Industrial IoT

It's high time to get started !

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Business Services

orange™

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Industrial IoT is the new "normal" – or should be if it is not the case for you yet!

IIoT… What do you mean?

In today's ultra-connected environment, digital transformation has become a key topic for businesses. Digital transformation refers to all the changes associated to the application of digital technologies in all aspects of human society. This also includes industrial activities, which have undergone through a deep transformation which originated the Industry 4.0.

The **Industrial Internet of Things**, also known as IIoT has been a **major pillar of the Industry 4.0** and can be defined as the network of intelligent and connected devices aiming at facilitating the industrial digital transformation. It is built around five stakeholders:

- Infrastructure service providers
- Industrial cloud platform providers
- Industrial app/software providers
- OEM's and other players enabling connectivity of equipment to the cloud
- End users connecting devices and using value-adding apps

The IIoT market was valued at **~ USD 145 bn**

91% respondents think IIoT is **crucial** for the **success and transformation** of the company

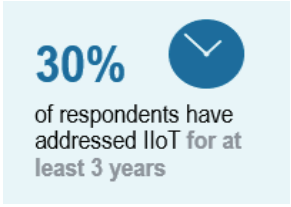
87% respondents think IIoT is a strong **contributor** to **digital transformation**

87% respondents have at least **started planning** IIoT implementation

in 2017 and is expected to reach around USD 232 bn by 2023[1]. IIoT includes a wide range of uses and serves different stages of a company's activities. It can be divided in several use cases such as predictive maintenance or fleet management. Taking a detailed look into these segments, the worldwide predictive maintenance market was valued at USD 2.2 bn in 2017 and could reach USD 15 bn by 2023[2], meaning it would grow at a ~39% CAGR. Regarding fleet management, the worldwide market was valued at USD 3.9 bn in 2017 and is expected to grow at a 21.5% CAGR to reach USD 12.7 bn in 2023[3].

Entering the IIoT universe

IIoT is now a reality! For **90%** of respondents, it is not only seen as a **strong contributor to the digital transformation** but also as a **crucial** aspect for both the **company success and its transformation**. Furthermore, **30%** of respondents have been investigating it for **at least 3 years**!



The Industrial Internet of Things has been strongly gaining ground within industrial operations and it is quite sure that today, **IIoT is more than a certainty, it is a reality**. It has become a priority for industrial players which are starting to see more as a key element to its activities: **IIoT is no longer the "extra mile" for their value proposition, it is the norm.**

Indeed, 32% of interviewed companies have a defined strategy currently being implemented whereas 30% are in the post-evaluation and strategy building phase. This means that overall, **60%** of interviewed companies already **have a strategy or are currently building one**. Everyone is taking part in it and this aside from any geographical, industrial or company-size differentiation.

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[1] *Industrial Internet of Things (IIoT) Market - Global Industry Perspective, Comprehensive Analysis and Forecast, 2017 – 2023*, Zion Research, July 2018

[2] Predictive maintenance refers here to condition monitoring enhanced by advanced statistics, stochastics, real-time analytics or machine learning algorithms. Such processes will be able to make predictions on when equipment may fail. Thanks to such actions, companies are able to take preventive actions to avoid failures on their daily operations. *Predictive Maintenance – market report 2017-2022 - Moving from Condition-based Maintenance to IoT- & Analytics-Enabled Predictive Maintenance*, IoT Analytics, March 2017

[3] *IoT Fleet Management Market - Global Industry Analysis, Size, Share, Growth, Trends, and Forecast 2016– 2024*, Zion Research, August 2018

The amount of companies that have not entered the IIoT adventure yet is low as only 13% of respondents consider there is no IIoT implementation at all within their companies. So… **what are you waiting for?**

IIoT, what for? From the inside out

The end-game – or the dream: leverage IIoT for both top line and cost structure in a respectful and secured environment

Survey shows that a big part of the players of the industrial competitive landscape are already implementing IIoT solutions. The question now is, why are they doing so?

Companies expectations towards IIoT are equally divided between **top line** related topics and **cost structure** related topics, as 48% of respondents have said they focus their IIoT hopes on the first and 52% on the latest. Overall, top 1 expectation is **productivity improvement**, whereas **customer relationship improvement** and creation of new **business models** complete the leading trio, each of them with around 11% of total answers. IIoT is then seen as a way to improve companies' operations, its interactions with its environment and thus its entire business model.

