

5 Ways to Unite IT and OT

The manufacturer's complete guide
to unlocking the full potential of the
industrial internet of things (IIoT)



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Uniting IT and OT isn't just
a “feel-good” principle.

Foreward

What do companies like LEGO, Noosa Yoghurt, and Bar-S Foods all have in common? They may be in completely different industries, but these leading manufacturers have all realized remarkable success from bringing their IT and OT (operational technology) practices together. Integrating IT and OT has enabled these firms to do some amazing things, like using intelligent security cameras to automatically identify product loss incidents and quickly pivoting manufacturing strategies based on outside factors, including sales forecasts and even weather patterns.

Uniting IT and OT isn't just a "feel-good" principle. It's a strategic imperative for manufacturers looking to reduce their costs and compete effectively in a world where new technologies are quickly changing and transforming everything that surrounds them.

Manufacturers know that implementing IIoT strategies to coalesce data from production equipment, sales forecasts, product demand, and other sources, all in a bid to improve output and efficiency, is the future. The only way to reach that future is to bring the different skills of IT and OT workers together.

This e-book provides leaders in IT and OT with actionable insights into how they can combine both of their strengths to drive better business results.

Whether these outcomes are achieved by integrating data and analytics practices into every part of the business or by providing executives with greater visibility into what's happening on the factory floor, the possibilities are endless.



PART 1

Find common ground through strategic alignment

The road toward IT and OT convergence is fraught with challenges. After all, in many organizations, IT and OT live in entirely different worlds or, at the very least, have wildly differing priorities.



IT EMPLOYEES

IT employees prioritize security—things like protecting proprietary data from hacking or tampering—over all else.



OT EMPLOYEES

On the flip side, OT cares most about maximizing efficiency and uptime and less about stringent security practices, especially if they can hamper operational workflows.

This means that it can be difficult to find common ground between the two groups.

For example, OT might be enamored by the idea of using cloud services to monitor readings off of machines from anywhere, but IT might wince at the chance of data leakage and seek to block access to these readings from any device not issued and configured by IT.

What impact do these differing priorities have on IT-OT convergence?

Often, it can be difficult to get IT and OT employees to agree on a set of action items; after all, no one wants to waste time on projects they don't believe in. That's why it's absolutely crucial to first conduct an internal audit: take a close look at your business and the challenges you're facing, and get people in both the IT and OT departments to agree on what needs to be addressed immediately. For example, ensuring regular and meaningful communication between workers at different production sites could be a good place to start.

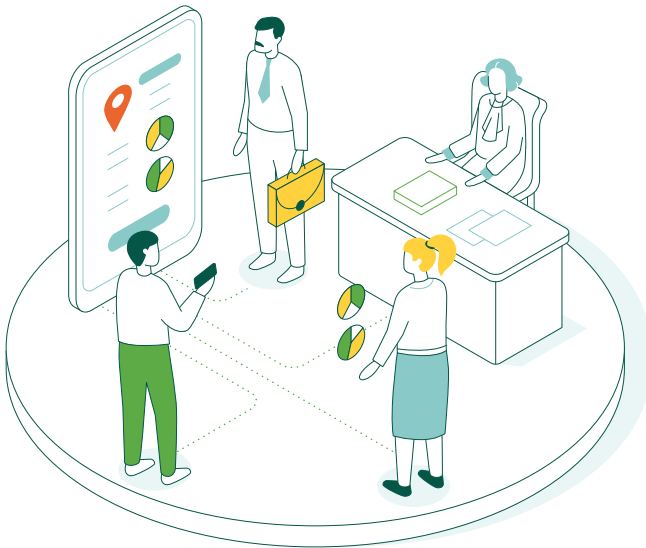


IDENTIFY SHARED CHALLENGES

Getting consensus on which problems to attack first is key to getting IT and OT in the same room—and on the same page.

Only once a challenge has been identified and a consensus has been built around it should you come up with a strategy to attack that challenge.

FORM A TASK FORCE



Devising a strategy also requires cooperation and representation from both camps. Handing off the planning process to a completely separate, unrelated, and unattached strategy group may seem like a smart form of outsourcing, but is actually a recipe for disaster. That's because this outside group likely has little to no insight into the specific priorities of the IT and OT workers who will actually have to work together.

