



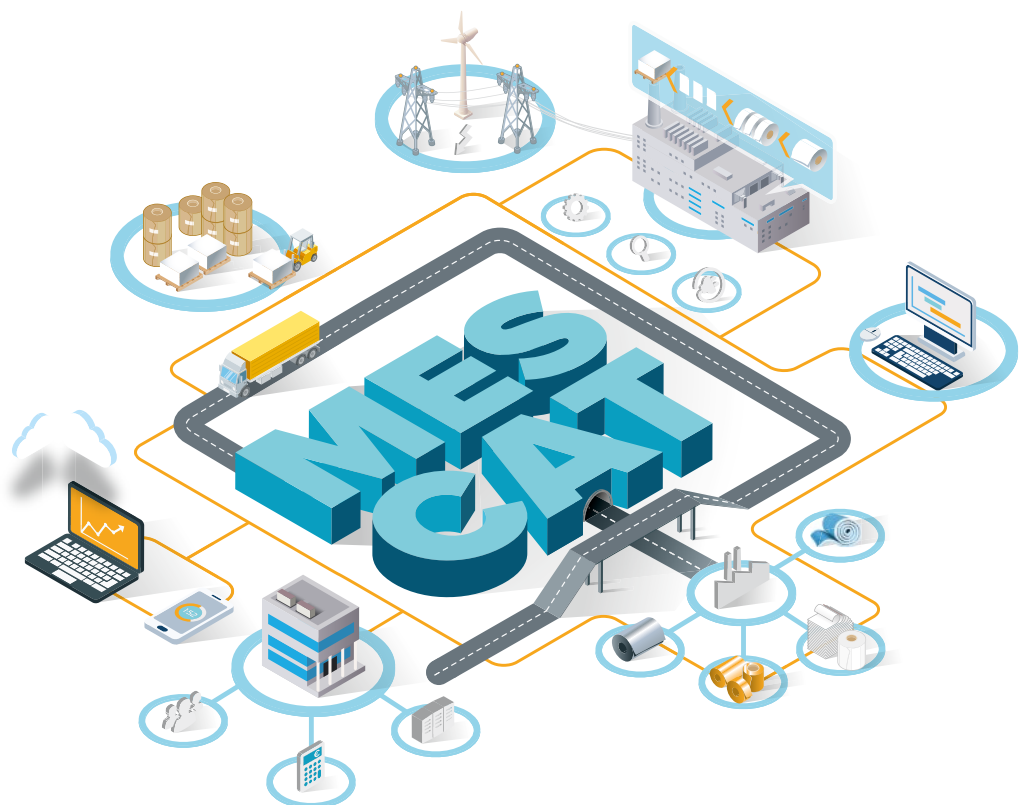
10 TIPS FOR YOUR MES IMPLEMENTATION

A manufacturing execution system (MES) is an important element of the digital transformation. It is used for managing, monitoring and controlling production in real time. This whitepaper sets out concrete tips for ensuring that your MES project has a successful outcome.

In many companies, production is only partially digitalized (or not at all) and there is no clear picture of what's happening where on the shop floor: whether the items that have been produced match the plans, and what the production setup was (e.g., in terms of quality and resources).

machinery and plants.

However, installing an MES is a major project and not without costs in terms of time, money and resources. To help you make your MES project truly transformational, rather than throwing money down the drain, we have put together a collection of concrete tips. Some of them may sound obvious, but be aware they can make all the difference between a successful project and one that never gets off the ground. This whitepaper represents the distilled knowledge accumulated through dozens of MES projects and fifteen years of experience with our own MES tool, MES CAT, developed here in-house.



Think carefully about requirements and objectives

TIP #1



Improve quality, increase output, reduce waste, optimize maintenance... a manufacturing execution system (MES) can do much more than just log production orders. The very first questions to answer are: what exactly will the new system do in your business, and why does installing a new system make sense? You need to look closely at exactly what benefits can be achieved when you transform a black-box production into a transparent system by implementing an MES: what are your use cases? How will you use the data and analyses that it offers? Every company and indeed every plant will have slightly different answers. One thing is constant, however: every MES is different.

The core tasks of an MES include recording machine and plant data. Our client Greiner Packaging uses MES CAT to process up to 10,000 items of sensor data from the integrated machines every minute and handles millions of HTTP requests daily. However, a powerful MES doesn't just log times and part quantities at machines; it also records factors such as wastage, downtimes and maintenance information.

On the temporal axis, information must be collected in dense series, not just every hour or so. A very granular recording is essential, so that production managers can accurately trace or prevent faults, identify weak points and eliminate problem causes.

WHAT ARE THE PROBLEMS THAT THE MES WILL SOLVE?

Key features of an MES include the ability to analyze and evaluate data as well as logging it, control center functionality, detailed planning, and quality data management. The system also monitors tracking information for batches and products, and can be used for real-time

services such as managing energy consumption.

