

# WHITE PAPER

## Optimisation of production processes



## CONTENTS

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- **1. Introduction**

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- **2. What problems are industrials facing?**

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- **3. Which IoT technologies are most appropriate.**

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- **4. Many possible applications**
  - **Use Case 1: Tracking tools/containers during the production process**
  - **Use Case 2: Management of intra-production trailers**

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- **5. Conclusion**

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## INTRODUCTION

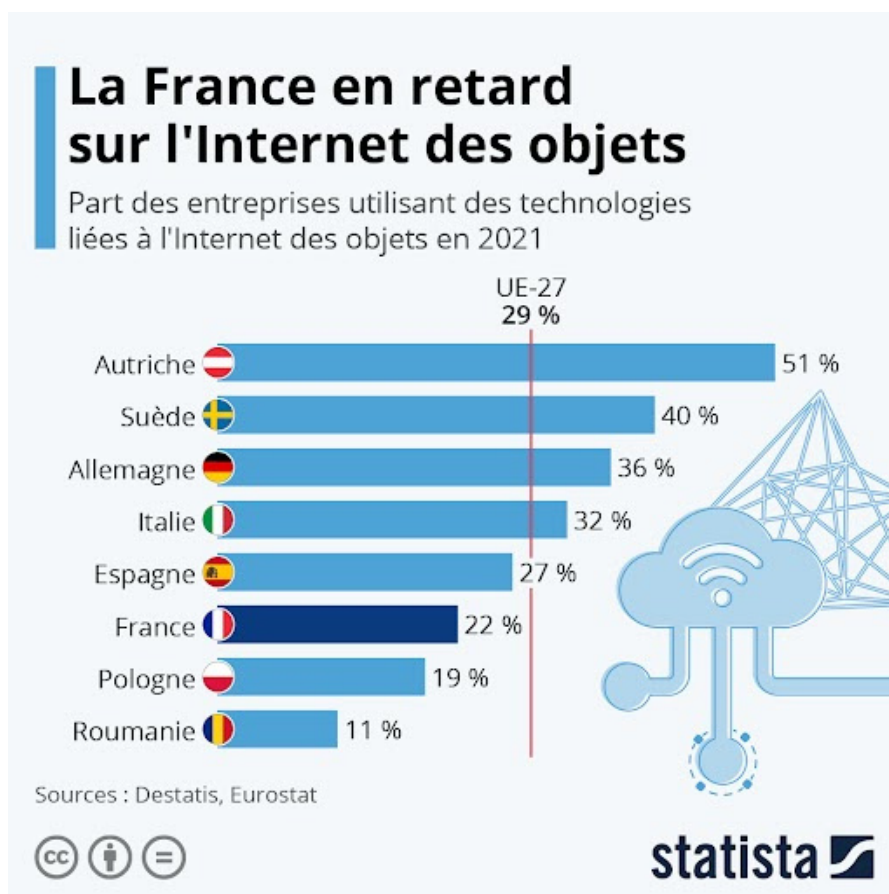
Companies producing goods and services are increasingly forced to work under pressure: with the return of inflation in industrialised countries, pressure on wages, lack of skilled labour, increased internationalisation, longer transport times, shortage of electronic components and disruption of growth cycles, it is becoming imperative to **optimise production processes to remain competitive**.

**Optimising a new plant is less complicated than optimising an existing plant** with very specific processes, a wide range of machines of different generations and heterogeneous information systems.

The **future of industry lies in automation**. From order preparation to the supplier, to the dispatch of the finished product, each stage of production requires constant monitoring in order to optimise flows and delivery times thanks to **technological solutions (IoT) that enable the optimisation and development of the business** and thus boost turnover.

Nowadays, it is still **unusual to find companies that have developed an IoT project** within their production chain. It is therefore vital for them to implement these solutions in order to **embrace the 4.0 era**.

“With 22% of companies using connected objects in 2021, France is below the EU average (29%). The best equipped companies in Europe are in Austria (51%), while countries like Sweden (40%) and Germany (36%) are also among the most advanced.”