However, it is important to keep in mind that IIoT means connecting several devices and working in a new ecosystem. By definition, IIoT brings together a multiplicity of devices in a heavy digitalized infrastructure mobilizing big amounts of data. This entails new ways of working and above all, the obligation to ensure the **data privacy** for companies, their clients and all third parties related to

Case study

hellmann Calipar
HEALTHCARE LOGISTICS

Staying cool with IIoT: a monitoring example - Hellmann Calipar Healthcare Logistics

Hellmann Calipar Healthcare Logistics (HCHL) is a joint venture between German Hellmann Worldwide Logistics and Indian Calipar Integrated Logistics. It manages **pharmaceutical and healthcare logistics** and is thus required to meet specific quality standards. Since it started its operations in 2010, HCHL decided to introduce IIoT devices in its Dubai 10 000 m^2 logistics hub to **monitor the temperature and humidity in controlled storage areas and frozen products**. It equipped its facilities with single temperature sensors and dual temperature & humidity sensors strategically located to cover all the areas and get the wireless signal. This not only allowed HCHL to meet the required Good Manufacturing and Distribution Practices but also to protect its assets. Furthermore, it allowed HCHL customers to have a clear visibility over the supply chain. In 2018, it was awarded "Pharmaceutical supply chain of the year".

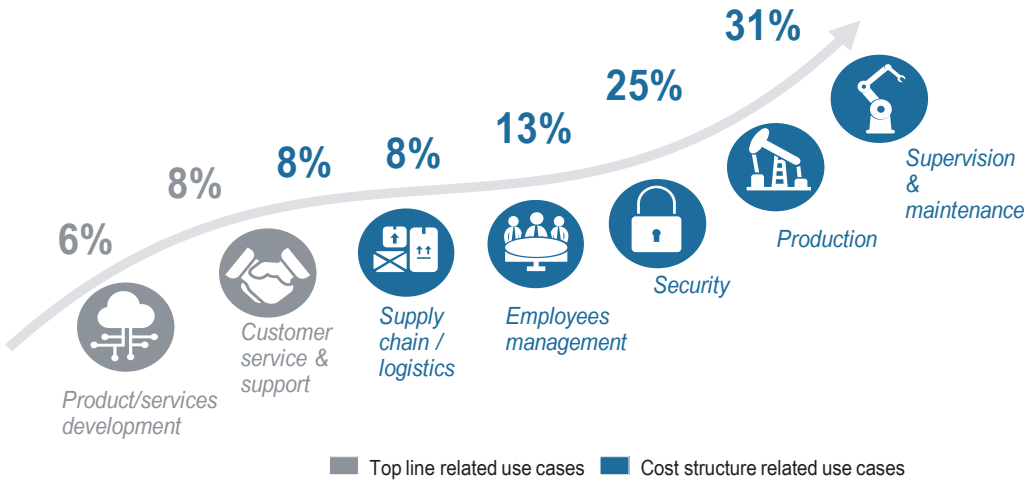
them. This has become a major issue, especially since the entry into force of the General Data Protection Regulation in May 2018 and is currently seen as the second biggest challenge companies have to face when introducing IIoT.

Moreover, IIoT has been considered by most companies as a tool for **internal usage only**. In fact, when asked if they have any intention to monetize data, 60% of companies assure they do not. IIoT then appears to be a way to reshape a company's internal operations and its implementation could be a way to optimize or improve the already existing processes.

The status: it all started with the most obvious and mature levers of cost structure optimization

Focusing on use cases, it is interesting to highlight that the most popular use cases of companies already implementing IIoT solutions, are those related to **Supervision & maintenance**. The following figure gives a non-exhaustive list of identified addressed use cases:

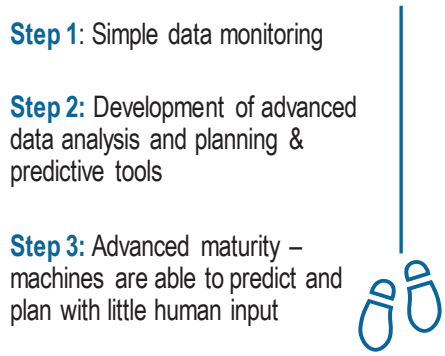
Figure 1: IIoT addressed use cases categories



As shown by the figure, the most common use cases are related to three main categories: **Supervision & maintenance, Production and Security**. When analyzing each of the use cases within these categories, it can be highlighted that they all address **real-time and monitoring** related issues.

Looking on processes, it is possible to notice that companies' evolutions on the way they process their data are marked by trees main levels, as shown by Figure 2.

Figure 2: Data treatment evolution



Although companies, at first, perform static analysis on collected data, this approach evolves towards new, more sophisticated data use such as planning. At this stage, it is still the employee who defines action plans. In the ultimate data maturity stage, data will not only be used to see what has happened and how to plan activities, but machines will be able to give more inputs, such as suggesting timelines or defining action plans with as little human input as possible.