Take the time to define exactly what your requirements are for the new digital solution in production. What use cases promise efficiency improvements? Which workflows do you want to support with digital systems? Do you just want to monitor whether production orders have been logged correctly – or perhaps you'd also like to support your personnel with guided processes and manuals? Examples of functionality that our clients are looking for from a modern MES include:

- System-supported, standardized logging of production and process data
- System-supported detailed planning for production managers
- Accurate resource management at production order level (machine operation, materials, personnel)
- Optimized scheduling for production orders, taking into account factors such as resource consumption and delivery dates
- The ability to implement automatic preventive maintenance processes
- Seamless traceability for individual batches
- Centralized quality control or energy management
- Support for preparing complex audits

Think carefully about which functions you need and check that suitable MES modules are included in the solution you choose: don't settle for simply installing a system for logging streams of data from machines or plants when you really need more comprehensive functionality.

A simple data acquisition system is sometimes mistakenly believed to be an MES.

PRICE ISN'T EVERYTHING

These simpler systems often come with an attractive price tag. However, the chances are that later on you will want to add in extra functionality – functionality that would have been included in an MES module, such as maintenance, quality data, or storage and logistics. Integrating this into your data acquisition system can be costly.

Particularly if you've opted for a third-party system, you may have to grapple with additional interfaces – possibly error-prone or complex to develop for – or new UIs that your personnel struggle to learn their way around.

All in all, it makes sense to start from a flexible, modular MES that already includes all the components you need for your production management. Your system can be extended as your requirements change,

and you will not find yourself forced to develop isolated solutions and additional interfaces. Also, the solution will use a single integrated database, keeping your processes stable and high-performance.

Another thing you need to establish early on is whether your MES will be an on-premise solution, and if so, whether it will be centralized, distributed across individual plants, operated in the cloud, or perhaps a mix of a centralized system with individual cloud-based modules. If the MES is implemented on a dedicated server in each production location, the machines can operate 24/7. When the centralized ERP system is shut down to update to a new release or for maintenance work, your MES system continues to collect data, which is temporarily buffered. As soon as the ERP system comes back online, the applications and data are automatically synchronized.



Workshops to establish clarity and a proof of concept

TIP #2



Digitalization is an all-encompassing theme and the only way to guarantee success as you bring your production online is to keep your eyes on the big picture and take one step at a time. An MES is a powerful tool with huge potential and capable of supporting a wide range of use cases. But don't let the complexity overwhelm your project.

Every organization will have a sweet spot between exploiting as much potential as possible, and getting bogged down in the maze of possibilities: you need to find yours. But where should you start? We have found that frequently, the best way to begin is to hold a workshop with an MES software provider.

A key factor for the success of your MES project is that you have an accurate picture of the improvements that you expect the project to deliver. It's essential to pin down exactly what your expectations are and which processes will need to be optimized to achieve them.

A SPECIFICATION IS A GOOD BASIS

If the company already has a project team that has worked on selecting an MES provider, there is sure to be a detailed specification ready to go. The document will set out clearly what functionality is required, which plants the system will network, and which interfaces you will need to implement. In this case, the time to hold the workshop with the chosen implementation partner is at the end of the selection process. You will have received presentations from the providers, followed up their references, etc., and made a decision about which partner to go with.

One of the key purposes of the workshop

is to cement this decision, as it will be a time when your chosen provider can prove their expertise and impress you with creative solution approaches to your complex problems. You will get a good feel for both the competence and the person-to-person interaction with the technical team – after all, until this point, most of the contact will probably have been with their sales team.

AN MES PROVIDER WILL SUPPORT YOU

Not every company already has their specification ready and waiting, particularly if this is your first MES project. Often, you have a list of objectives, but haven't yet drawn up a detailed specification. Don't make this a reason to postpone your MES project. A workshop with an MES provider can be very helpful at this stage to clarify your requirements and turn them into a precise specification.

Make the most of the project experience and technical expertise that the MES provider can offer! Companies such as T.CON and other MES providers have been part of numerous successful MES projects. They can make valuable contributions as you transform your objectives – which may be no more than ideas sketched on a sheet of A4 – into a concrete specifications document.

SELECTING THE CREAM OF THE CROP

A workshop not only establishes clarity. It is an opportunity for intensive interaction with the people you will be working with and helps establish the necessary trust between the project partners. Note also that if you are planning a very large project, it's not uncommon to hold workshops with two different providers.



At this stage, don't let the scope get over-ambitious. An MES has a vast range of options for functionality and exploitation potential, but you can't expect to use everything right from the start. You need to walk before you can run. The workshop should cover the functional scope of the planned rollout. We have found that it doesn't usually pay off to attempt to pin down details at this stage of how the functionality might be extended later on: our experience is that as the rollout progresses, requirements will change anyway. Below, we'll go into more detail about taking an agile approach to your MES project and how you can use this approach to respond flexibly to changes and new requirements as the project progresses.

What if you realize during the workshop that the provider is not the right choice for your organization? In our experience, this is very rare. However, even if it happens, you won't have wasted your money. Your project team will have a better understand-

ing of which project details are important, and you will also have the output from the workshop (e.g., the specifications document) that you can bring to the next stage of the project. This will save you a lot of time as you move to a new pilot project with another provider.