<https://fr.statista.com/infographie/26708/internet-des-objets-part-des-entreprises-utilisant-objets-connectes-france-europe/>

> This diagram shows that some countries, such as France, are clearly behind other European countries in the use of IoT technologies.

Our mission, at UBI Solutions since 2008, is to help manufacturers to optimise their processes in order to face all these new challenges.

## What problems are industrials facing?

The industrialists we meet today present us with **numerous problems**. Whether it is in terms of stock optimisation, resource management, quality improvement, monitoring of materials and tools, etc., each of them has similar needs which generally translate into **a desire to increase productivity and efficiency** in order to cope with the explosion of the goods and services market and increasingly fierce competition.

To achieve this result, it is necessary, indeed essential, to **equip oneself with new IoT technologies** that are constantly **revolutionising the industrial sector** by **simplifying its processes**. Indeed, as we explained earlier, the benefits of IoT are countless, especially in the industrial sector.

**They are characterised by financial gains, but also gains in time, quality of work and comfort for employees.**

To remain competitive and efficient, manufacturers **must ensure production quality and operational efficiency throughout the chain**. Thanks to the information required via IoT solutions, they are now able to **predict and anticipate possible problems encountered during the production process**, such as machine breakdowns, last-minute parts orders, stock shortages or even material losses.

Without IoT processes and therefore without this information, the management of industrial equipment is often done intuitively or with very low value-added manual actions that are often a **source of "human" errors**.

Indeed, one of the **current problems of the actors of the industry lies in the production process**, the supplier orders and the human interventions. Whether it is with "manual" or paper-based solutions, errors are numerous. This is not a problem if the process is homogeneous and can be planned in the long term.

However, when the process is more complex and requires rigour, things become more complicated (lack of electronic components, disruption of supply chains, emergencies etc.).

**Without any visibility, they can only rely on their instincts**, which is not a 100% reliable solution. This is an unnecessary waste of time when you consider that companies that adopt IoT **can automate these recurring tasks, optimise the use of their equipment and therefore focus primarily on analysis and rational decision making**.

As you can see, the IoT is **making a lot of progress in this area** and is helping more and more manufacturers to solve their many problems.

## Which IoT technologies are most appropriate.

The IoT (Internet of Things) is a network of interconnected smart devices. Such a network **allows users to monitor in real time and manage any asset remotely**, while reporting on its usage and other configurable KPIs.

Today's technology reduces the amount of time spent per employee during the production process, thus **reducing the charge of tool management, production planning and preparation per day.**

IoT solutions make processes **more efficient and secure for employees** in the production and logistics chain.

The processing of data is a **central element in good functioning of the company**, especially with the integration of IoT solutions in order to assimilate and process the information in the production process.

When it comes to indoor and outdoor tracking and geolocation needs for industry, there are many solutions. The most well known are tracking **using RFID and BLE/LoRa technologies**. This is what we deploy with our customers.

These systems are recognised as **effective tools in the logistics and industrial sphere**. They both have advantages and limitations. **We will propose the most suitable technology depending on customer's needs.**

## Radio Frequency Identification (RFID) technology

RFID is a technology that can **automate many processes or steps in the production chain**. It allows us to identify and transmit information about an object using radio frequency waves. To do this, we need an RFID tag, which allows us to store, transmit or identify this data.

To read this tag and the data it contains, **a reader and RFID antenna are required**, which will identify the tag remotely and then point to the data stored in the system database. Depending on the size of the warehouse, the site and their configuration, it may also be necessary to install other readers such as **arches or RFID portals**.

RFID technology is one of the solutions that enables the **highest level of industrial automation**. It is very important in certain processes in the production chain and, in particular, helps to **avoid errors and reduce human intervention in highly repetitive tasks**.



