) is powerful technology with potential of making every physical object a powerhouse of data. The sensors today can today be placed in anywhere in our clothes, watches, glasses etc. making individuals a critical source of data. While the potential of this technology is immense the adoption, scale and development of IoT are hindered because of many challenges. These include privacy and security issues, limited hardware capabilities, software and firmware issues, public acceptance etc.

A wearable device is used for tracking a user's vital signs or pieces of data related to health and fitness, location or even his/her biofeedback indicating emotions of the human. Wearable device models may rely on limited wireless systems such as Bluetooth or local Wi-Fi setups.



2. IOT in Health Care

The healthcare industry has been quick in adopting connected medical devices they can help providers offer a better standard of care while also improving efficiency and lowering operational costs. One of the major applications for IoT in the healthcare sphere is wearable devices that allow for remote monitoring of different vital signs and health stats. Wearable healthcare devices allow providers and facilities to stay connected to patients, consumers and themselves to a gain better visibility into their health.

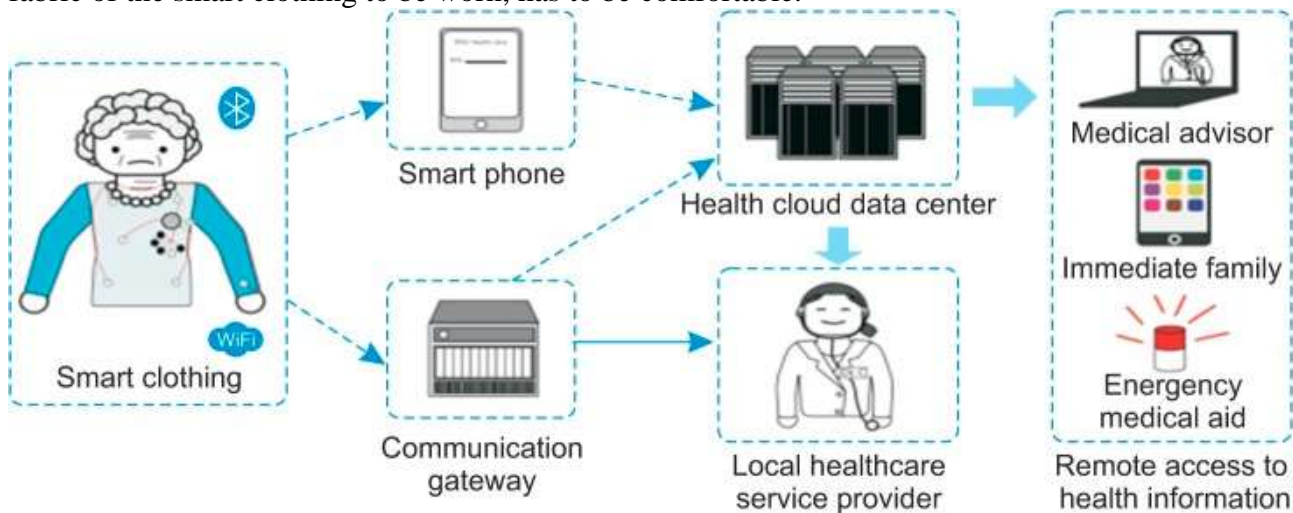
Perhaps the greatest benefit of IoT-enabled wearable healthcare devices is that they provide individual human with the information they need to gain better control over their health issue outcomes. Wearable devices are in high demand because they offer greater visibility into their health status, allowing them to make more informed decisions about their health:

- Individuals can monitor different fitness, health, and wellness factors to track progress towards their health goals.
- Those with health conditions that need to be closely monitored can use a wearable device to track

important health indicators on a day-to-day basis.

- Patients can share data from their wearable devices with their healthcare providers to provide physicians and other medical staff with a more detailed understanding of conditions.
- Consumers can also connect their devices to social networks, which helps them motivate one another toward healthier living.

In smart clothing, all sensors which are used to measure the vital signs are integrated into textile clothing. Sensor placement is a critical point that has to be performed properly. To provide efficiency and a well-formed design, the quality of the used sensors, proper positioning, layout of flexible electricity cable, weak signal acquisition equipment, low-power wireless communications, and user comfort are crucial factors. The fabric of the smart clothing to be worn, has to be comfortable.