THE BENEFITS OF A PROOF OF CONCEPT

If you want to be certain that the MES you are considering really will meet your requirements, a proof of concept (PoC) may be the answer. A preliminary analysis with a proof of concept is admittedly more resource-intensive than a workshop; on the other hand, the results are more definite. The first step is to compile a fit/gap analysis. The purpose of this is to establish how well the MES offered by the provider fits the client requirements. If the analysis identifies gaps – that is, processes or procedures that are not covered by the MES functionality – these are set out in a specification and evaluated.

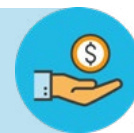
This was the approach we took with one of our clients, a major paper and pulp producer. Our T.CON production experts sat down with the client's team to establish whether T.CON's tool MES CAT was a good fit for the task of supporting the processes involved in paper and pulp production at a new plant the client was opening. This fit/gap analysis convinced the client that our MES was indeed the best solution for their production facility, and the decision was taken to use it for the rollout.

The next step was the preliminary work and testing for the proof of concept. During this stage, development teams put together prototypes to demonstrate the

feasibility of key functions or characteristics. Building a PoC is a little different from simply developing a prototype: the system typically includes implementing large blocks of functionality and preliminary design work, often involving a range of stakeholders. The goal is to demonstrate that some key aspect of the product will be viable. That's not just important for the project team themselves. It offers assurance about the project to internal stakeholders, especially those with a financial interest in the project. You demonstrate that the planned solution can actually be built and will meet the needs of productive operation.

Keep in mind future integration and the risks of technical lock-in

TIP #3



MES providers use a range of technologies for the solutions they develop. The underlying technology doesn't need to come into direct consideration when you're looking at the scope and performance of the systems. Nonetheless, you need to remember that an MES is not just a production management tool: it also needs to interact with other IT systems.

Typically, your company ERP system will be home to all kinds of processes associated with production: order receipt, material management, production planning, logistics, etc. And very often, this ERP is an SAP system. If so, it makes sense when you're comparing MES solutions to clarify just how easy it will be to integrate a particular MES with your SAP tools. Indeed, even if you are using a non-SAP based ERP, a CRM or some other enterprise software, the same thing applies: always investigate what work and resources will be involved to make the MES interact with other systems.

THE COSTS OF INTERFACING BETWEEN TOOLS

If the MES can be seamlessly integrated into SAP, you will save resources by eliminating the need for redundant data management and all the disadvantages that brings. Plus, you will not need to develop and maintain your own information exchange interfaces, so you will save time and money. There's no duplication of master data. Plus, once your MES system has been integrated into SAP, you will be able to draw on your in-house SAP expertise for future adaptations and extensions to meet specific process requirements – once again, saving on IT costs.

These aren't the only benefits of having an MES integrated into your ERP system and seamless data exchange. One of our clients, specialist paper manufacturer delfortgroup, uses T.CON's MES CAT for continuous transmission of data and KPIs to SAP ERP; on average, 1400 post-logging records are logged every day. The

ERP system processes them immediately and transmits the records, along with other operating data, to an SAP Business Warehouse for evaluation. In the other direction, approved SAP production orders, cutting plans and knife settings are sent instantly to the MES software, and are directly accessible in production.

This integration is exactly what makes it possible to implement a wide variety of use cases effectively. Another example: the Koehler Paper Group can exploit optimization potential for, say, thermal paper, thanks to the fact that MES CAT is seamlessly integrated into the SAP APO components for production planning and detailed planning (PP/DS).

INTEGRATED SYSTEMS CREATE POTENTIAL

Integration typically opens up an array of new potential for making production more cost-effective and efficient. The detailed reports in the SAP system give machine operators, production managers and the company management an accurate, granular overview of production costs. Energy consumption, personnel costs, downtimes, setup times, quality characteristics, repair and maintenance costs are all set out transparently and can be compared with numerous other cost factors. The results can be read off not just in units such as kilograms of defects, but also directly in terms of cold hard cash – dollars and cents. That means

you can directly assess how different optimizations will affect your figures, and leverage the right potential.

Reviewing the underlying technology of an MES is not just relevant when thinking about integration. It's also an important factor in ongoing maintenance and development costs. If the MES is based on a proprietary solution or virtually obsolete development environment with very few experts, you may run into problems later on. As an example: many banks today depend on systems built with COBOL – and COBOL developers are a dying breed. The banks find themselves competing at extortionate costs for experts who can keep their vital core systems operating. It therefore makes sense to choose an MES built on a development environment that already has a broad user base, a large pool of experts and strong support base. That way, you can be sure that there will be experts able to work with the system well into the future.

Finally, you should consider how extensible the MES is, when it's time to add new functionality. An idea dreamed up tomorrow that turns out to be important might not be part of the feature stack at present. Will it be possible to add a new software suite or other components (from the cloud, say) to your core MES? If so, you can be confident that you will be able to extend the system to meet new business requirements, even in fast-moving circumstances.

Launch pilot projects

TIP #4



The workshop is complete. You have a clear list of requirements. It's time to get the project moving and bring the people who will be using it on board. Non-technical users often think of getting to grips with new software as a frustrating task that takes time away from their "real" work without much payoff.

You want to counter this attitude by demonstrating the payoff – the benefits and possibilities of the new software – early on in the project. Your users need to understand from the start how they can use the tools to improve their daily routines. This works best if you focus on areas where the benefits and return on investment can be achieved most quickly, or where the tools are most badly needed.