Instead, marshal the resources of each IT and OT employee—all of whom have their own opinions and knowledge of the situation at hand—and empower them to devise a strategy together. Consider forming a joint task force that includes members of both departments. Per the above example, if the goal is to increase communication between workers at different plants, it would make sense to put a few workers from the production floor as well as a few technology strategists from IT into the same room.

Once a strategy is agreed upon, the likelihood of department-wide buy-in increases dramatically vs. if one group or the other were allowed to control the entire planning process on their own.

PART 2

Train for the future

In order to get IT and OT to start working together, people in both departments need to start speaking the same language.

Just as learning how to speak French, Spanish, or Mandarin takes time and patience, so too does learning how to communicate in the terminologies and concepts used by another department. Proper training is crucial to get people in IT to understand the wants and needs of those in the OT department—and vice versa. The failure to train each department on the other's priorities could undermine integration efforts by causing constant fighting and debate ("why can't you just understand where I'm coming from?!").

The focus of training should be on preparing IT and OT for a future where their duties are increasingly intertwined.

To that end, both camps should learn not only the job duties and responsibilities of the other, but also how they can work together on projects that require both of their skill sets. As IIoT systems are increasingly adopted by manufacturers, the need for this shared knowledge will only increase; OT might have to learn how to glean useful information from machines (a task typically relegated to IT staff today), while IT might be responsible for keeping that data secure.



TRAIN AND SHARE KNOWLEDGE

Proper training is crucial to get people in IT to understand the wants and needs of those in the OT department—and vice versa.

How can training best be delivered to employees?

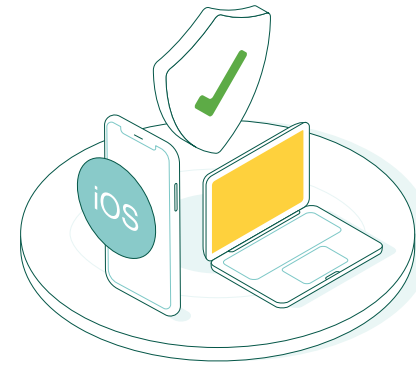
There are a variety of factors to consider. Ask yourself the following questions:



Do different employees need different levels of training? While a lower-level operations manager may need in-depth knowledge of IT infrastructure, a COO may only need to know about general IT principles and strategy.



Does your current environment have enough space and resources to allow IT and OT staff to come together and collaborate, or should you consider training employees off-site?



Does it make sense to partner with automation vendors and IT companies for training? Or would it be better to design a program on your own?

In the end, putting your IT and OT staff through training on each others' roles and duties can pay huge dividends.

Training can ensure trust, build camaraderie, and enable the sharing of valuable knowledge—all crucial things given the convergence between IT and OT roles.



PART 3

Create incentives

Even after common ground has been found and a solid plan has been created through the input of both IT and OT, it's easy to get discouraged by the difficulties that will inevitably arise.

For example, IT and OT departments may be used to adopt newer technologies and processes at varying speeds, or OT may perceive itself as being lower in the pecking order than IT. One way to ensure that these challenges don't overwhelm the organization and obstruct real progress is to create incentives that everyone involved in IT-OT integration can get on board with.

CREATE INCENTIVES

When IT and OT converge, some amazing results can materialize, both planned and unplanned.



Working toward a primary objective—say, reducing the amount of wasted inventory—can also lead to unintended but positive benefits, like lower materials costs and increased energy efficiency.

Since these benefits often impact the entire company, creating a company-wide incentive (for example, a bonus plan) may make sense. This type of incentive can increase buy-in while also increasing employees' willingness to work across department lines.

How can you start and sustain a constructive discussion between IT and OT? It begins by ensuring that the managers of both departments (likely the CIO and the COO) have common goals. An example of a goal could be something like “decrease production downtime by 15% vs. last quarter”—whatever it is, both the CIO and COO should agree it is an important objective and one that would stand a stronger chance of success if both leaders cooperated with each other.

The goal should spark discussions within both departments. For example, OT could start thinking about having production machines communicate in real time through IIoT, while IT could think about providing more people on the production line with visibility into other parts of the line. Helping employees see the bigger picture and providing both groups with an incentive to work collaboratively is key to ensuring teamwork.