Case study

Air Liquide

When remote control becomes real - Air Liquide plant network digitalization

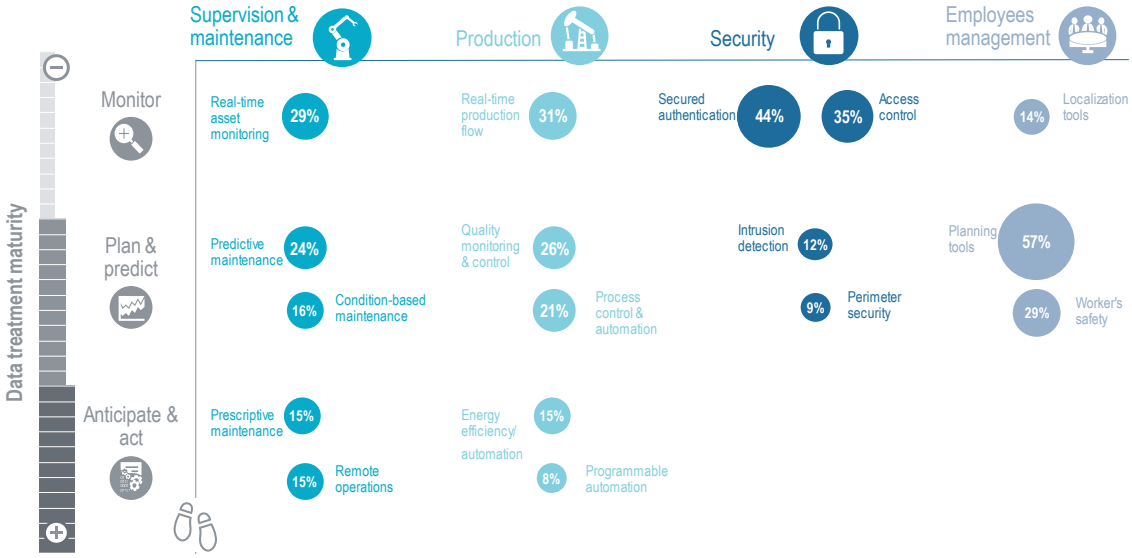
Air Liquide has enhanced its digital transformation through the implementation of **remote operations** and optimization centers. First capabilities were implemented in France in 2017 but the program was extended to South Asia in early 2018. The control center for France was introduced near Lyon but had a **nationwide vision of customer needs**: workflows of each unit were adapted in real time to specific customer needs. This program enabled remote operations for 22 of the group's facilities in France. This was possible thanks to 24/7 **big data analysis** but Air Liquide is also willing to introduce **predictive maintenance** by identifying weak signals that precede a malfunction. Other technologies such as tablets or 3D scanning are also being introduced in factories and will allow to simplify maintenance and inspection management operations as well as daily operators' tasks.

Let's focus on **monitoring** activities. Taking only the Supervision & maintenance category for instance, the most common use case is real-time asset-monitoring which represents around 30% of all addressed use cases. The same trend is visible for **Production**, with real-time production flow monitoring (30%) being the preferred use case, and for **Security**, with Secured authentication and Access control as indisputable use case leaders (80%).

The same goes for **planning and prediction** related topics, which are also ranked amongst the most popular use cases and are especially applied to maintenance and employees planning tools, the latest accounting for 57% of all the employees' management-applied use cases.

Figure 3 shows the details of use cases for top 4 addressed cases categories.

Figure 3: IIoT use cases by main category



The above-mentioned levers are those in which data processing has existed for the longest time. Companies are indeed used to monitoring data or to using it for planning activities so, why would introducing IIoT for these usages be a big deal? The real challenge comes when use cases leverage advanced technology. But these specific cases remain low. Indeed, prescriptive maintenance, remote operations, programmable automation or localization tools are still to be developed and account for a minor share of total use cases.

One main observation is brought out by this figure: **the more the category has been historically digitalized, the more it has introduced IIoT use cases**. The key to IIoT could then be… give it some time!

Case study

amazon go

Looking for a futuristic shopping experience? – Go, Amazon Go!

Amazon is going physical! Forget about long lines or waiting for the cashiers. With the new Amazon Go store, shoppers will be introduced to a totally **new retail experience guided by technology**. Before entering the store, they will already feel like something different is waiting for them: a row of gates guard will let them in only if they have downloaded the Amazon Go app on their mobile. Once in, customers can grab items directly from the shelves and they will be automatically added to the shopping cart of their online account. This is possible thanks to **image recognition software and artificial intelligence** that allows Amazon to see what happens inside the stores. There are already three stores in Seattle, two in Chicago, with plans for new openings in Chicago, San Francisco and New York City.
This is an example of how IIoT has changed operations in the store and is allowing companies to present their customers a totally new digital experience.