Often the first step after project launch is to commission a pilot install on a few machines. This gives your users an opportunity to work with the system in practice from an early stage. New aspects may arise during this phase and the specifications

will need to be updated accordingly. Successful commission of the pilot will usually be followed by the commission for the rollout.

The pilot is intended to cement your decision for the rollout. It makes sense to define the scope of the pilot so that users can immediately see the practical added value of the MES, but on a scale that can be implemented with reasonable outlay.

FOCUS ON THE DAILY USERS

From management's point of view, the MES will bring numerous benefits such as quality improvements, tamper-proof production information, etc. But what about the people who will be using the system every day? That's your production managers, shift leaders, machine operators, etc. In the projects that we have been involved in, we have found that these users often expect to see productivity improvements directly at the machines. This is another good reason for launching a pilot project.



We find that many companies are lacking concrete information about exactly how productive their machines are. They may well think they have a good idea, but without accurate measurements, decisions are made based on gut feeling and unsubstantiated beliefs.

Data-driven decision-making is usually a better foundation for subsequent improvements. It's therefore often sensible to begin your project with a data-gathering phase. Set up machine data acquisition (MDA) on two or three machines and identify the hidden optimization potential.

LEARN FROM THE PILOTS

Following successful completion of your pilot projects, step back to evaluate the results, so that you can optimize the next stage – networking additional plants. This is followed by the rollout on new machines.

We know from experience that this stage takes some time. Even a simple MDA system cannot be installed in a couple of days. We have found that it is worthwhile to set aside two to four months for this stage.

You can use the data to start introducing initial optimizations straight away. In other words, you are launching a continuous improvement process (CIP) for your production department. It's common to use OEE (overall equipment efficiency) as your KPI.

Depending on your business and where you are starting from, it may make sense to set up additional pilots to establish exactly where your MES will bring added value. You can firm up the focuses of your pilots during the workshop. The key here is to come up with something that can be implemented quickly.

Proactive communication with stakeholders

TIP #5



There is no comparison between a costly, all-encompassing SAP install and setting up an MES. However, even the MES project will trigger a lot of changes – certainly in production. We have learned that it's important to focus on transparency and get your stakeholders involved at an early stage.

Inform everyone who will be affected by the project about your plans, right from the start and in detail. You need everyone on board: from the production managers to the IT department; from the machine operators to the works council. This is the only way to ensure that your project can reach its objectives successfully.

Make sure that everyone knows about the plans to install an MES and what that will mean for each individual. That way, you can clear up concerns and fears early on and make sure everyone is pulling together towards the project goals. It's the only way to guarantee that the project stays on schedule and meets its objectives.

INFORM THE WORKS COUNCIL AND OTHER PEOPLE AFFECTED

Informing all stakeholders means informing the works council. Indeed, if the MES is being used to record personal data, this needs to be regulated in the labor contract. It's not just a legal requirement: it makes sense in any case to involve your labor representatives in the project from an early stage.

The works council understands the concerns and fears expressed by your personnel, knows what has already been discussed and agreed about data protection in your organization, and will have been involved in the plans for previous data solutions. The works council is therefore in a position to provide invaluable support during the installation project and clear up any concerns that your personnel may have.

The MES will have to perform tasks such as automatically logging machine data or transmitting collected plant data. The data is core to achieving efficiency improvements and reducing workloads. The task of the works council will be to assure your workers that the MES is not a monitoring instrument for individuals; that it really is there to ease their work, perhaps by automatically presenting instructions or reducing the need for manual documentation; and that their jobs will become more secure, not less, when the company can boost productivity using an MES.

Making sure to involve the works council at an early stage ensures the council and the labor force are on board and reduces the risk of a negative response at a later stage. Getting the council motivated about the project will give you valuable allies as you communicate the changes through the organization. In the best case scenario, the labor representatives will even act as reference contacts for other works councils.

It's also important to involve other participants in planning from an early stage, even when you are not legally required to. For example, make sure to bring in key knowledge holders who can contribute a well of practical experience, such as machine operators and shift leaders. These users know exactly how processes are understood in practice and can put their fingers directly on the strengths and weaknesses. This practical knowledge is invaluable when you are developing an MES solution. It's usually well worthwhile to involve people with this kind of know-how in your sessions early on, and ask machine operators or shift leaders to test solutions for their real-world usability.

Nonetheless, you do need to tread carefully. The solutions you present should be well-rounded and have reached a certain stage of maturity. Don't put off your users with half-finished interfaces or abstract concepts that they can't work with. Presenting machine operators with an immature prototype can result in you losing the trust of important stakeholders. Ideally, you will assign Key Users – we'll talk more about these later – and train them in the software; they will then in turn train their peers in its day-to-day use. Your Key Users are the link between IT logic and project structure on the one side, and the day-to-day reality in production on the other.

Find the right project model and team

TIP #6



Installing your new MES will demand skills and time. Your service provider can't work in a void: your personnel will need to be actively engaged. This means that it's important to define a project methodology that will ensure a stable project flow, while remaining agile and allow yourself flexibility to react to unexpected events or changing requirements. If an MES project is to reach a successful conclusion, a tried and tested methodology is essential.