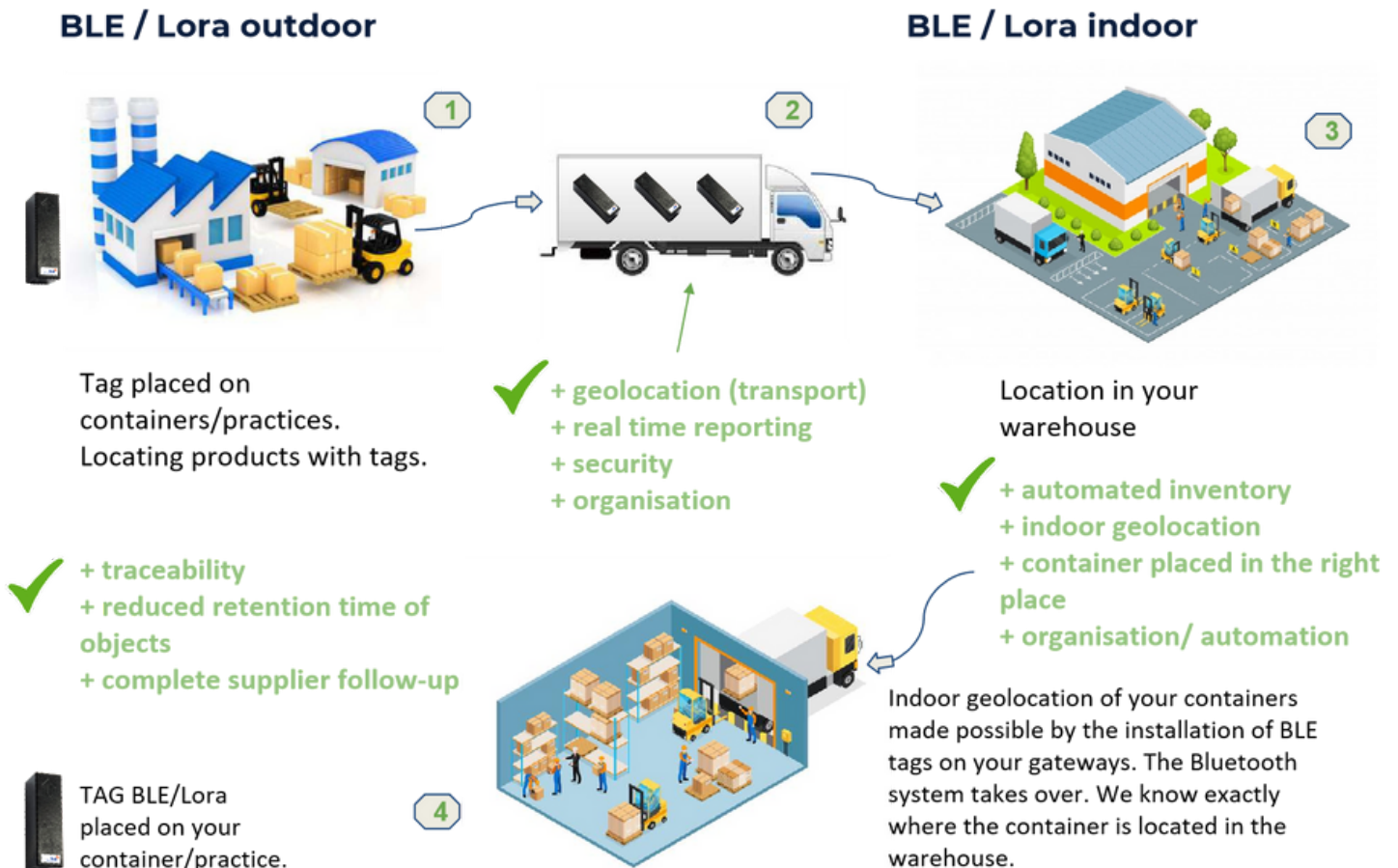
## The technology BLE (Bluetooth Low Energy)

BLE is a technology approved by manufacturers who **want to implement a RTLS** (Real Time Location System) to manage their production process reliably, efficiently and without human error.

It is a technology that is **well suited to the specific requirements of industrial environments**. Frequency of location updates, long battery life, location accuracy and other asset control parameters are key factors to consider.

It has earned its reputation with manufacturers **because of its ability to send location data quickly and accurately**, giving them **full visibility of all their assets in real time**.

