SMART MANUFACTURING:

A new era of controlled production that's transforming the factory floor

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SMART MANUFACTURING:

FACTORIES HAVE BEEN UTILIZING AUTOMATION TO SOME DEGREE FOR DECADES.

But these systems are traditionally limited to performing single, discrete tasks or at best acting as isolated work cells. It is common for machines to make linear automation 'decisions' such as switching on a conveyor based on pre-set rules.

But the story is changing for the better with the emergence of the cloud and the IoT (Internet of Things) that has given birth to **SMART MANUFACTURING.**

WHAT IS SMART MANUFACTURING, AND HOW CAN FACTORIES BENEFIT FROM IT?

According to Deloitte University Press, **Smart Manufacturing is an application or system that uses intelligence to integrate business processes and physical machines. That means modern automation includes complex optimization decisions that humans typically make.**

In other words, smart manufacturing is founded upon the addition of advanced technology to your shop floor. It involves outcomes such as digitalizing all of your paperwork and connecting machines with the right people, skills, and activities.

A publication from the University of Wollongong (UOW) had this to say:

> Smart manufacturing is an evolution that focuses on boosting tighter connections between cyber and physical capabilities to leverage the power of big data and analytics.

Traditionally, your operators have to manually transcribe data, feed a bunch of inputs into Excel then take hours compiling data into a report.

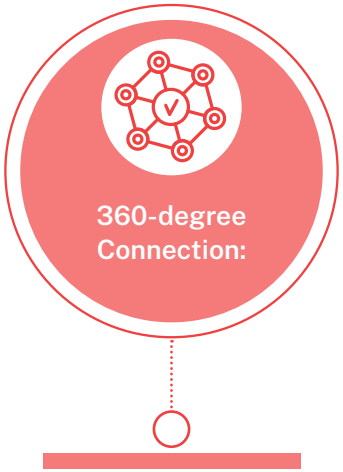
Management including supervisors will then analyze the human-generated reports and act which can represent a significant delay.

With **smart manufacturing,** you are instantly notified of issues as they happen without wasted time or effort. As a result, your decision-making becomes seamless and timely, leading to robust improvements in processes and products.

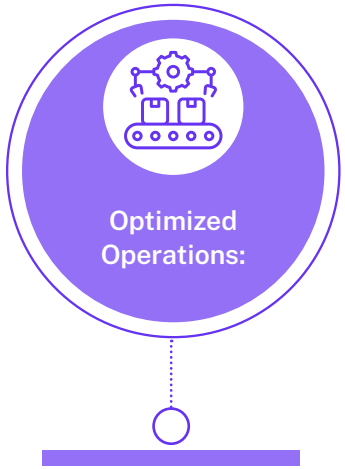
As an example, before starting a new production run, it's sensible to check whether the machine is clean and ready for work. An operator will typically conduct relevant checks and fill in a paper form to ascertain that everything is okay.

Digitalized checks remove the manual processes, streamlining communication between people and equipment which leads to more robust and transparent accountability.

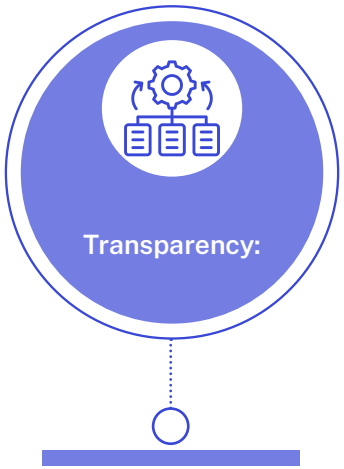
SO, HERE ARE SOME OF THE BENEFITS TO EXPECT FROM SWITCHING TO SMART AND DIGITAL MANUFACTURING:



- Continuously integrate traditional datasets along with new sensor and location-based datasets.
- View real-time data - enabling collaboration with suppliers and customers.
- Collaborate across departments (such as feedback from production to product development and maintenance).



- Enable reliable, predictable production capacity.
- Increase asset uptime and production efficiency.
- Automate production and material handling with minimal human interaction.
- Minimize cost of quality and production.



- Live metrics and tools to support quick and consistent decision making.
- Real-time linkage to customer's demand forecasts.
- Transparent customer order tracking.

- Predictive anomaly identification and resolution.
- Real-time safety monitoring.
- Early identification of supplier quality issues.

- Flexible, live and adaptable scheduling and changeovers.
- Implementation of product changes to see the impact in real-time.

WHAT ARE THE CRITICAL ENABLERS OF SMART MANUFACTURING?

Historically, large enterprises who could afford manufacturing execution systems needed to build them from the ground up using code. Modern IoT and cloud technologies, like TilliT, take this pain away. Companies can now get smart technologies off the shelf and truly digitalize their operations themselves, without the need for consultants leveraging the skills and tribal knowledge residing in their own team.

> IoT and cloud came through for us when developing a single solution that deploys smart manufacturing capabilities to several small and medium companies. So, expect TilliT to be affordable, faster, lighter, and easier to use.

HOW DOES SMART MANUFACTURING SOLVE OVERALL REAL-TIME VISIBILITY?

