



Asset & Location Tracking Solution

Indoor Position Tracking – Objectives

- For each job either in movement or at rest inside the factory should be tracked and located on a live basis.
- Should be able to locate a Component with its unique Part Number.
- The location data of every item should be stored for future analysis / movement optimizations.
- The system should be able to identify items which are idle for long time periods, (say for more than 30 days).
- The solution should be integrated with their existing ERP systems
- The system should be able to generate pre-defined reports.
- The system should support different user profiles with specific access and view privileges
- Should support a local HMI with Digital twin of the factory for quick monitoring

Gadgeon's Solution Approach

Gadgeon is proposing a location tracking solution based on BLE technology

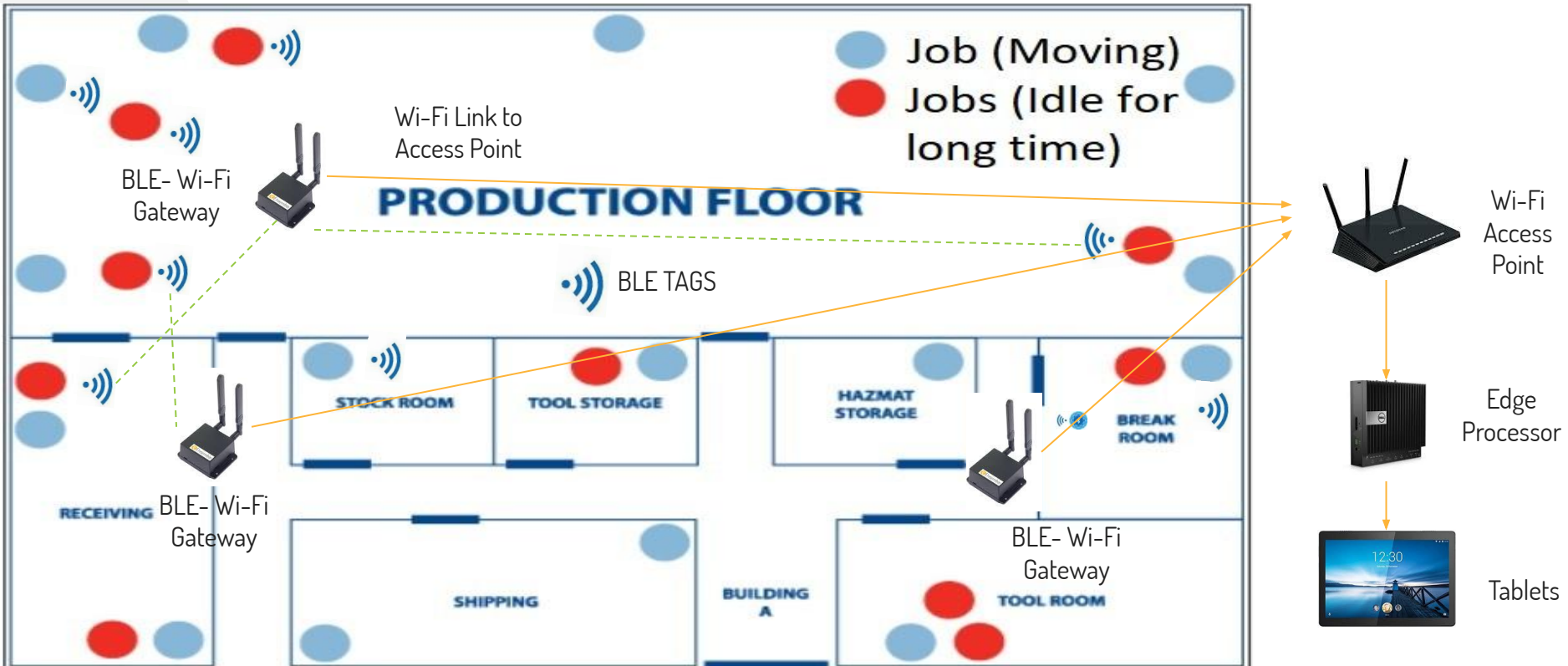
- BLE Tags that transmits Beacons placed on objects to track
- BLE-Wi-Fi Gateway (Reader) connects to Wi-Fi intranet
- 1-3 meter precision is obtainable
- Gateway to be deployed at a range of 10-15 meters
- Triangulation algorithm running in Edge server calculates location of object every 15mins (configurable)
- Tag can be reused and the battery lasts up to 2 years

Key Features

- Real-time tracking and intelligence within the premises
- Can enables features such as Alarms and Alert notifications
- High precision location tracking



System Diagram for the proposed BLE based Solution



Solution Budget and Constraints

Serial No	Item Description	Cost	Remarks
1	BLE tags	Rupees 800	
2	BLE Wi-Fi Gateway	Rupees 4500	Need a Gateway at every 10-15 meter
3	Edge Processor and Tablet		If exists with KSB Mills, we could use for this Solution

- **Constraints for Deployment**
 - For optimum results, we should minimize metal areas between the BLE tag and the Gateway
 - Special mechanical assembly could be considered to place the Tags on the objects (The Tag stays on top, easy to remove as well not damaging to Object's surface)

Technology Options that are used for Location tracking

- **Wi- Fi based Solutions**
 - WiFi Tags 3-4 times costly compared to BLE
 - Precision is around 10-15 meters
- **UWB based Solutions**
 - Precision is < 50 cm which is NOT needed for the Objectives we are trying to achieve
 - Cost is 3 times compared to BLE
 - UWB receivers needs to be placed closer compared to BLE
 - Have better performance in metallic environments
- **RFID**
 - Tag cost is very low compared to BLE in case of passive RFID
 - However for RFID tag reading, lot of manual intervention are needed

Comparison of Different Asset Tracking Technologies

	QR CODE	BARCODE	RFID		NFC	BLE	GPS
			Active	Passive			
Cost Effective	✓	✓	✗	✓	✗	✗	✗
Real-time Tracking	✗	✗	✗	✗	✗	✓	✓
Power Consumption	✗	✗	✓	✗	✓	✗	✓
Range of Scanning	High	Low	High	Low	Low	Low	Unlimited
Storage Capacity	3 Kilo Bytes	> 100 Bytes	2 Kilo Bytes	4-8 Kilo Bytes	48 Bytes – 8 Kilo Bytes	NA	Unlimited*
Continuous Scanning	✓	✓	✓	✓	✓	At Regular Intervals	Real-time Data
Two-way Communication	✗	✗	✗	✗	✓	✓	✓
Chances of Human Error	—	—	—	—	—	—	—
Labor Intensive	✓	✓	✓	✗	✓	✓	✓
Popularity	V. High	V. High	High	High	Moderate	Moderate	Moderate

*Unlimited because GPS provides real-time data and save as such none of it. But if recorded, it can save up to 1 Peta Byte data or even more.

Source: **asset^{co}**



THANKS!

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