Its batch operation makes BLE technology **less energy intensive**, allowing the beacons/tags installed on assets and the wireless sensors/Gateways installed in the warehouse to operate for several years. In addition, it is a technology that offers a **greater range of up to several hundred metres**, making it **perfect for both indoor and outdoor use**.





The sensors are located in the areas to be monitored **in order to identify the location of assets in an area, department or even a room**. They transmit BLE signals in certain frequencies and interact with **BLE beacons**, each of which has a **unique identification**, which at the same time are associated with a specific asset. In general, a Gateway has a **coverage area of 80 metres**.

The BLE beacon we have deployed, also known as the **Universal Industrial Tracker** is a small box that has built-in sensors combining **GPS, Wi-Fi, BLE and LoRa geolocation technologies**. With a compact and robust design, it is **built to withstand harsh environments**, has a very long standby time and an IP68 enclosure making it **perfect for accurate indoor and outdoor geolocation**.



With the use of this technology and through an **IoT platform**, companies can use real-time location data to **optimise their production process and gain efficiency**. As the need for IoT solutions continues to grow, **BLE has become one of the leading wireless technologies to power an RTLS system** due to its many benefits.

## Many possible applications

There are many possible applications where BLE technology is used to **provide optimal asset tracking and management to automate and improve production processes**. Here are some examples of where **UBI Solutions has deployed and delivered an effective solution** to support its customers in achieving success.

### Use Case 1: Tracking tools/containers during the production process

In order to optimise production processes and to **have visibility on all the logistic means on the whole chain** (supplier, carrier...), industrialists are setting up traceability solutions to track their assets and more particularly their tools and containers necessary for the realisation of their production projects.

For this type of project, it is **the BLE technology that is recommended**.

One of the problems that often comes from manufacturers is being **able to receive their tools and containers on their production site in time** to meet the production schedule. It is very important for project managers to **have a vision of a concrete schedule** with the real stage of production in order to be able to foresee and anticipate the actions to be taken.

The objectives to be achieved on this type of project can be multiple, such as

- **To obtain the precise status of assets at different stages of the chain:** to track deliveries on site, to track and easily find returnable assets, to identify their usage and their status. In other words, to have an instantaneous indication of whether the equipment are in advance, late or up to date.
- **Launch alerts according to the progress of deliveries indicated on the production schedule:** possibility of programming different levels of alerts according to the status and location of the asset.
- **Having visual management and reporting dashboards:** provision of a tool to access the information gathered and thus make informed decisions.

These objectives are made possible **thanks to the implementation of a solution that allows tools to be traced and their position in the logistics loop** to be known. As a rule, each tool has a specific shape and corresponds to a precise need, so it is **essential to assign it a unique identifier**. This is **made possible by installing BLE Trackers/Tags and a QR Code** on each object (tools or containers). The tracker number is equal to the QR code number, both giving a unique number.

The QR Code is simply installed so that it can be read with a mobile terminal.

At UBI Solutions, we have deployed a **highly versatile multi-mode tracker** (Universal Industrial Tracker) that has **integrated sensors combining GPS, low power GPS, Wi-Fi, BLE and LoRa geolocation technologies**, enabling accurate indoor and outdoor geolocation. With a compact and robust housing, it is **designed to withstand harsh environments**, has a very long standby time and an IP68 rating making it perfect for asset tracking.

We have implemented this solution in two companies in the industrial sector. The objective for the latter was to **automate the preparation and follow-up of orders in view of manufacturing lead times ranging from several months to several years**.

BLE technology coupled with Lora and GPS has enabled the automation of the production line by implementing a tag directly on the truck to track tools or raw materials. **BLE trackers/tags provide positional accuracy.**

Thanks to the accelerometer we can know in real time the slightest movement of the tracker associated with the containers or contents in this case the tools. This provides security, **especially for high-value products**, or to check whether the tools or containers have arrived at their destination. This is in line with the fact that the production of what goes out and comes in on the site can be monitored.