Does it work? No winners so far? It is a marathon so don't lose faith and keep going!

Clearly not the Eldorado?

IIoT has been a leading trend regarding technological evolutions and as it was already mentioned, **it is more than a certainty, it is a reality**. However, is it possible to evaluate the impact it has had on companies that have already implemented it? As mainstream as it may seem, the IIoT implementation path is not an easy ride and the weight of **uncertainties** remains important.

When looking at satisfaction levels, a first observation must be made: **overall satisfaction** regarding IIoT is surprisingly **low** with an average at only 5.8 out of 10… but, how to explain it?

First of all, it is important to recall that amongst main expectations regarding IIoT, companies mention **productivity improvement** as its number one expectation and **cost reduction** comes in the fifth place. On the other hand, the most important challenge for IIoT is the **uncertain ROI** and the **lack of a concrete business case**. This challenge can prove very hard to overcome since payback remains unclear and of course, why would you want to invest if you don't know what are yourself and your company getting into? Around 90% of respondents could not tell if they have gotten a quick payback over their IIoT investments and only 4% strongly believe they got their payback as fast as expected. And then, how can companies be satisfied if their main expectations are not necessarily fulfilled because of the important challenges IIoT has to overcome?

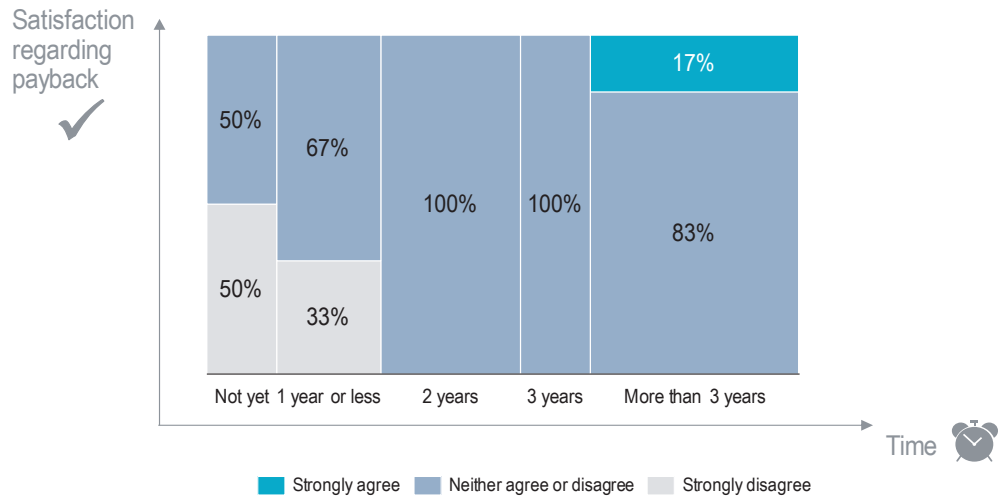
Moreover, a pessimistic conclusion on IIoT can be drawn, as two thirds of respondents consider that, regarding IIoT implementation, they are at parity or lagging behind their competitors. No champions nor big leaders for IIoT? This seems to be indeed the case as 75% of respondents are still at early stages of data maturity.

It is a multi-year marathon that has just started…

But, how can leaders emerge if the market is not yet mature? More than 50% of the companies interviewed have been implementing IIoT for less than two years. So, after all, it is probably just **a matter of time**!

When comparing companies' satisfaction with the time they have been implementing IIoT, one point must be made: satisfaction increases with time. When analyzing the results to the question *"Did you get a payback from your IIoT implementation as quickly as expected?"* the analysis shows that most satisfied companies are those which started IIoT implementation at least **three years** ago.

Figure 4: Correlation between payback expectations and IIoT implementation time



Less satisfied companies are those which only recently started implementation or those which have not implemented it at all because they are reluctant to doing so. Between a one and three years-time implementation, companies do not have clears views on the matter and a real satisfaction regarding IIoT only comes after at least three years, which means companies need an adaptation time to adjust their operations and their corporate culture.

… and there is indeed light at the end of the tunnel!

IIoT is after all a **long journey**… That said, it does not mean there is no light at the end of the tunnel! Research has shown that in spite of the lack of business case, IIoT generates important **qualitative benefits** for the organization and seems to have a positive effect on both employees and customer satisfaction. 67% of respondents agree with the fact that IIoT increases employee satisfaction and this figure reaches 92% when it comes to customer satisfaction. It is then important to understand that launching an IIoT project requires patience as results will not come overnight. IIoT usually requires companies not only to deploy new technologies and infrastructures but also to give time to the organization to get use to handling new kind of machines and data.

