SHANZEH BATOOL

19BAI10017

ASSIGNMENT 1

Q. *List out 20 use cases of the Internet of Things.*

Following are 20 use cases of IoT –

1. **Wellness Elderly Monitoring**: One of the goals of the system is to enable those living independently to continue doing so while still providing family and caregivers a peace of mind about their wellbeing. It uses a range of sensors placed throughout the home to track a person's routines wirelessly and discreetly. Open/close sensors are attached to doors and cabinets to gauge activity levels and medication usage. Presence sensors are placed beneath mattresses, chairs and even under toilet mats to monitor sleeping, sitting and bathroom use, and finally wall mounted motion sensors are used to track general activity levels throughout a day.
   The sensors are all connected through a base station and transmitted via cellular networks to the cloud to be analyzed and tracked. The system can be setup to notify family members (or professional caregivers) in real time if a possible issue is detected, and an online dashboard gives an analysis of sleep and activity patterns over time.

2. **Smart Helmet**: Crash Sensor pairs your bicycle helmet with your smartphone. If you crash and hit your head on pavement, a signal will be sent to the phone to automatically call for help. The sensor is mounted onto the helmet and is paired with your smartphone via Bluetooth. Once that sensor smacks with cement — or anything that's hard (ice, snow, dirt) it uses the devices motion and impact calculations to determine the severity of the crash and initiate the 30-second countdown. If the injury is not bad and you can walk it off, simply cancel that countdown on your phone. If you don't cancel it, your medical information and GPS coordinates will be sent to your designated emergency contact and you can expect help to be on the way.

3. **Track down those lost keys** - You can easily track down those lost keys or cell phone in your house using Bluetooth and other wireless technology devices.

4. **Heat your home efficiently** - Smart thermostats use remote sensors, real-time weather forecasts, and the actual activity in your home during the day to reduce your monthly

energy usage by up to 30%, keeping you more comfortable, and offering to save you money on your utility bills.

5. **Make sure the appliances are off** - Smart outlets allow you to instantly turn on and off any plugged-in device from across the world or just your living room. Save money and conserve energy over time by eliminating standby power, measure and record the power usage of any device, and increase its operating lifespan through more efficient use and scheduling.

6. **Light your home in new ways** - Web enabled lights like the Phillip's Hue can be used as an ambient data displays (Glow red when my bus is 5 minutes away). These multi-functional lights can also help you to reduce electricity use (automatically turn off the lights when no one is in a room) or help to secure your home while you are away by turning your lights on and off.

7. **Avoid Disasters** - Using a device like the ConnectSense and its range of add-on sensors you can track if a water pipe has burst in your basement, if there is motion inside your home while you are away, and have it automatically send you a notification by email or text message when it happens.

8. **Keep your lawn and plants alive -** Whether taking care of a small hydroponic system or a large backyard lawn, systems like GreenIQ with their suite of sensors and web connectivity help save you time and resources by keeping plants fed based on their actual growing needs and conditions while automating much of the labor processes.

9. **Keep streets clean** - Products like the cellular communication enabled Smart Belly trash use real-time data collection and alerts to let municipal services know when a bin needs to be emptied. This information can drastically reduce the number of pick-ups required, and translates into fuel and financial savings for communities service departments.

10. **Light streets more effectively** - This smart lighting system from Echelon allows a city to intelligently provide the right level of lighting needed by time of day, season, and weather conditions. Cities have shown a reduction in street lighting energy use by up to 30% using solutions like this.

11. **Maintain & repair** - Sensors installed inside equipment will monitor if any parts have exceeded their designed thresholds and will automatically send reports to owners and manufacturers if they have. Early predictions on equipment malfunctions can be made with parts and service maintenance can be automatically scheduled ahead of an actual part failure.

12. **Stop guessing** - Retailers can run real-world A/B tests using networked cameras and sensors like those in the Shopperception system to detect how customers are engaging with specific products and the store's layout.

13. **Monitor** - Smart Structures' SmartPile technology is an example in action that uses wireless sensors embedded within concrete foundation piles to ensure the quality and integrity of a structure. These sensors can provide load and event monitoring for the project's construction both during and after its completion.

14. **Keep track of your assets** - The OnFarm solution combines real-time sensor data from soil moisture levels, weather forecasts, and pesticide usage from farming sites into a consolidated web dashboard. Farmers can use this data with advanced imaging and mapping information to spot crop issues and remotely monitor all of the farms assets and resource usage levels.

15. **Safety first** - Enguage offers an electronic system that notifies authorities when a fire extinguisher is blocked, missing from its designated location or when its pressure falls below safe operating levels. Alerts can be sent directly through an instant email, phone call or pager notification to proper agencies and supervisors.

16. **Track Water** - The University of Berkeley's Floating Sensor Network project uses motorized drifters (Outfitted with cell communication, GPS, temperature, and salinity sensors) that can be quickly deployed in response to unanticipated events such as floods to track the movement of water, contaminants, and other conditions in waterways.

17. **Monitor pollution levels -** The Air Quality Egg is a community-led air quality sensing system designed to allow anyone to collect high resolution readings of NO2 and CO concentrations outside of their home using an RF transmitter and ethernet driven base station. The data can then be shared to create a network of readings to be used by the community and general public.

18. **Maintain quality & consistency** - Using networked sensors, cameras, and lasers to analyze manufacturing processes like those from SightMachine you can determine if a part is good or bad based on its physical characteristics; identify if it is the right component for the job and monitor trends, variations, and relationships in the system over time.

19. **Stop driving in circles** - With the use of installed sensors, mobile apps, and real-time web applications like those provided in Streetline's ParkSight service, cities can optimize revenue, parking space availability and enable citizens to reduce their environmental impact by helping them quickly find an open spot for their cars.

20. **Remember to take your meds -** GlowCaps fit prescription bottles and via a wireless chip provide services that help people stick with their prescription regimen; from reminder messages, all the way to refill and doctor coordination.