The location data is then transmitted by the LoRa / 4G LTE terminals to the **UBI Cloud web platform to produce a dashboard, reports and alerts in real time.**

UBI Cloud is a web-based **Track & Trace solution in SaaS mode** or hosted at the customer's site that allows for the management of all flows. It has been adapted for asset management and can be easily configured, it is possible to have local views for the operators of each site and global views for the actors hierarchically responsible for the management of several or all sites.

Here is an example of a dashboard for monitoring production processes:





The traceability of assets in real time can be analysed through tailor-made maps:



It is also possible to obtain real-time traceability in the outdoors thanks to wifi sniffing and LORA feedback.

The advantage of a bi-technology solution **is the versatility of detection**. For example, the industrial companies for which we have implemented the solution have both indoor and outdoor storage. **If the BLE signal is not working at the time, the GPS solution takes over to identify the movement**. The tracker positions itself either by GPS signal or by BLE Anchor (BLE as a priority, otherwise GPS) and the tracker sends back the position information at regular intervals via the LoRA network.

## Use Case 2: Management of intra-production trailers

One of the recurring needs in the industrial sector concerns **the management and tracking of intra-production trailer-type loading vehicles between several entities.**

The objective of this solution is to **automate the end-of-production process**. Indeed, industrialists encounter many difficulties when shipping finished products. The operator goes to the wrong dock, spends too much time loading or is not in the right place, etc.

It is therefore necessary to be **able to monitor arrivals and departures at each loading and unloading dock and the time spent on each operation**. Indeed, dock processes are a crucial step in the supply chain. The performance of production processes depends, among other things, on the **optimisation of dock management**.

Delays, material losses, poor loading management can have a real impact on the success of the business.

The implementation of an IoT solution can ensure the fluency running of all supply chain processes. It provides full visibility of dock arrivals and departures at all times, **allowing for optimal planning of multiple operations**. It is also possible to **determine the time spent on each dock and the duration of the operations of each employee**.

This system makes the delivery and goods management process more **fluid, simple and efficient**.

To implement this type of solution, we **placed trackers on each truck trailer**, so that we could follow them in real time and know when they arrived at the dock in order to recover the goods. Then we put BLE anchors on each dock to be able to detect if the right truck trailer is on the right dock and calculate the time spent per trailer on each dock.

## CONCLUSION

Before the implementation of this type of solution, **manufacturers were working with data and information provided by their suppliers and/or other third party companies**. Previously, the operators had to deal with the orders and the follow-up of the goods by paper follow-up. Everything was done manually and without any real follow-up. **Now they can both track and forecast**. They **can predict delays and avoid many mistakes**. All processes are automated and much simpler.

**Deliveries can be made on time, no delays, no lead times for optimal stock management or operations**.

With the implementation of such solutions, they can now have **access to information and therefore make informed decisions**.

This white paper aims to **provide information on the possibilities offered by BLE/LORA/GPS solutions** which free resources from non-value added tasks, optimise flows and production processes.

Implementing a tool management, production optimisation and intra-site management solution such as the one offered by UBI Solutions, helps to **track and control the status and movement of assets with ease and accuracy**. By optimising asset management, it is possible to **achieve significant savings, streamline and automate tasks and improve the performance of your operations**.

UBI Solutions' solutions are fully scalable and can help improve processes and operations in any industry. Many applications are possible, so we invite you to contact us to discuss your traceability projects in more detail.

## UBI SOLUTIONS

Since 2008, UBI Solutions has been providing asset tracking and traceability solutions to **over 600 customers in 30 countries**. Our solution is cloud-based, designed to work regardless of the type of technology required.

UBI Solutions **collects, analyses and processes the records of more than one billion transactions each year** using the best technologies such as RFID / BLE / GPS. Each solution is tailored to the needs and requirements of our customers to provide **fully customised solutions**.

# SMART IOT FOR GREAT BUSINESS



## UBI Solutions Paris (Siège)

Immeuble LE KUBIK  
9, allée des Barbanniers  
92230 Gennevilliers  
Tel : +33 9 81 70 04 81  
[contact@ubisolutions.net](mailto:contact@ubisolutions.net)

[ubisolutions.net/en](https://ubisolutions.net/en)