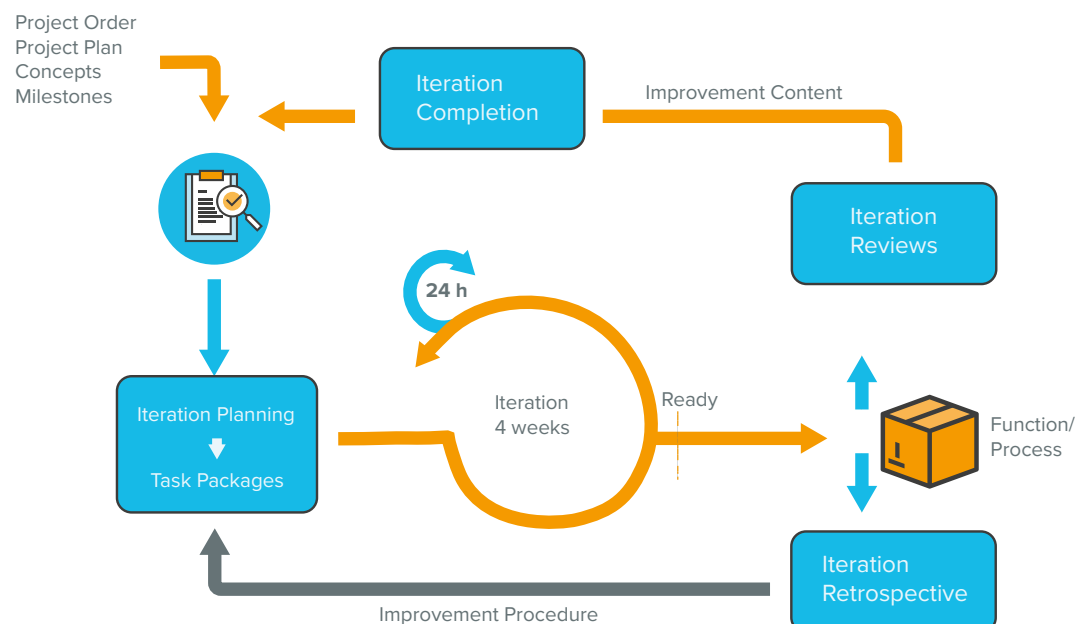
Another condition for success: your internal project team should be made up of experts from across your departments. Ideally, the same team will have worked together to develop the specifications document during the provider selection stage. It will now be responsible for ensuring that each task in the project plan is completed in its turn, deadlines are met, and regular meetings keep stakeholders informed about project progress. Coordinating a project of this kind is not usually a full-time job, but you do need to make sure

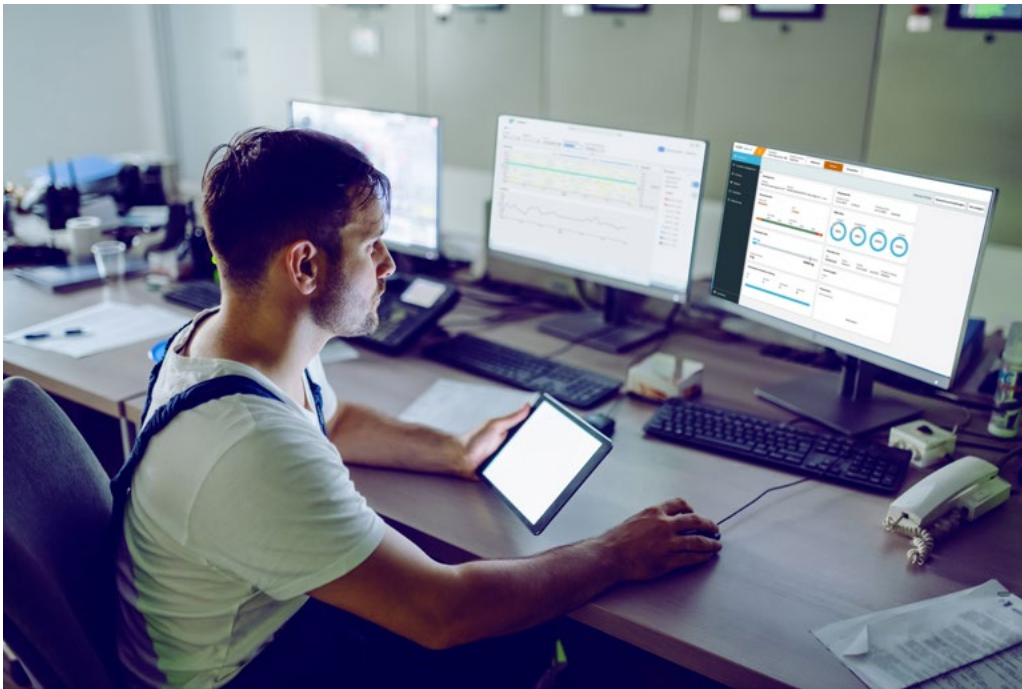
that everyone is allocating the time they need to fulfill their role in their project.

