

IoT in Manufacturing 2023:



Why embracing location-based services is imperative for survival



Foreword



By **Steven Manifold**,
Chief Marketing Officer, Ubisense

Manufacturing has always been reliant on the best technology to fully optimise operations. In recent years, there has been a significant shift in attitude towards the Internet of Things (IoT) in the industry. From previously being seen as an interesting science project, it is now a necessity in modern manufacturing. While AI is in the rear view mirror, IoT is very much what lies immediately ahead. As such, adoption of the technology is on the rise.

To find out more about how and why manufacturers are implementing IoT into their assembly processes, Ubisense commissioned a survey of organisations in the aerospace, automotive and defence industries. This is third time we have conducted this survey, as we were keen to find out if attitudes towards technology have changed over the last two years.

This year's research revealed that manufacturers are using IoT more than ever before, with nearly two thirds (**62%**) of the organisations surveyed adopting it in their assembly processes.

This has risen from **44%** when we asked the same question in 2021. However, manufacturers worldwide are being impacted by the ongoing economic crisis, and this is not only affecting their assembly processes but their plans for future investments.

A variety of factors, including the spiralling cost of energy and supply chain disruption, mean organisations are constantly weighing up the pros and cons of investing in new IoT technologies while simultaneously trying to stay profitable. What's more, these economic pressures are compounded by operational challenges that highlight the need to adopt IoT. From struggling to achieve full visibility of their operations to failing to locate equipment and track human tasks, manufacturers still lack a comprehensive understanding of their assembly processes. This is impacting the day-to-day running of their organisations; leaving a gulf between what is possible with technology and what is actually being accomplished on the factory floor. Implementing IoT solutions can help them not only manage, but also improve, the efficiency of their operations.

Yet, despite their financial concerns, manufacturers are acutely aware of the importance IoT, and in particular real-time location systems (RTLS), will have on their industries, both now and in the future. The research suggests that manufacturers understand that embracing IoT will help ease the impact of their most pressing economic challenges. The tough global economic climate, along with operational struggles, is giving them even more reasons to invest in specific IoT solutions, such as RTLS. Significantly, the majority of manufacturers believe that organisations which fail to adopt such technologies will be left behind by their competitors and there is a consensus that RTLS will be ubiquitous in the industry by 2028.

This whitepaper explores the research findings, examines the financial and operational challenges that manufacturers are trying to overcome and discusses why they must embrace RTLS now or face a bleak struggle to operate efficiently going forward.



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4	On behalf of Ubisense, international market researchers Arlington Research conducted an online survey in the UK, France, Germany, the USA and Japan, among a total base of 330 respondents, all working as middle managers or senior managers, owners or partners, in organisations with more than 1,000 employees.
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9	Respondents worked in IT, business transformation, operations, logistics and quality connected to the manufacturing or assembly process within the aerospace, automotive and defence industries.

Key findings

More than **three-in-five** manufacturers (**62%**) are now using IoT in their manufacturing or assembly processes and just over **two-in-five** (**43%**) currently use real-time location systems (RTLS).

70% of manufacturers expect RTLS to be ubiquitous by 2028 and the same amount (**70%**) believe that manufacturers that fail to adopt the technology will be left behind in the years to come.

Three quarters of organisations (**76%**) are more likely to invest in IoT because of the current economic climate.



Businesses cite inflation (**19%**), the ongoing energy crisis (**16%**) and supply chain disruption (**16%**) as **the top three** concerns that could impact the manufacturing or assembly process in their organisations in 2023.



More than **a third** of manufacturers admit they frequently can't measure the efficiency of operations (**36%**); frequently can't find things, such as tools, equipment, parts, and materials (**36%**); and acknowledge that things frequently happen in the wrong sequence or take longer than planned (**35%**).

On average, more than **a third** of manufacturers (**36%**) waste at least one person-hour per day searching for tools or equipment.

A third of manufacturers (**33%**) say things (tools, equipment, parts and materials) aren't used correctly.



Less than **three-in-five** manufacturers have real-time visibility of production machinery (**59%**), parts or materials (**59%**) and products or work in progress (**58%**).

More than **half** of manufacturers believe that complexity of management (**54%**) and setup (**52%**) is a barrier to adopting location-based systems.

Tackling the ongoing economic crisis

It is no secret that manufacturers want greater efficiency in the manufacturing and assembly process. There has always been a desire to achieve shorter cycle times and increase quality, while also eliminating errors and reducing costs, through optimised processes and technology. It is also no secret that organisations across the world, including manufacturers, have had to deal with a difficult economic landscape over recent years. Following the COVID-19 pandemic, operations have returned to some semblance of normality, but manufacturers are still recovering financially from the impact of lockdowns and social distancing. Many have also been hampered by the recent rise in costs.