Furthermore, as already shown by figure 3, **the more time IIoT has been implemented, the more the payback satisfaction improves**. 17% of companies having implemented IIoT for more than three years, consider they have had a quick payback, a strong improvement when compared to companies that have been implementing IIoT for two or three years and that do not have clear views on payback satisfaction.

But survey also shows some **positive figures:** one third of companies consider they are leading the way or at least are ahead of peer companies regarding IIoT implementation and around 25% are performing advanced or digital twin-like analytics.

It is important to keep in mind that introducing new technologies takes some time and is not always easy. It requires **adaptation from the market** and, what is even more challenging, to **educate the consumers** and show them the benefits of new entrant products. Let's take for example the B2C equivalent of IIoT: the smart homes market. The number of households with smart systems was estimated at ~80 million worldwide in 2014, reached ~160 million in 2017 and is still expected to continue this performance to reach almost 300 million by 2023[4]. Such development has required customers to get use to **sharing** their **daily routine with new devices**. This positive trend has been strengthened by the increasing smartphones penetration which has even allowed people to

Case study

FESTO

On the way to energy efficiency - Festo's smart factory

Festo, a valves manufacturer has developed a smart factory in Germany. It all started in 2011 when Festo started planning the plant which opened in 2015 and has been continuously evolving. One of its main pillars is its energy efficiency component, in a factory where around 20% of electricity comes from own power generation. In order to keep energy consumption to a minimum, the factory has joint communication platforms that make sure the energy interaction between the building equipment and the production system are taking into account. With dependent processes, the factory can distribute the energy in a most optimized way. Energy is distributed to the site by two natural gas-operated combined heat and power stations. Combine stations generate electricity and heat at the same time, leading to a **95% overall efficiency**. This system also allows to **save around 1500 tons of carbon dioxide per year**.

[4] *2018 Global Smart Home Forecast*, Strategy Analytics, May 2018

improve their **knowledge and skills** on how to handle all these new devices. Market research has shown that in Europe, in 2016 and 2017, smartphone penetration was around 48% and 53% respectively. This figure is expected to increase to ~56% in 2018 and forecasts expect a ~61% penetration by 2021. The time has come where **interactions between people and devices** are rather **seamless** and these positive trends should be good news for IIoT. Indeed, having connected devices at home could be the first step to overcome reluctances and welcome connected devices in the business environment. After all, why would you exclude connected devices from your company if you already live with them? For sure the type of implementation, the mobilized resources and the stakes in both cases cannot be compared and IIoT may not develop as fast as the smart home market. Nevertheless, it is at least a way to help people be more familiar with (I)IoT.

Case study

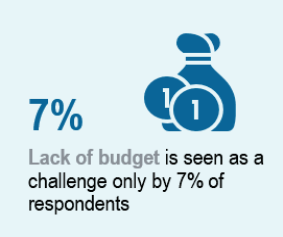
e.l.m. leblanc

Improving both B2B and end customers satisfaction – e.l.m. leblanc & its connected boilers

e.l.m. leblanc developed, with the support of Orange, its connected boilers offer. Thanks to these boilers, it is able to provide its B2B customers (boiler installers and landlords) with data that allow them to improve their activities by optimizing the way they send technicians to do the maintenance and repair visits. Before the connected systems they had no information on the health status of the boiler or which spare parts the technician would need to have in his car when going to a client visit. New information facilitated by the connected boilers has allowed installers and landlords to optimize their operations and give their clients a better service. To go even further and prevent unexpected equipment failures, e.l.m. leblanc has already been developing predictive maintenance tools leveraging the flow of data coming from the boilers. With this business model, the company has been able to identify opportunities to bring benefits to its B2B customers and subsequently help them bring benefits to end-customers as well.

What do you need? it is not (all) about money!

Money is not an issue



What would be one of the top concerns, if not the top, when starting a new project? Probably budget? This may seem a very normal answer but when asked about this, survey respondents thought otherwise, and **budget issues only ranked 7 amongst 12 challenges related to IIoT implementation, with 7% of total answers!** Budget actually ranks behind organization-related issues such as the short-term thinking and operational-related issues such as the complexity of the offer, the rapid evolutions and the absence of clear use cases.

