List out 20 use cases of the Internet of Things.

1. **Remote Monitoring:** With IoT-connected assets, you can monitor equipment usage and health in order to assess performance and deploy service should there be any problems.

2. **Supply Chain Management and Optimization:** With the Internet of Things, there are several major benefits that the supply chain will experience, summed up well by SupplyChain:
    - Real-time tracking of assets and products
    - Automating warehouse tasks
    - Paperwork management can be digitized
    - Forecasting accuracy improves dramatically
    - Operations have far greater control of inventory

3. **Digital Twins:** A virtual, or simulated real-world object, concept, or area within a digital space, digital twins are an interesting and powerful use case of IoT.

4. **Real-Time Machine Monitoring:** Real-time machine monitoring makes this possible, providing a stream of data straight from the machine control to provide accurate data analytics that can be used for in-the-moment decision making or in-depth analysis.

5. **Predictive Maintenance:** With IoT-connected equipment, manufacturers can move from a calendar-based plan to a condition-based strategy. If manufacturers collect enough data on equipment performance and health, they can closely monitor variables to establish a threshold that can predict impending machine failure.

6. **Production Visibility:** The only way for most manufacturers to know what is happening on the shop floor is to actually walk out onto the shop floor. Even then it may take some time to observe the operators and machines to truly understand where performance stands. They may have to engage with managers, analyze a whiteboard of part counts, etc.

7. **Integrating Systems:** The CMMS can use this data to automatically deploy maintenance upon a machine failure, jobs can be scheduled in the ERP based on more accurate cycle times provided by the machine data, and financial teams can use the production data to more accurately quote customers and ensure that the right amount of jobs are brought in for production.

8. **Compiling KPIs:** The goal is always to reduce the time and effort it takes to understand if performance is matching expectations. Luckily, IoT platforms are helping to compile and contextualize data into simplified reports and dashboards that can quickly explain how well a business is performing.

9. **Automation:** Industrial automation is one of the largest promises of Industry 4.0.

10. **Asset Utilization:** The Internet of Things allows manufacturers both large and small to monitor and optimize equipment with data analytics. Health and performance and machines can be tracked, downtimes can be categorized, and decisions can be made to better use the equipment.

11. **Autonomous and Connected Vehicles:** Down the road, vehicles will reach Level 5 autonomy and drive themselves entirely without human intervention. Carmakers and automotive startups are working on getting levels 3 and 4 self-driving technology right. Cameras, radar, light detection and ranging (LIDAR) and a host of other onboard sensors are being used to capture information about road conditions, inform appropriate driving actions, and prevent potential accidents.

12. **AR/VR:** AR layers information onto the real world. Whether ani-morphing faces in a video chat or hunting cute little creatures in one's backyard, your devices are using real-world information, then layering on digital information to change or augment reality. VR places users in a digital world, then use captured motions (eyes, head turns, etc.) to make them feel immersed in that world.

13. **Smart Watches, Fitness Trackers, Wearables and "Hearables":** The wearables market is thriving. This global adoption is due in large part to smartwatches, which are expected to make up over half of all wearables sold in the coming years. Consumers are looking for seamless connection

and interaction between their smartphones and smartwatches to track, manage, and secure their data — especially sensitive health data.

14. **Machine-to-Machine (M2M) Connected Devices:** Today's factories are using IoT-enabled machines to work smarter, not harder. By equipping machines with sensors, factory managers can more accurately map machine workloads, inputs, and outputs. They can also more closely track machine wear-and-tear, which leads to maintenance that is predictive rather than reactive and improves lifespan. With these features, factories are increasingly becoming automated, thanks to the wave of Industry 4.0. Machine- to-machine (M2M) devices typically use embedded and removable flash solutions to aggregate data into a single stream at the edge.

15. **Supply Chains of the Future:** Another IoT use case is in supply chains, which are increasingly global and complex. Customer requirements evolve rapidly, products have to be procured, and shipping and delivery routes must be coordinated. In response, companies are creating connected enterprise systems and using data modeling as a key part of a broader data management strategy. Low-power IoT devices are also being used to track assets throughout the supply chain, and monitor product quality such as temperature, vibration and to track shipping container openings. By using IoT-enabled devices on transportation routes, further improvements can be made to route planning by collecting in-transit, supply chain data.

16. **Drones on the Rise:** For cinematographers and photographers, drones have helped record stunning landscapes previously unavailable to visual artists. But these flying devices aren't just used for this purpose. Oil rig workers are using drones to complete full rig inspections quicker, without sacrificing worker safety or production downtime. E-commerce companies are beginning to use delivery robots and drones to deliver buyers' goods from pizza to packages to their front doorstep.

17. **Smart Cities:** One of the most promising IoT use cases is in creating smarter, more efficient cities. Public energy grids can be optimized to balance workloads, predict energy surges, and distribute energy more equitably to customers. The same goes for transportation systems in dense, urban environments. Traffic lights could be synced to adapt to traffic conditions in real-time.

18. **Healthcare:** IoT devices at the edge are changing patients' healthcare experience, whether it's a mobile device collecting patient information at an

emergency room visit or a diabetic's on-body continuous glucose monitoring system.

19. **Smart Agriculture:** Smart sensors can also be placed in irrigation systems to reduce water consumption, creating just the right moisture level in soil for a given crop. It's even being used to watch over factors such as humidity and temperature in composting.

20. **Companion Robots:** An IoT use case that has emerged in tandem with this year's pandemic is companion robots. For those who have been shut in at home during the shelter-in-place, companion robots have become a welcome friend. They have names, some can converse, and one day may even be able to take vitals and administer medicine to elders living alone.