Our research found that inflation (**19%**), the ongoing energy crisis (**16%**) and supply chain disruption (**16%**) are the three top concerns impacting assembly processes and causing financial headaches for manufacturers. Inflation is a particular worry, with manufacturers in France, Germany and Japan all listing it as their top concern. A similar story can be said for the industries we surveyed, with defence (**24%**) and automotive (**17%**) organisations raising inflation as their top concern. The prospect of rising costs is leaving many organisations uncertain about when it will be right to further invest in ways to improve their operations, including IoT solutions. Do they take the leap now, or focus on their necessities in the hope that prices will fall in the future but run the risk that failure to invest will leave them exposed to their competitors?

"We continue to see organisations stuck in this catch-22 situation. If they do not have the necessary visibility of their operations to identify areas of waste and inefficiency, they are therefore not able to clearly articulate the benefits of investing in the very technology that would solve those issues."

Steven Manifold,
Chief Marketing Officer, Ubisense

Making the decisions that will improve efficiencies during a backdrop of economic turmoil is difficult to say the least. However, more than a third of manufacturers (**36%**) say they frequently can't measure efficiency of operations. This suggests that their current inefficiencies are causing losses, regardless of financial factors. The current economic circumstances and pressures mean it has never been more essential to invest in technology to improve operations and reduce waste.

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of manufacturers are more likely to invest in IoT because of current economic difficulties

Savings and efficiencies have become paramount, with more than three-quarters (**76%**) of manufacturers telling us that they are more likely to invest in IoT because of the current economic situation. With this willingness to invest in mind, it is important for manufacturers to consider the operational challenges that could be exacerbating their financial headaches.

Overcoming poor operational visibility

As manufacturers struggle with managing rising costs and disruption to the supply chain, they are also financially suffering because they lack real-time visibility of their operations. This is exacerbating the challenges caused by the ongoing tough economic climate. Financial and operational pain is being caused by what manufacturers are failing to see as they cannot resolve gaps in the assembly process. Transparency is essential to understanding all problems that may occur in the assembly process. Visible problems are challenging enough, but it is impossible for manufacturers to resolve issues they cannot see. While some progress has been made since our previous survey in 2021, the latest research suggests that manufacturers have a long way to go to achieve full visibility.

4 in 10 manufacturers do not have real-time visibility of production machinery

Around three-in-five manufacturers have real-time visibility of production machinery (**59%**), parts or materials (**59%**), and products or work in progress (**58%**). This means the remaining **40%** are struggling to see the complete picture. In France, less than half (**46%**) of the manufacturers we surveyed said they had real-time visibility of production machinery. Without the best IoT solutions in place, manufacturers are not able to recognise what resources are being wasted and how processes could be improved.

"It is the hidden nature of much of the process inefficiencies that exist in operations that makes IoT and RTLS technology so valuable. The data gap that exists between what is planned and what actually happens is especially large where processes are largely manual, human, or complex."

Steven Manifold,
Chief Marketing Officer, Ubisense

Furthermore, the visibility of human tasks in the manufacturing process is even more limited. In fact, overall only **42%** of manufacturers say they have real-time visibility of one of their organisation's most valuable assets – their employees. This is particularly problematic in the USA (**39%**), Germany (**39%**), and Japan (**37%**). Amongst aerospace organisations, the figure drops to **35%**.

36% of manufacturers frequently can't find tools, equipment, parts and materials

Along with this inability to monitor their human resource, manufacturers are also struggling to track vital factory floor supplies. More than a third (**36%**) revealed that they frequently cannot find important things, like tools, equipment, parts and materials. A similar amount also said it was common for processes to happen in the wrong sequence or take longer than planned (**35%**). Such difficulties lead to wasted materials and time, as well as a potential loss in revenue. On average, more than a third (**36%**) of manufacturers also waste at least one person-hour per day searching for tools or equipment.

It is time to embrace IoT

The challenges we have highlighted will not necessarily be fixed overnight and there is not a one-size-fits-all solution. Nevertheless, real-time location systems (RTLS) will help organisations overcome some of their operational difficulties and give them greater visibility of their production. Our latest survey shows that four-in-10 (**43%**) manufacturers are already using RTLS to aid the assembly process, but there is a difference between current adoption and expected implementation. While a fifth (**20%**) of manufacturers say they do not plan on introducing RTLS into their organisation in the future, the reasons for this vary and could be down to perceived costs and complexity. There is a link to the challenges we have touched upon, including the ongoing tough economic climate, as nearly half (**49%**) of manufacturers told us that the cost of RTLS was a major barrier to adoption.