Case study

CARGOTEC

Towards a service-oriented approach – the Cargotec example

Cargotec is a leading provider of cargo and load handling solutions with the goal of becoming the leader in intelligent cargo handling. The company teamed up with Orange to deploy IIoT across its three business areas Kalmar, Hiab and MacGregor. The implementation was enhanced around four years ago and **has had an impact on both internal and external operations**. For example, thanks to a clear overview on spare parts needs, the company has been able to optimize internal operations and provide faster and more accurate service to its end-customers. From an external approach, IIoT has enabled Cargotec to shift from a pure machinery business to a more complete machinery & services approach. For instance, it can now guarantee customers a given fuel consumption level based on other machines performance, having thus an impact on end-customer operations and efficiency. Furthermore, Cargotec's on-road load handling business area Hiab offers the **HiConnect platform,** which allows its customers to **receive real-time data about their equipment's operation and condition.** Thanks to this solution, Cargotec provides end-customers with web-based dashboards to help them monitor status, plan service and improve units and operators' operations.

IIoT has increased Cargotec and its end-customers operational efficiency but the organization had to keep in mind that these changes come accompanied with several challenges, the main one being getting the whole organization onboard. It is then crucial for such projects to understand the company as a group so that everybody can take advantage and learn from what IIoT brings.

Companies are willing to invest and have the possibility to do so. Money is not a main issue but is it possible to invest without having at least an idea of where the investments are going and whether it is going to be profitable or not? If budget is not a top challenge to IIoT implementation, then what is?

Not an issue per se, but…

According to the survey, the first challenge appears to be… the **lack of a concrete business case** and **ROI uncertainties!** Budget is not an issue, but the fact remains that the first key success factor regarding IIoT is the capacity to **identify and select use cases** relevant for a company's environment and strategy, and this considering the **risks of high cost, uncertain ROI** and short-term thinking. Budget itself is not an issue but the main challenge is still related to money concerns.

The problem with IIoT is that it is very hard for companies to have a **clear view on profitability** or on how much **time** it will take to see the first results of such big investments. Why big investments? Because as it has already been mentioned, IIoT requires not only money but also flexibility and mobilization within the company. If **understanding the needs and potential of IIoT** ranks as the first Key Success Factor for IIoT, **strategic alignment** within the company is number 2.

What "money can buy" or facilitate

Having a good financial back-up is certainly very important and can make a difficult task a lot easier. In fact, budget can certainly help companies when it comes to preparing and implementing IIoT. It allows for instance to hire all the adequate experts that will be able to identify the IIoT solutions and to drive changes within the organization. Actually, **dedicating teams to identify IIoT opportunities** ranks as second priority when preparing the company for IIoT implementation and **hiring people with the right skills** arrives in 5th place.

> *Encouraging internal innovation is a major measure to implement IIoT*
>
> Head of department of a large utilities company

Both tasks are highly important but cannot be accomplished if the company does not **allocate them enough resources**. Lack of technical capabilities and rapid technological evolutions are both

> *Today, there is no understanding of what IIoT is*
>
> Head of department of a large utilities company

considered as challenges for IIoT. In a rapidly evolving environment, IIoT can easily be beyond comprehension and companies can struggle to understand what IIoT is and why and how it will enhance its operations.

To overcome this problem, companies need to allocate the necessary resources and make a budget available in order to **encourage research and development** activities or to hire people with the adequate skills.

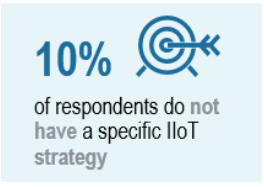
> *We had to work hard with lots of departments to define some new ways to do project management. We were supported because it was an exciting project. We all knew we wanted to move to the service and that our future will be defined by the success of our connected device*
>
> Emmanuel Bricard, e.l.m. leblanc - CIO

These challenges can in part also be overthrown by collaborating with various external players. **Seeking for advice from third parties and consultants** is actually a top priority for companies that have decided to implement and ranks third amongst priorities.

Finally, deploying **other technological tools to complete IIoT** seems to be a "must". Cloud Computing deployment has been gaining ground and appears to be a first compulsory building block along with other technologies a little less popular such as Edge Computing. **76%** of companies which took part in the survey already have cloud technology to support their IIoT solutions. However, deploying this kind of tools demands flexibility and adaptation. But, is that something money can buy?

What money won't buy

IIoT implementation does not only need a consistent budget. It also demands a certain ability to drive the organization in order to develop a solid **strategy**. This last point is considered as the third most important challenge companies have to face when implementing IIoT. However, 10% of respondents declared not to have an IIoT strategy!



Thereby, having **clear and established guidelines** appears to be crucial to IIoT implementation. What better way to motivate employees than to show them where all the transformations are leading and what is the role each of them is going to play in all the process?

> *All "things" which crucially need connectivity already have it today. Future IoT is a low value low margin product*
>
> Support function of a large telecom company

Onboarding employees on the new processes is then a key responsibility but needs one important element: having a **management with strong leadership skills** able to drive the organization by encouraging all stakeholders and mobilizing the company. In fact, for some departments within the organization that have little contact with operational tasks, it may be harder to understand the benefits of IIoT. Support functions tend to have a less clear view on IIoT as they have not necessarily developed a dedicated strategy and 20% of them do not see this kind of technology as crucial to the company.