Sometimes, when we're partnered with a company, we find the person assigned as the company's MES project leader is not allocating sufficient time for planning and implementation. As a result, the MES project suffers from delays and setbacks, destroying motivation and commitment to the project, and ultimately leading to the collapse of the project.

KEY USERS ARE ESSENTIAL

The project team should select a number of Key Users to represent the end users of the system; these Key Users will be involved in defining system requirements and testing that the system delivers on its promises. They will receive intensive training in using the MES system. Once the system has been rolled out and accepted, they will support users in production and administration as they get to grips with the new system. They may in turn be supported by





the MES provider's helpline. It is your Key Users who will train new employees to use the system. They will also be able to configure parts of the MES and correct user errors.

You also need your company executives on board. If the board is not fully behind the project, it can never reach its objective. It's not enough for the executives to simply approve the resources and then delegate the work. The board needs to have the backs of the key project members at all times. They need to ensure that everyone is allocated adequate time to turn the project into a success and reach its milestones on schedule. The board also needs to be ready to step in as necessary if the goalposts move or objectives seem to be slipping.

T.CON has developed its own process model specially tuned for the requirements of enterprises, called TEAM.UP. TEAM.UP is scalable and can be used for different types of IT projects. Other consultancies have their own project methods, all slightly different in their details.

TEAM.UP draws on successful elements from tried-and-tested process models. It is based heavily on the ASAP Roadmap and Scrum. These bring agile working methods into the projects.

The main pillars of TEAM.UP are an iterative approach, analysis and modeling of client requirements with a focus on processes – which can be adapted at any time during the project without significant repercussions for budgeting, schedules, milestone plans, etc. This contrasts with the traditional waterfall model, in which project experts try and summarize every possible situation and dependency at the start of the project. They then use the analysis to derive exactly what will be done at each step. However, if something unforeseen occurs, new requirements arise or certain requirements are dispensed with, then the whole plan starts to falter.

KEEP DAILY BUSINESS IN FOCUS

Even when you are using an iterative model oriented towards the organization's requirements, it's still important to have a project schedule and establish deadlines and

roles early on. You also need to plan how resources will be deployed. The people you appoint to the project team as Key Users will usually keep doing their normal daily work. That means you need to establish how time will be carved out for the project: who will be doing what, when they will be doing it, and how the whole team can best prepare for their tasks.

You'll also be working closely with the IT department, who will be responsible for setting up the servers, operating systems and interfaces that you need. After all, seamless integration of the MES with your existing IT landscape is key to the success of the project. You may also need to coordinate with the electricians who will be responsible for installing the network infrastructure in your production plant, or with people who will obtain information from the machine manufacturer that you can use to fine-tune

how your software interacts with machine signals.

It's important to have a realistic project schedule with a sensible buffer for unexpected circumstances. After all, it's highly likely that something unexpected will crop up at some stage, whether during daily business or in the MES installation itself, and cause delays. We find that clients are often over-optimistic when estimating the amount of work involved and drawing up a project schedule. The overall result is that milestones are not reached on time, and subsequent steps can't be launched as planned. If other participants had blocked out particular dates to help with these steps, the repercussions can be extensive.

Your MES provider is there to help you estimate your resources realistically and plan appropriately. You should trust in their project experience, which has accumulated through numerous MES projects.

Think modular and establish appropriate interim objectives

TIP #7



Another one of our clients is Rapunzel Naturkost, producer of organic foods. Due to the diversity of the products made, the production department has a large number of different processes. The aim was to digitize this part of the value chain using an MES. The controlling department could then work with production data in their SAP system. Production flows would become more transparent and it would be possible to draw up cost analyses incorporating the whole production chain.

A further goal arose from the company's expansion: the project team was looking for a tool that could support workers

in the production department. The new digital tool was intended particularly for new employees, and would offer guided processes and digital manuals that would assist them even with the most complex workflows.

Rapunzel's project team took a step-by-step approach with a focus on early successes. They therefore opted to begin with a "lean MES" that would use only a fraction of MES CAT's functionality. Once the production systems had been networked, the MES initially just provided information about waste, times and no-fault messages in SAP ERP.

Additional MES components – such as quality management or detailed evaluation – were delayed to a subsequent project phase. On the other hand, the digital manuals for machine operators were launch-

ed directly with the start of the project. The new guided processes meant that even new, inexperienced employees could follow complex production processes without missing a step.



Home in on success with use cases

TIP #8



As an end-user company, it makes sense to select a suitable modular MES, and then choose system components to meet your requirements. These might be e.g. machine data acquisition, plant data acquisition, maintenance, quality data, storage and logistics, etc. The modular approach allows you to begin by focusing on the elements that will benefit most from optimization. You do not necessarily have to follow the logic of a particular service provider, who may be keen to implement their own feature.

Your employees can help to develop use cases at various points of the MES project

and experience the benefits of the system themselves.

Is it cheaper to produce a delivery using machine A or machine B? You can come up with a precise answer based on real order and invoicing data. You can easily spot points where costs explode – either because they are areas where rework is often required, or points where long set-up times result in costly downtime. Armed with this information, you can develop economically viable scheduling for orders and maintenance processes – contributing directly to the company's bottom line.