3. SMART CITY

A smart city is a municipality that uses information and communication technologies to increase operational efficiency that share information with the public and improve both the quality of government services and citizen welfare.

Smart city initiatives also aim to monitor and address environmental concerns such as climate change and air pollution. Sanitation can also be improved with smart technology, be it using internet-connected trash cans and IoT-enabled fleet management systems for waste collection and removal, or using sensors to measure water parameters and guarantee the quality of drinking water at the front end of the system, with proper wastewater removal and drainage at the back end.



Smart city technology is increasingly being used to improve public safety, from monitoring areas of high crime to improving emergency preparedness with sensors. For example, smart sensors can be critical components of an early warning system before droughts, floods, landslides or hurricanes

4. SMART HOME

A smart home is one in which the various electric and electronic appliances are wired up to a central computer control system so they can either be switched on and off at certain times. EXAMPLE:- Heating can be set to come on automatically at 6:00AM on winter mornings or if certain events happen (lights can be set to come on only when a photoelectric sensor detects that it's dark).



How do smart homes work

The central controller sends regular switching signals through the ordinary household wiring, effectively treating it as a kind of computer network. Because these signals work at roughly twice the switching frequency of ordinary AC power (which works at 50–60Hz), they don't interfere with it in any way.

EXAMPLE:-plug-in modules and household electricity

Benefits for smart home

- Managing all of your home devices from one place. The convenience factor here is enormous. ...
- Flexibility for new devices and appliances. ...
- Maximizing home security. ...
- Remote control of home functions. ...
- Increased energy efficiency. ...
- Improved appliance functionality. ...
- Home management insights.

5. CONNECTED CARS



Predictive

The fact is, most electric cars are connected cars – connected through the Internet of Things. This means that sensors in the car constantly communicate with mission control (the manufacturer), sending data on the status of components in real time.

EXAMPLE:-After realizing component failure is imminent, your car could also trigger a work order at the dealership to resolve the issue – and ensure the needed replacement part is in stock when you roll in.

Autonomous and safe

Connectedness is also what makes autonomous vehicles possible. And while some people may distrust driverless cars, the data shows that they're safer than the self-driven sort – at least according to a report of the U.S. National Highway Traffic Safety Administration (NHTSA).

Self-learning

The accident in question happened when the semi-truck took a left-hand turn into oncoming traffic. The reason the Tesla did not detect such a large object in its path is because it could not distinguish the white color of the trailer from the bright, white Florida sky in the background.

6. INDUSTRIAL INTERNET

The Industrial Internet is the integration and linking of big data, analytical tools and wireless networks with physical and industrial equipment, or otherwise applying meta-level networking functions, to distributed systems.

Examples are pieces of machinery or vehicles that are equipped with intelligent technologies, including machine to machine (M2M) technologies that allow manufacturing equipment



INDUSTRIAL
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USES, APPLICATIONS AND BENEFITS

1. Digital/connected factory:

IIoT enabled machinery can transmit operational information to the partners like original equipment

manufacturers and to field engineers. This will enable operation managers and factory heads to remotely manage the factory units and take advantage of process automation and optimization. Along with this, a digitally connected unit will establish a better line of commands and help identify key result areas (KRAs) for managers.

2. Facility management:

The use of IoT sensors in manufacturing equipment enables condition-based maintenance alerts. There are many critical machine tools that are designed to function within certain temperature and vibration ranges. IoT Sensors can actively monitor machines and send an alert when the equipment deviates from its prescribed parameters. By ensuring the prescribed working environment for machinery, manufacturers can conserve energy, reduce costs, eliminate machine downtime and increase operational efficiency.

3. Production flow monitoring:

IoT in manufacturing can enable the monitoring of production lines starting from the refining process down to the packaging of final products. This complete monitoring of the process in (near) real-time provides scope to recommend adjustments in operations for better management of operational cost. Moreover, the close monitoring highlights lags in production thus eliminating wastes and unnecessary work in progress inventory.

4. Plant Safety and Security:

IoT combined big data analysis can improve the overall workers' safety and security in the plant. By monitoring the Key Performance Indicators (KPIs) of health and safety, like the number of injuries and illness rates, near-misses, short- and long-term absences, vehicle incidents and property damage or loss during daily operations. Thus, effective monitoring ensures better safety. Lagging indicators, if any, can be addressed thus ensuring proper redressal health, safety, and environment (HSE) issues.

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