When embracing IIoT, the entire organization must be mobilized but this is still seen as a challenge by 13% of respondents which have already gone through an IIoT implementation process and is highlighted amongst most important key success factors by respondents.

How to move forward? It is everyone's matter and concern

IIoT is everyone's business

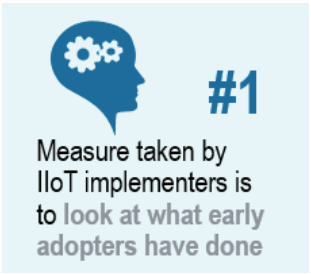
Opinions about IIoT are shared across players of the competitive landscape, no matter their geographical footprint, their industry or the size of their company. Everyone is aware of IIoT and everyone tries to look at what their peers are doing! The first measure undertaken by companies when getting ready for IIoT adoption is to actually look at what has already been done in order to **learn from these previous experiences of early adopters**. It is then clear that IIoT is mobilizing different stakeholders of a same company.

The matter of key executives

IIoT mobilizes all stakeholders of a company to be sure but who has the last word on whether to implement it or not? Research shows that usually, this responsibility belongs to **senior executives and heads of departments** as they are the ones who have introduced it IIoT to their respective companies in 80% of the cases. It is also their responsibility to share with the rest of the organization what IIoT means and how it is going to enhance daily operations. This will allow employees from all departments to feel more involved. Key executives need use their **leadership** to make sure **IIoT is shared and accepted** by all the stakeholders of the organization.

The matter of both big AND small companies[5]

One of the key words that comes to mind when thinking about IIoT is **network**. IIoT usually rimes with a network of connected devices managing huge amounts of data. But this word can also be applied to the fact that companies **see what their peers have done** (first measure undertaken when implementing IIoT) or want to do and that they can also tend to look for **external growth options** through JVs, alliances and M&As (fourth most popular measure undertaken when implementing IIoT). No matter their size, all companies are on the IIoT move!



[5] Large companies include those with more than EUR 1 bn worldwide turnover and over 5000 employees worldwide. Medium & small companies include those with less than EUR 1 bn worldwide turnover and less than 4999 employees worldwide.

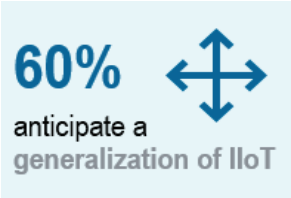
The most interesting observation is that big and small companies have both specific things they look at and specific capabilities that complete each other. What type of specificities can each of this companies bring? Big companies seem to have more **experience** on IIoT topics. In fact, only 1/3 of them do not have IIoT implementation or at planning it whereas this figure increases to 54% for small companies! 35% of big companies have been implementing IIoT for more than 3 years but this figure tumbles to 22% for small & medium companies. But this does not mean the little players have nothing to bring! By its own size, these companies tend to be more flexible and welcome changes more easily. Thereby, this could also mean that they are more likely to enter the IIoT adventure. Actually, 45% of them consider themselves to be leading or at least ahead in the IIoT implementation journey. Furthermore, small and medium companies give more importance **top line related topics**. Around 24% of addressed use cases for this segment of companies have to do with top line topics but this figure falls to 11% when analyzing big companies.

The matter of third parties and IIoT experts

IIoT is for sure a topic that serves industrial manufacturers above all. Nevertheless, it is a very technical topic that demands strong technological knowledge. It is then important for companies to ask for the right advice in order to maximize their chances to get successful results and to be surrounded by the right partners. When asked about the **trusted advisors** for implementing IIoT solutions, number 1 trusted advisor turned out to be **IIoT experts**, followed by **technological companies** in second place.

These partners mission is to guide the companies along the IIoT journey and to show them that even if results can't be seen immediately, they do exist, and they will improve their operations for both top line and cost structure activities. Such partners are then essential for companies as they provide invaluable **know-how** that is not easily found within companies because of the rapidity and technicity of IIoT related topics.