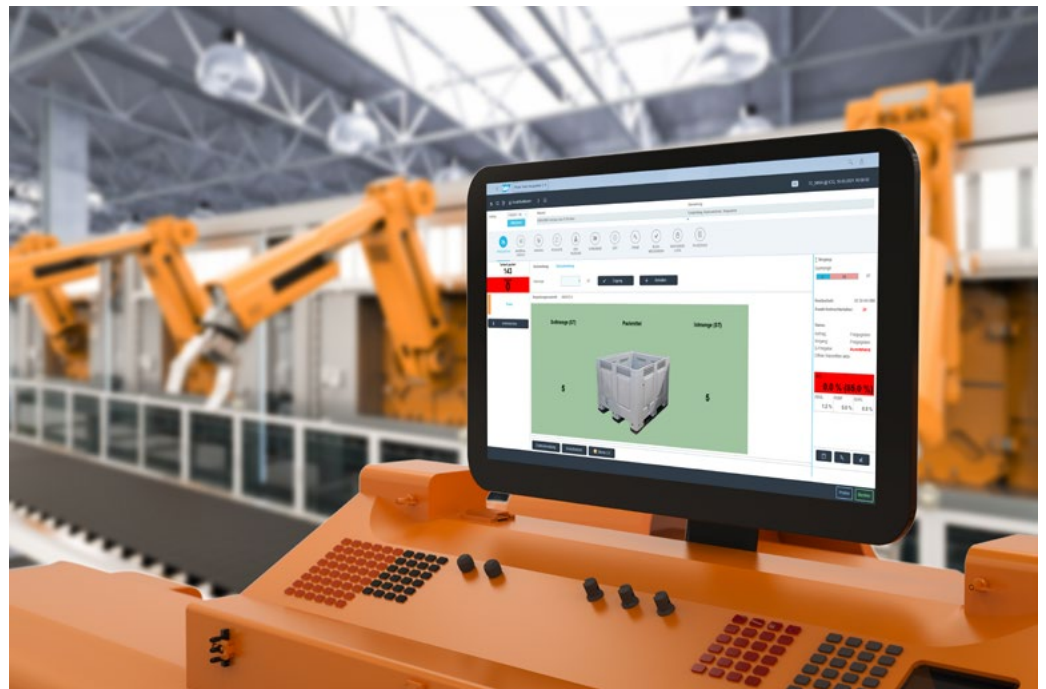
VALUABLE TIPS FOR PRODUCTION

You can also reduce waste, based on regular evaluations of the MES data. Is there one particular cause of waste that occurs more commonly? Does the waste typically occur at a particular point? If so, you can immediately see where the weak point is. In other cases, it can be helpful to analyze information covering all production events over a longer period of time. The MES gives production managers valuable insights into ways waste could be reduced.

One of T.CON's clients, for example, identified potential for optimizing and reducing costs during thermal paper reduction, by focusing on shortfalls, setup times and inventory. MES CAT allows production staff to modify cutting plans during on-

going production. The worker on the shop floor can simply press a button in MES CAT and generate a new cutting plan for paper rolls as production continues. The transaction is accessed directly from MES CAT and the output is sent to the working memory of the slitter. The software automatically takes into account open requirements and the inventory that has already been produced. Overall, orders can be processed more efficiently than previously.

When you implement results-oriented use cases, you give your employees the opportunity to gradually become more familiar with the MES and its possibilities. Once users have got to know the new system, are comfortable working in it, and have started to trust it, you can seamlessly integrate new modules and use cases. At this stage, everything usually goes smoothly.



Train and support your project team and users

TIP #9



At the start of the project phase, the project team should be supplied with complete operating manuals and documentation relating to using the MES.

Users are generally trained in the use of the MES at the client once the MES has been rolled out. It is best to give the training participants manuals and other training materials in advance, so that they can address concrete issues and questions during the training session. That way, individuals can home in on the parts of the system that are most relevant to them (e.g. OEE analyses).

Training should be limited to the MES modules that you have actually installed. There is no point in training users to work with (for instance) the quality data module during a test or pilot phase – after all, it will most likely only be relevant to a small circle of users, even if it is going to be installed later on.

Before the training session, the contents and outline for the session should be coordinated in detail with the client. Training should be tailored to meet the requirements of daily business as closely as possible.

Once the MES has been rolled out, make sure you allocate resources for maintaining the MES and providing user support. Just like any software, the MES will require maintenance; for example, updates when new versions are released. And just like any enterprise software, users will need individual support as they get to grips with using the MES.

SPECIALIST KNOWLEDGE IS ESSENTIAL

Maintaining an MES adapted to specific business requirements requires specialist knowledge. The same applies to user support. The support staff need to be able to respond quickly to users when problems arise, and understand how to get to the root of the problem – and this will require in-depth knowledge of the software.

Often, it's not viable for a company to develop suitable resources of this sort. That's why many companies decide to outsource operation and maintenance of their system to an expert partner – although they may still host the system on-premises. "We felt that it would make more sense to have external application management support, rather than trying to train personnel ourselves," explains the CEO of one of the companies who entrust their application and user support to T.CON. "That way, we can keep our focus on our core tasks." Those core tasks include, for example, strategic business planning. In the Managed Services model, the client must be familiar with the internal processes and interfaces, and able to derive requirements from these. They must also provide a contact person for the partnership. The Managed Services provider contributes all the necessary technical expertise.

