Assets for development of IoT solutions, Business requirements for use case

Asset Tracking

- Asset tracking is the process of tracking a physical asset (can be human or equipment) within a manufacturing facility to identify their location accurately and utilize them to the fullest.

- Asset tracking (as opposed to inventory tracking) focuses on a company's **reusable resources**, such as machinery, vehicles, reusable containers, and other tools—any asset on the move that the company doesn't want to get lost.

- Asset Tracking systems help to **manage equipment** (generally high-value assets such as generators, tools or OHVs) using GPS asset tracking devices, barcodes or RFID tags. It is used to improve security and utilization of a company's physical assets.

Selection of asset tracking technology

- **Asset tracking technology depends on these parameters:**
  - Desired accuracy or granularity of location data.
  - Number and value of assets being tracked.
  - Cost or risk associated with asset loss.
  - Physical environment that has to be tracked.
  - Global/ location area to be tracked
  - Cost to purchase and maintain an assert tracking system

Smart technologies behind assert tracking

- **Barcodes:** Providing unique identification—while not necessarily giving timing or location data.
- With the simple code-and-scan configuration, barcodes have found essentially global traction in retail, manufacturing, warehousing, logistics, public transportation, and just about every other industry.

- biggest advantages to barcodes is the physical nature of the identifier itself. Barcodes don't require power and can be extremely small.
- **Advantages:**
- Inexpensive. Extremely small and lightweight.
- Can be used for massive numbers of assets with no limit on quantity.
- **Disadvantages:**
- Manual scanning, short range, expensive software component required for inventory management.

Smart technologies behind assert tracking

- Tracking with RFID: RFID systems work primarily through a combination of electromagnetic readers and tags. Tags contain identification data to be read by both stationary and hand-held RFID readers. Readers, or interrogators as they're often called, detect which tags are present.

- stationary and handheld scanners can be used for inventory processes, security checks, or other tasks.

- low frequency, high frequency, or ultra-high frequency RFID.

- Passive RFID tags use the power emitted by the reader to relay a signal back, eliminating the need for internal batteries.

- Active RFID systems connect a power source to each tag.

Smart technologies behind assert tracking

- **Asset Tracking with Ultra-wideband (UWB):** outperforms other location and tracking technologies in accuracy, scalability, security and cost. top-performing technology for location-based processes.

- Technique for transmitting data over a large section of the radio spectrum. This works by emitting short pulses with a small power output across a significant bandwidth.

- low-power way to send a considerable amount of data.

- ability to penetrate obstacles gives it installation flexibility, including operability without a line-of-sight between devices.
- Advantage: No interference, top location accuracy.
- Disadvantage: time-syncing for location and tracking

Smart technologies behind assert tracking

- Bluetooth / BLE for Asset Tracking: used for indoor positioning applications. establish their own wireless networks.

- ability to use consumer mobile devices as roaming hubs makes BLE a particularly common technology for location and tracking applications.

- Indoor environments such as shopping malls and hospitals also use BLE widely to gather location data.
- **Advantages:** Low power consumption
- Accurate up to a few meters
- Real-time updates
- **Disadvantages:** Risk of interference from devices in shared frequency spectrum
- Security vulnerabilities

Smart technologies behind assert tracking

- **LPWAN Technologies for Location and Tracking**: more recognizable technologies in LPWAN asset tracking are LoRa (long range) technology, Narrow Band IoT (NB-IoT).

- combination of lower power consumption and higher signaling range is particularly advantageous for LPWAN solutions.

- strong potential for scalability. more affordable to deploy and operate.
- PWAN technologies use existing and widely available infrastructure like cellular networks, enabling lower infrastructure costs.

- **Advantages:** Long signalling range, Scalability, Low power consumption
- **Disadvantages:** High latency, Lower data rates

IoT asset tracking system-Key features

- To lead the IoT asset tracking market, you need to guarantee that your devices will consistently provide customers with the data they need.
- **The four key features the best tracking system should have**:
- Always-on connectivity: Data providing useful insights on asset locations, temperature, functionality or any other metric your devices track must be sent reliably and continuously.
- Long-lasting, future-proof connectivity: connectivity needs to be adapted to be power-efficient and last for the long run.
- Data and analytics: Industry requires precise, reliable, and real-time data that can be used to make informed decisions.
- Comprehensive security: data coming from those devices is transmitted safely and securely.

Use Cases for IoT-enabled Asset Management

- Based on the gathered data, IoT-enabled asset management solutions can provide companies with real-time alerts, predictive analytics, automatic reporting, data insights.
- Use Cases: **Locations:** Automatic location data, asset tracing and geofencing solutions (e.g. utilizing GPS trackers).
- **Usage hours:** Automatic tracking of usage hours and notifications about reached threshold values (e.g. acceleration sensors).
- **Warehouse inventory:** Automatic warehouse inventories without any separate inventory events (e.g. BLE beacons).
- **Material flows:** Automatic tracking and reporting of material flows (e.g. RFID tags).

IoT based asset trackers

- Samsara: allowing customers to track in real time or through periodic check-ins. The Samsara AG24 is designed to track powered assets in real time, while the more affordable AG46 unpowered asset tracker provides a low-power option with customizable GPS check-ins.

- Omnitracs: Targeted to vehicle fleet tracking. offers a full suite of services including fleet telematics, driver and vehicle performance monitoring, and trailer tracking. The tracking services provide asset location—including predictive maintenance, diagnostic information, and fuel data even for remote assets.

- AT&T Fleet Complete: captures GPS information along with other data such as humidity and temperature readings, light exposure and impact status. The solution utilizes solar power for recharging and is suited for monitoring assets in many industries, including medical supplies, construction materials, and machinery.

IoT based asset trackers

- Azuga: specialist in fleet tracking. provides sensors to track physical assets such as small equipment and shipping containers. Azuga also offers geofencing, a feature that lets you draw an invisible line around your assets and receive an alert whenever a tagged item leaves the designated area.

- EROAD: offers comprehensive fleet management. Their tracker uses 4G connectivity and feeds all collected data to a single dashboard, allowing users to manage shipping fleets while keeping track of regulatory compliance.

- Particle: enables real-time asset location monitoring along with additional data capture, such as temperature and acceleration sensors. The system's open firmware enables users to add additional IoT sensors and manage everything together on the Particle IoT Platform

Business requirements for use case development

Ten steps to a successful business case for IoT

1. Recognise the need for a business case
2. Start on the shop floor
3. Identify meaningful data
4. Employ predictive analytics
5. Track your products and assets
6. Create new revenue models
7. Move from drawing board to reality
8. Choose the right IoT platforms and partners
9. Build a proof of concept
10. Rollout at scale

Business requirements for use case development

- Description of the workflow of the business use case:
- This process starts with an initial contact between the Customer and The Company. This may happen in one of the following ways:
- The Customer contacts The Company with an inquiry or a set of requirements.
- The Company decides that it has products that would add value to the Customer and revenue to The Company.
- **There are two main purposes of this section:**
- Gather customer requirements,
- Decide about further actions on this opportunity.

Business requirements for use case development- Customer Requirements

- Discussion with Customer
- Analyze customer input.
- Performing a preliminary site survey
- Available customer information
- Choice of technology
- Product preferences

Business requirements for use case development -functional requirements

- Mobility/capacity
- Network growth projection
- Installed base information
- Deadlines
- Service requirements
- Price requirements