Compared to other MES, IIoT and OEE solutions, TilliT Smart manufacturing platform does more than just relay your machine's performance and conditions, it allows you to get in-depth insights into your total operational performance in real-time. You get to know how both people and equipment are executing orders, checking quality, and maintaining systems. With this knowledge, it becomes easier to control work balance, cut down time-wasting processes, merge activities where possible and solve issues.

So, how can smart technology tackle your real-time visibility needs?

The answer lies in lightweight IoT integration and synchronization of processes, people, equipment, and materials into a digital workflow. This connectivity gives a true view of your business beyond your machines' uptime, downtime and subsequent availability. You can see your people's performance at the workplace, assign the right activities to the right skills, and ensure everything is in equilibrium.

HOW DOES SMART MANUFACTURING HELP TO SOLVE QUALITY AND OPERATIONS MANAGEMENT?

When asked to improve quality and operations management, many companies still rely on outdated methods like following standard operating procedures on paper.

Typically we see the following: Operators carry out tasks, take crucial measurements, write them down on a piece of paper, and check performance against standard set of values. Before the supervisor checks the reports and acts, it might be too late.

When it comes to quality management, checks, analysis, decisions and changes need to occur at the right time. Delays here can cause recalls and rework translates to lost hours, extended downtimes, lost revenue, and a damaged image.

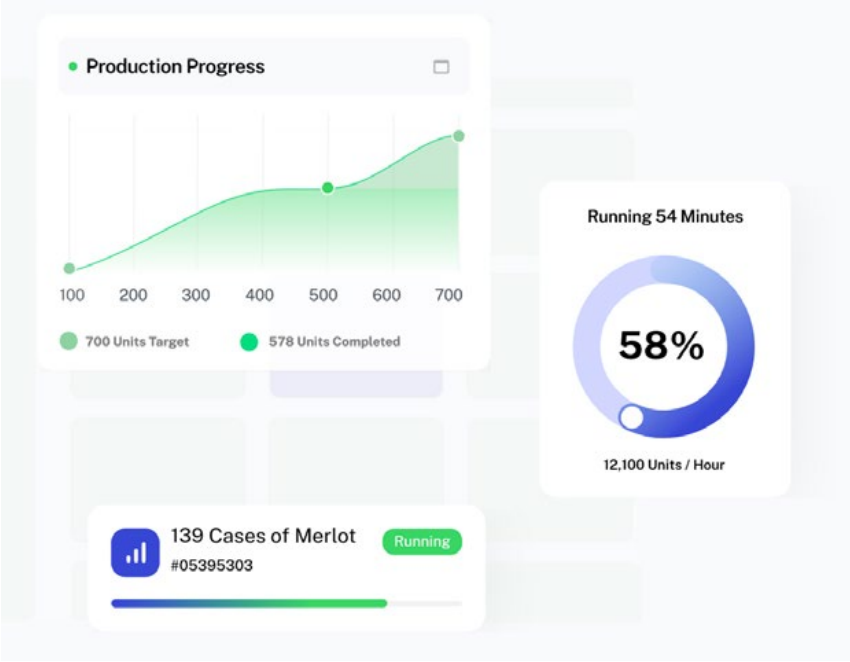
Smart manufacturing enables us to digitalize the scheduling, production, quality and maintenance management processes. It casts the paper processes aside and introduces a digital platform that promotes real-time feedback, efficient task execution, and accurate digital records. Modern sensors can sniff out an issue and alert the appropriate person (or persons) quickly for them to take immediate action.

WHAT DOES IT MEAN TO HAVE DIGITAL MANUFACTURING OPERATIONS?

It simply means you're integrating what happens at the machines or on the line with what people need to do at the right time.

This gives managers and supervisors more comprehensive end-to-end visibility into the whole factory.

Managers now know the activities on the shop floor, expired processes, and jobs that didn't go within specified requirements. You also get real-time insights to help you direct the operators in implementing work instructions. With this capability, it's easy to tackle the operational pain points that factories contend with daily.



What skills will the factory manager need to implement digital manufacturing operations?

Here is where advanced manufacturing systems and platforms like TilliT become more exciting.

TilliT was built with the manufacturing environment as a backdrop and with simplicity and user friendliness at its core so that non-technical people can self-serve and set up the system independently.

This means replicating existing factory processes doesn't require any additional skills to the people you already have. You can successfully deploy a fully digital manufacturing operations suite without the need to engage the services of **consultants, delay onboarding or add additional expense.**

Once you receive the TilliT IIoT sensors and Edge devices, connecting them to existing OEM, SCADA or PLC systems is a breeze. After taking things to the cloud, rich video and tutorials will guide the end-users in your organization through the entire process. The icing on the cake is that TilliT platform doesn't have a steep learning curve. So, expect the system to be up and running in hours to days and evolve it as you become familiar with the power of the platform.

HOW DO DIGITAL MANUFACTURING OPERATIONS IMPROVE CONTROL FOR THE FACTORY MANAGER?