PART 4

Adopt the right technologies

At the heart of IIoT and the future of manufacturing is technology. Without adopting the best technologies, workers will ultimately be driving down the road toward IT-OT convergence in a jalopy.



ADOPT TECHNOLOGIES FOR THE FUTURE

When deploying new technologies, it's important to make decisions that will pay off in the long term.

Your goals should dictate which technologies you adopt. If, for example, you're looking to improve security in production facilities, you may consider augmenting video surveillance cameras with wireless connectivity to help plant workers report suspicious activities from their smartphones. In another scenario—say your goal is to match production for a new product with customer demand—you may consider an MES system that can integrate with your company's overall ERP solution and adjust output accordingly.

But there are plenty more factors to consider. Budgets aren't unlimited, IT staff are typically difficult to scale across multiple locations, and costs for training workers on new tech can add up quickly.

Here are some things to take note of when considering which vendors to partner with and which solutions to choose:

Do you need to deploy new technologies across different locations?

How many sites do you have? The ease of deployment can play a huge factor here.

How many people need to be interacting with the new technologies, and with what frequency?

If many different people have to touch a new piece of hardware or software often, simplicity is a virtue.

Will the new technologies integrate well with existing systems?

Is there a long-term plan to replace old tech?

How secure are the new technologies you're considering adopting?

Can you count on your vendors to regularly provide security patches against new vulnerabilities?

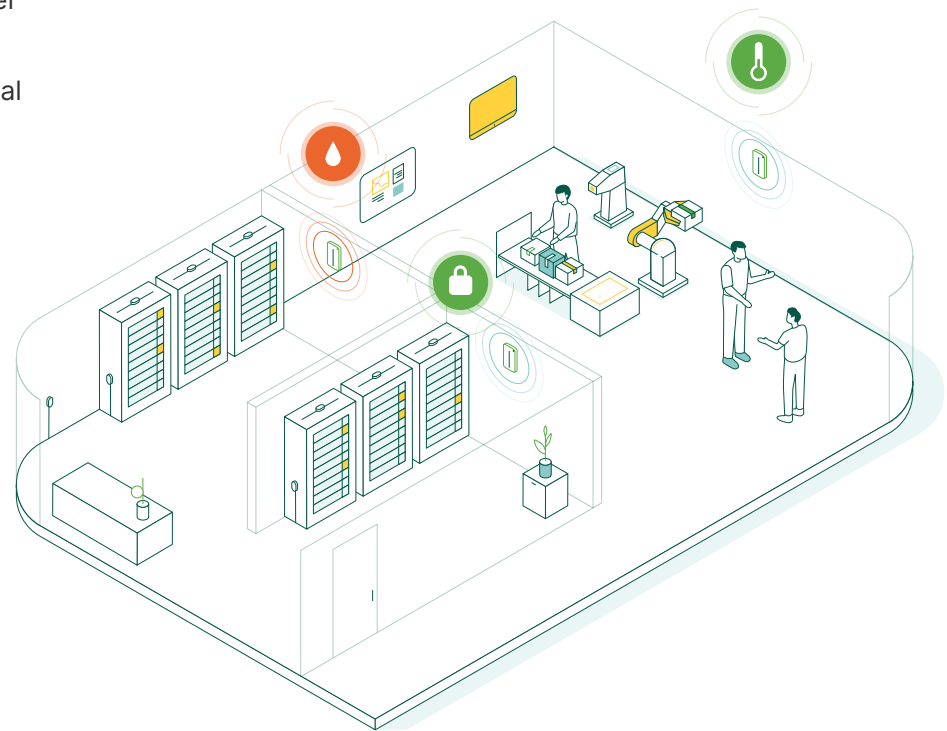


When deploying new technologies, it's important to make decisions that will pay off in the long term.

Any OT worker can testify to the longevity of manufacturing tech (whether that's good or bad)—just think of the number of PCs on factory floors that are still running Windows XP. No matter which vendors you choose, starting with a logical set of goals and asking the right questions is crucial.