Your MES provider or project partner for the MES installation will generally know of specialist IT providers who can offer these services – or indeed will offer them itself, as T.CON does.

Exploit the full potential of your MES

TIP #10



You've installed an MES. What next? What we often see is that the MES is used to organize production processes against the schedule and ensure a continuous production flow during execution.

However, a modern MES has much more potential than just monitoring production. It's a data hub that establishes a foundation for production to adapt continuously to new conditions – in other words, a continuous improvement process. The MES continuously collects information, ideally from all points in the production system. Of course, this information needs to be analyzed, and that's where the BI system comes in. It can examine all the events that have been recorded and identify patterns that are then analyzed by experts.

In practice, this means that the people in charge of production will be able to find new, hidden optimization potential. Were there delays somewhere? If so, you can investigate how they happened. Perhaps an unusual quantity of defects were produced during a particular shift. Why did that occur? Perhaps a machine failed – what happened? Was it operator error? Was a part not maintained properly?

You can use the system to look back and establish exactly how closely the people and machines involved in each production step kept to the rules. This means you can track down the causes of any exceptions. This is how the MES adds transparency to your order-to-cash process.

CREATING ADDED VALUE WITH THE MES AS A DATA HUB

The interaction between the information hub and the data from other sources – logistics, maintenance, servicing, etc. – forms a basis for continuous data analyses. These pinpoint areas in production with potential for creating added value. You can improve product quality or meet deadlines more reliably by continuously evaluating MES data and optimizing your planning based on this analysis.

An example: often, planning is based on outdated information. One company installed a particular plant a few years ago. According to the manufacturer information, this system stamps 60 beakers per minute. However, this value is only valid for small, very thin beakers. Now, however, much larger, thicker beakers are being produced, which also have a colored coating. It's no longer possible to stamp 60 a minute. Production tries to catch up the lost time by bringing in a second, less suitable, machine. The result: the quality of some batches is not up to scratch. The truck the company ordered ends up waiting on the loading ramp anyway, and delivery to the end customer is delayed.

By collecting data with an MES, you can manage much more fine-grained planning. The MES gives you up-to-date values straight from production – for example, the actual machine output. The planner can generate realistic estimates regarding

the performance that can be expected from the system. The next order will then be scheduled appropriately, the truck doesn't have to wait on the loading ramp, and delivery is on time.

By using data from the MES, it is possible to transparently identify which settings can be adjusted to increase production yields – without procuring new machines. At the end of our projects, clients often say something like: "We have found so many levers for boosting efficiency on our current ten machines that we're now producing as though we'd purchased an eleventh new machine!"

FOUNDATION FOR GREEN PRODUCTION

The MES can also be used as a basis for more sustainable, greener production, since it enables production with less waste; production that maximizes efficiency in terms of materials and resources. Efficient resource consumption means efficient energy consumption: a modern MES will provide information about the energy consumption of each machine.

This information can be built in right at the production planning stage. A transparent overview of all the machines enables you to see which ones are guzzling energy.

It may then be possible to plan orders so that energy-intensive machines only have to perform a small amount of the work.

Actual data from the MES can also help you to save electricity during production itself. An example from a packaging company: when the company produces small beakers, energy consumption is 37.5 kWh; for larger beakers, the plant uses 50 kWh. Given this data, it may not make sense to produce all the smallest beakers first, followed by the larger ones. By switching back and forth between products, the manufacturer can avoid creating peak loads when the energy consumption becomes much more expensive.

Your workers can also view the electricity consumption per production step, machine, or product. Since they can now make comparisons, they can be motivated to work competitively to develop ideas to save electricity – the gamification approach.



SUMMARY

An MES creates transparency in production and acts as a data hub, offering huge potential for analyses that can result in better planning and production. At the same time, it also acts as the basis of continuous improvement processes, allowing production to be steadily enhanced. Systems become more flexible and more resilient to failures or unexpected delivery bottlenecks. New products, recipes or procedures can be made profitable more quickly.

The first step of an effective MES project is to define suitable requirements and objectives, which are then analyzed for feasibility during workshops. By selecting an extensible, modular, easy-to-integrate software solution based on a future-proof technology, you are putting yourself on the pathway to success.

Take an approach using pilots to rapidly establish the benefits of the project; maintain proactive communication with all stakeholders; work with a suitable project methodology; and build carefully chosen teams for the launch project – and you are guaranteed to remain on this road!

You would like to know more?

Contact us!



Bradley Robb

International Business
Development Manager

T.CON GmbH & Co. KG
info@tcon-international.com

Headquarters
Straubinger Straße 2
D-94447 Plattling
Phone +49 (0)9931 981-100
Fax +49 (0)9931 981-199

© www.tcon-international.com

SAP and other SAP products and services mentioned in this text as well as their respective logos are trademarks or registered trademarks of SAP SE in Germany and other countries. All other names of products and services are trademarks of their respective companies. | 1210121210181