Sure, companies have been benefiting from the integration of digital technologies with manufacturing equipment. But to reap the maximum benefits available in a complex environment, you need to fully control everything. It's time to bring the whole factory onboard instead of being asset-centric. That way, managers can control operations, people, machines, and other required inputs.

Smart and integrated systems ensure everything's running seamlessly like a well-oiled machine. You enjoy 360-degree visibility into machine performance, bottlenecks, and inefficiencies in the operation. The data gained from this is useful in making swift changes to skyrocket yield and cut down on waste. If the factory can rely on this data to schedule maintenance, reduce lead times, improve throughput and more, then this can literally drive production in a smart factory.

> The more quality data is collected and utilized, the more efficient the processes.

HOW DO DIGITAL MANUFACTURING OPERATIONS IMPROVE THE PRODUCTIVITY OF FACTORY WORKERS?

Digital manufacturing operations is a game-changer for productivity in today's world of manufacturing. It connects people with the right skills to the right task at the right time so your workforce no longer has to fumble and try to remember every single detail about what to do, when.

The absence of digital manufacturing operations means your workers have to know how, when and where to execute every activity and then transcribe complex data onto paper. Someone else then needs to recheck or enter the details into a spreadsheet or static database. Digitalization of these painful routines allows the operator to capture data at the press of a button, take a picture of an issue or scan a barcode to ensure accuracy.

Your workforce no longer has to decode complex forms printed on A4 or A3 paper, knowing what to fill out when writing things down to be checked off, before moving on to the next task. So, their motivation and productivity increases exponentially. They can focus on what makes a real difference to efficiency, rather than getting bogged down in menial tasks.

> In one case, our TilliT system allowed the client to save 60 hours per week by converting a paper-driven process into a much more efficient digital version.

WHAT ARE THE MOST POPULAR USE CASES FOR DIGITAL MANUFACTURING OPERATIONS?

A visit to most factories will reveal one thing: almost 90% of them still rely on paper forms in their quality check stations. The operators have to fill in the form using a pencil and let the managers ascertain that machines, materials, people, and other assets are in the right positions before firing off the operations.

This way of doing things is prone to costly human errors and time wastage between shifts. A simple mistake like illegible handwriting or a missing figure is enough to cause tremendous loss.

With a digital manufacturing system, you're able to highlight any issue immediately, allowing you to act swiftly. You no longer have to rely on the operators' capability to understand the priority of an issue. Taking timely actions is now possible-there's no more waiting for them to escalate issues through the sluggish papers and spreadsheets.

Smart manufacturing also means you can validate your finished products against a specification. You want those net weights or fill volumes to be within the acceptable range before dispatching. If there's mathematics and calculations that need to be done, you can save yourself from the cost of miscalculations that come with human errors. That means your data quality improves, enabling more accurate decision-making.

Another common use case relates to tracking lot sizes and products to ensure your workers or suppliers pack the right products and quantity. You can easily scan the labels to ensure they're the right ones for that Order or Batch. So, this modern system brings traceability into your operations, and it's easier to discover which of your suppliers are best when it comes to quantity, or which customers to contact to let them know there has been an issue

WHAT HAVE BEEN THE TYPICAL PROBLEMS WITH SMART MANUFACTURING TECH TO DATE?

Smart manufacturing has been around for several years now. But traditionally, companies have to build them from the ground up using their in-house IT team or outsourcing the task. And you know what this means? Your company needs enough financial muscle to hire top-notch specialists.

Also, the engineers need to spend time writing code and stitching together several modules, usually from different vendors to achieve a smart manufacturing environment. So, employees have to contend with a complex system consisting of parts that are loosely integrated at best.

With modern digital manufacturing enabled by TilliT, you don't need to be a tech guru or a coding master. You can deploy everything yourself in a few simple steps. The fact that you're accessing TilliT from the cloud means the solution can also scale with your organization and is ready on day 1.

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Cloud solution partners like AWS allow you to add more resources and handle more data at lower prices than traditional systems. So, it's time to replace those modules, paper, manual processes, spreadsheets, and other traditional technologies to embrace a single source of truth.

WHAT ARE YOUR FUTURE PREDICTIONS FOR SMART MANUFACTURING TECHNOLOGY?

At TilliT, we predict that smart manufacturing will take centre-stage for scheduling and executing operations, maintenance and quality management in 95% of manufacturers worldwide. Companies that have been relying on traditional approaches will embrace digital operations management to become modern, efficient factories.

But first things first-for any factory to get future-ready, it needs to take care of the fundamental aspects and industry standards that will form the foundation for future operations.

The key foundational rock is a data system that collects data in real-time and ensures it is clean, valid, and available. This gives modern technologies (like artificial intelligence and predictive algorithms) a fertile ground to help you solve any complex pain points in your organization.

WRAP-UP

Are you searching for a smart manufacturing solution that will take your factory to the next level?

TilliT makes it easier to digitalize your production schedules, paper-based processes, activity logs and data collection, into a digital workflow. This digital manufacturing platform is budget-friendly and enables you to see benefits immediately. That means no more wading through mountains of paperwork trying to put the pieces together!

If you're ready to embrace smart manufacturing technology, **contact us** for more information, or to discuss a demonstration of TilliT.

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