THINK AHEAD

Manufacturing tech often stays on the plant floor for decades, so having long-term goals in mind is crucial when deciding which technologies to adopt.



PART 5

Dream big,
but start small

By now, you've got IT and OT to agree on a strategy, trained members of both departments, created the right incentives, and chosen the right technologies.

So far, you've done an admirable job of setting yourself up for success in terms of IT-OT convergence. But before you rush headfirst into revolutionizing every aspect of your operations, start with a smaller project that can show immediate returns and has clear objectives.

Marathon runners don't get off the couch one day and run 26.2 miles without training; similarly, when it comes to bringing IT and OT closer together, it pays to walk before you run.



To ensure you're choosing the right project to begin with, ask yourself a few questions:

Is there a key focus area that's priority #1?

Identify a business unit a business unit or process that currently has the most downtime, the highest maintenance costs, or the greatest energy consumption? Start there and start small—for example, invest in a vibration analysis tool that can automatically send alerts to staff when a piece of equipment malfunctions. The success of this small initiative can pave the way for further investments.

Can you get executive buy-in?

Even if rank-and-file employees from both the IT and OT departments agree on a plan of action, having executives voice their support lends more credence to the project. Moreover, communication from the top down helps prevent warring factions from emerging that threaten to derail the entire project.

Is this scalable?

Ideally, get IT and OT workers to think about small steps that can lead to larger improvements in terms of overall operations. That way, the strategies and technologies you adopt are likely to have a broader impact, increasing the willingness of both departments to invest their time, money, and energy in a new project.



Closing thoughts

For too long, IT and OT have lived on different planets, content to focus on their oft-divergent priorities and seldom coming together to work on projects. With IT looking largely at optimizing business operations and OT focused on improving manufacturing processes, finding common ground has proven challenging. Only recently have manufacturers realized that overcoming this challenge has moved from a “nice-to-have” to a necessity.

To ensure rapid and productive IT-OT convergence, manufacturers need these two departments to come to a consensus on which projects and priorities to take on first. They'll have to ensure IT staff are trained on the duties of OT workers, and vice versa, to ensure everyone is ready for a future in which their job responsibilities are more similar than different. They'll have to create incentives to motivate workers to come together. And last, but certainly not least, manufacturers will have to partner with the right vendors and choose the right technologies for an IIoT world. None of these tasks are easy, but all are important for manufacturers looking to shave costs and improve their operations.



Reading and internalizing the advice in this e-book is just the start. The road toward IT and OT convergence isn't fully concrete, and with technology changing at such a rapid clip, things will continue to evolve.

Ultimately, establishing a set of processes and imbuing a sense of opportunity in every employee is crucial to bringing IT and OT together—and taking manufacturing to the next level.



References

Brooks, Paul, and Brian Fortney. "Preparing your workforce: IIoT requires IT/OT talent convergence." *Manufacturing Automation*. November 1, 2016. <https://www.automationmag.com/6476-preparing-your-workforce-iiot-requires-it-ot-talent-convergence/>.

De Bernardini, Luigi. "The Challenge of IT/OT Convergence in Manufacturing." *Automation World*, July 25, 2016. <https://www.automationworld.com/home/blog/13315760/the-challenge-of-itot-convergence-in-manufacturing>.

Meet the Boss. "Standardized and Connected-Manufacturing Success." Bristol: Meet The Boss in assn. with Rockwell Automation. PDF e-book. <https://meettheboss.com/insights/standardized-connected-manufacturing-success/>.

Queen, Karen Haywood. "Come Together Right Now, OT/IT." *Advanced Manufacturing*. May 08, 2017. <http://advancedmanufacturing.org/12070-2/>.

"What is IIoT? The Industrial Internet of Things." *Inductive Automation*. <https://inductiveautomation.com/resources/article/what-is-iiot>.

Welander, Peter. "IT vs. OT: Bridging the divide." *Control Engineering*. August 16, 2013. <https://www.controleng.com/articles/it-vs-ot-bridging-the-divide/>.

Williams, Martyn. "The Benefits and Challenges of IT/OT Convergence: Rewriting the rules." *Automation.com*. September 14, 2016. <https://www.automation.com/en-us/articles/2016-2/the-benefits-and-challenges-of-itot-convergence-re>.



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