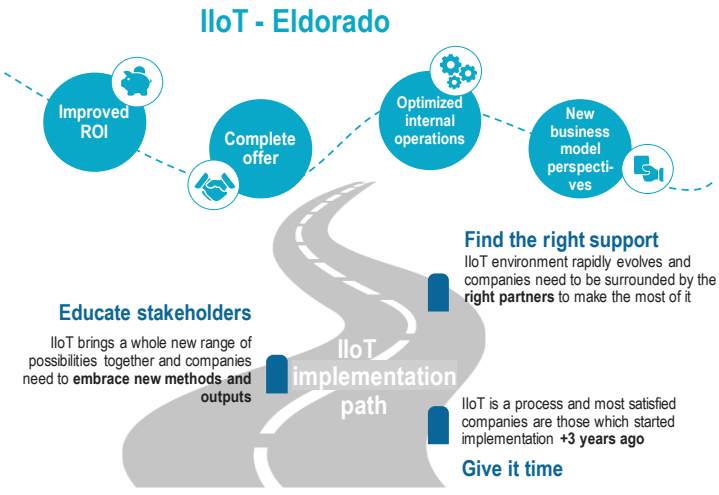
These trusted advisors have already been addressing these topics, as have industrial players. It is important to keep in mind that, for instance, **~20%** of respondents of the survey have been **addressing IIoT for at least 3 years** now.



One of the most relevant key findings of the survey and a very useful figure to keep in mind is that around **90%** of respondents have **already at least started planning IIoT**! Besides, more than **60%** of respondents anticipate a **generalization of IIoT in their companies** in the forthcoming years. This not only means that companies that have not addressed the topic yet should start thinking about it but also that they **don't necessarily have to worry**! Players across industries and trusted advisors have been **capitalizing IIoT knowledge** for some time now, so new comers will **have an easier way to go than early implementers**. IIoT is still building its way through industrial players but it is a reality and it **will be strengthened in the years to come**.

Technology is getting **better and cheaper** and **research is more and more extensive**. IIoT is not an exception anymore but it is progressively becoming the norm. Companies need to have the benefit of hindsight when looking at it to understand that it is not something that comes overnight. It requires an adaptation period for all the stakeholders to get used to what is coming. This not only means being aware that machines are changing but also understanding that these changes are modifying and **improving** companies' operations and work approaches.

However, **IIoT is a need for today's industrial players as it empowers companies and opens the door to new opportunities** in terms of internal operations, service offer and business models. It is also a **unique opportunity** for companies to rethink their business models and enhance their operations. IIoT demands changes for sure but it is important to keep an open mind and **focus on its benefits**. IIoT implementation is a matter of **investing on machines and educating organizations to new working approaches**. Maturity and the right IIoT appropriation are above all a matter of time. **Companies need to start as soon as possible and to look at IIoT with perspective** and have the **right support** and **education** and a seamless implementation will follow, with all the benefits it entails.



Glossary and definitions

- **IIoT:** Industrial Internet of Things
- **OEM:** Original Equipment Manufacturer
- **B2B:** Business to Business
- **B2C:** Business to Consumer
- **ROI:** Return On Investment
- **JV:** Joint Ventures
- **Predictive maintenance:** predictive maintenance as referred in the first part of this report refers to condition monitoring enhanced by advanced statistics, stochastics, real-time analytics or machine learning algorithms
- **Fleet management:** fleet management as referred in the first part of this report includes solutions such as Drive Time Analysis, Driver Information System, Fleet Analytics, Fuel Management, Remote Diagnostics, Routing Management, Tracking and Monitoring, and Vehicle Maintenance
- **Prescriptive maintenance:** Prescriptive maintenance as shown on Figures 1 and 3 includes solutions such as machines self-diagnosis and schedule maintenance
- **Small and medium companies:** Small & medium companies include those with less than EUR 1 bn worldwide turnover and less than 4999 employees worldwide
- **Large companies:** Large companies include those with more than EUR 1 bn worldwide turnover and over 5000 employees worldwide

Sources and methodology

This White Paper is based on multiple sources and studies as well as a web survey. It was produced with the support of Roland Berger.

Consulted studies:

- *Asset Tracking and Fleet Management - Market opportunities for connected objects*, IDATE Digiworld, May 2018
- *Industry 4.0 & smart manufacturing market report 2018-2023*, IoT Analytics, November 2018
- *Mastering the Industrial Internet of Things (IIoT)* – Roland Berger, September 2017
- Press research and public information available, especially on use cases

Web survey:

Survey was shared with **key executives** from European industrial manufacturers and the main goal was to understand their expectations and business priorities in terms of Manufacturing IoT. It was also shared on social media and was available for 6 weeks, from October 1st to November 12th. Respondents are located all over Europe and come from different backgrounds: several industries, small, medium & large companies and different positions within the organization. Main questions addressed issues surrounding **IIoT implementation processes, expectations, challenges and use cases** within players from several industries including Industrial Manufacturers, Utilities and Transports, aerospace & automotive. Data were then processed according to simple and cross-tabulated analysis. Outputs of those analysis are shared in this paper.

Interviews:

Orange would like to thank all the participants of the survey for taking the time to answer to it. A special thank you to its clients which kindly decided to share their own experience and points of view on IIoT implementation.