One of the key stumbling blocks in IoT and RTLS adoption is education and understanding around how such technology works. While more than half of manufacturers said that the perceived complexity in managing location-based services (**54%**) and potential complexity in the setup process (**52%**) were barriers to the adoption of RTLS, this was mentioned more by those without plans to invest. The people we surveyed who have yet to adopt RTLS showed less eagerness to invest. Meanwhile, those that have adopted the technology understand its benefits, and are much more positive about its usefulness and impact. This indicates that it is important for manufacturers to engage with RTLS providers on how to introduce new technologies into their existing infrastructures. So, despite investment being daunting, with the right support, manufacturers should be spending now to save in the future.

"It is increasingly important for organisations considering IoT or RTLS systems to engage with a provider that has sufficient experience of what is truly involved in adopting these technologies. Knowing the true total costs involved, the types of technology combinations necessary, and the expected reliability of any system deployed will avoid unnecessary and costly science projects that deliver only limited benefit."

Steven Manifold,
Chief Marketing Officer, Ubisense

However, there are reasons to be positive as manufacturers do recognise the financial benefits of IoT. Encouragingly, three quarters of organisations (**76%**) are more likely to invest in the technology because of the current economic climate. When it comes to RTLS specifically, more than half of people surveyed agreed that investing in this technology could help ease the impact of some of their most pressing economic challenges, such as supply chain disruption (**55%**) and employment shortages (**50%**). Manufacturers listed a reduction in assembly cycle times (**16%**), an improvement in the quality of their output (**16%**) and the elimination of manufacturing errors (**15%**) as their top three most desired outcomes from investing in RTLS.

Manufacturers also believe RTLS can solve financial challenges, with three-in-five (**60%**) of them sharing the view that the technology can help them control costs. This figure rises to **80%** amongst organisations from Japan. Automotive (**63%**) organisations are more optimistic than their aerospace (**51%**) and defence (**49%**) counterparts that RTLS will help ease supply chain disruption.



70% of manufacturers believe that those who fail to implement RTLS will be left behind

Along with its potential to solve financial and operational challenges, RTLS is also believed to be an imperative technology for the future of manufacturing. More than two-thirds of organisations surveyed (**70%**) believe that those who fail to implement RTLS will be left behind. What's more, there is a consensus that these solutions will be ubiquitous by 2028. The findings have highlighted the growing importance of location-based technologies in manufacturing and demonstrate why organisations must act now. If they fail to do so, they will not only lose resources and miss out on operational benefits, but also lose pace with their competitors.



Real-time location systems will become ubiquitous in manufacturing

While many manufacturers understand the benefits IoT technology can bring, economic and operational pressures have impacted the rate at which solutions are being implemented. The research has shown that adoption of IoT is on the rise, but there is still quite a lag in the number of manufacturers that are embracing RTLS. This is concerning. Organisations admit that they are failing to achieve full visibility of their operations at a time where this is critical to business survival. Key operational objectives and pain points are being missed because manufacturers cannot see the full picture across their organisation, including the manual and moving parts of their assembly processes. It is often the case that equipment cannot be found, processes are inefficient and human tasks cannot be tracked – leaving many manufacturers wasting precious time and resources.

As organisations struggle to overcome both operational and financial challenges, the time has come for better understanding of how IoT can be effectively used in manufacturing. Manufacturers believe RTLS will be ubiquitous by 2028, so investment in the technology is imperative now. Yet while there is a willingness to invest, there is also a perceived complexity contributing to delayed adoption of RTLS. While this may seem to be causing a major barrier for manufacturers to benefit from the technology, the answers we received from organisations that have already adopted RTLS suggest this can be dispelled with education around the technology.

Manufacturers can overcome these challenges by speaking with trusted RTLS providers, like Ubisense. Rather than dwelling on, or risk being confused by, the science project phase of RTLS that plagued the noughties, manufacturers can learn from our experience. We have implemented more than 1,000 real-world, mission-critical, at-scale deployments over the past 20 years to help manufacturers optimise their current IoT investments, showing them how to introduce new technology effectively and improve their operations. By working with Ubisense, manufacturers benefit from our expertise to overcome the complexities and realise the full potential of IoT technology in their operations.

About Ubisense

Ubisense gives software systems intelligence about what's actually happening in the real world by tracking the real-time location, movement and interaction of people, devices and products through its **SmartSpace®** software platform and **Dimension4 Ultra-Wideband** sensors. Through an open architecture platform, business users can easily configure the planning, monitoring and control of physical process flows.

Headquartered in Cambridge UK, **Ubisense** operates globally with more than 1000 customers, transforming their physical space into **SmartSpace®**.

For more information visit: **Ubisense.com**



To find out more, contact us on:

US +1 720 217 4397 UK +44 1223 53 5170
DE +49 211 229733-0 FR +33 1 57 40 84 51

www.ubisense.com

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