

Special Report

A 16-Point Checklist For Designing And Manufacturing Effective Automated Machines

By Mike Evans



Total Peace Of Mind

Dear Colleague,

It's so easy to fall into a number of traps when organising and running engineering projects, and designing and manufacturing effective automated machines are no different.

That's why I've written this short report to provide a 'heads-up' on the typical issues that can arise at the different stages of a project. Any of the issues I've identified will have a big knock-on effect on your project, and if not quickly addressed these pitfalls can make the difference between excellent ROI for your machine, or one which is a constant drain on resources, and an ongoing source of frustration and inefficiency.

This report has been divided into four sections which reflect the different stages of a typical automated machines project. The key point is that the efficiency and performance of any machine that is finally installed and working will be directly impacted by the points raised in each of these four stages.

I hope you enjoy this report - and I'd be delighted to receive your feed-back and comments, and hear about your own experiences.

Yours faithfully,



Mike Evans
Managing Director
EBS Automation

1) SALES PROCESS

1.1 One of the key issues is that you need your potential supplier to take **a practical view regarding the difficulty of the project** - if they are in need of work then they are more likely to take a job that is on the edge of their capabilities. So you need to be 100% certain that your supplier has the necessary capability; don't just accept their word for that, but ask for references and proof that they are more than capable of handling your project.

On the other hand, customers can sometimes be guilty of pushing suppliers beyond their natural capabilities, or ignoring the advice given by the supplier during the sales process. For example, sometimes suppliers can be persuaded by the customer to follow a certain route to save time or costs, and this can come back to haunt the customer.

I remember a case in point where we told our customer that they really needed a three station machine to reach their objectives. They managed to talk us into a two station solution that really was going to be on the edge of its capacity. We took the project on, and it cost us in terms of the added uncertainty and work required, but it also cost the Client in that it had a material effect on how efficient that machine could ever be.

Be certain that your proposed project is being considered very carefully and deeply by your potential supplier before they decide to take it on.

1.2 Another critical aspect of the sales process is the **accuracy of the Project Scoping undertaken by potential suppliers**. You should expect your supplier to demonstrate a level of expertise, and lead the process by asking you questions, and really listening to your answers, and seeking clarification where necessary.

1.3 To be 100% confident in what any automated machine supplier can deliver, an **absolutely key skill has to be their research capability**. Your prospective supplier should have done their homework thoroughly before they put forward their proposals, so they can provide reassurance that what they are proposing will work well.

1.4 Your supplier must have, and *religiously follow*, a defined sales process to eliminate potential pitfalls before you begin a project with them. So, don't be afraid to ask your supplier what their sales process involves, and how systematised it is. If you get a blank response, then that's a sure sign that their proposals may be as 'hit and miss' as their professionalism in this critical first stage of your project.

In summary, your ideal Supplier must be the leader, and have the expertise, confidence and systems to create a detailed project specification document that gets the approval from you, the Client.

2) CONCEPT STAGE

The more your project requirement can be simplified, the quicker and easier it is to arrive at the right concept that will not be unnecessarily complicated.

2.1 Consequently, a critical aspect of arriving at the best concept is **close contact between your supplier and you, the customer**. Expect and encourage your supplier to continuously come back to you, questioning and checking your requirements, and confirming that they are heading in the right direction, with buy-in from all parties involved.

2.2 Another important point when the project team discusses the concept, is that it doesn't **rely too heavily on past history**, and what has been done before. Whilst relevant experience is important, your supplier needs to avoid over-reliance on 'this is how we did it before'. Can your proposed supplier look at the problem and your requirements with a fresh pair of eyes, and think from first principles?

2.3 A related factor is that it's important for suppliers to be aware of, and **embrace, new technologies** and latest methodologies, rather than possibly being wedded to older practices that may, or may not, be appropriate.

2.4 Another key element of the concept stage is **value engineering** the proposed solution to double-check for opportunities to simplify or adjust the concept. This process also needs to accommodate any changes you may have requested since the original brief was agreed.

The value engineering should be done hand-in-hand with the engineer or project leader who is responsible for **documenting the fine details of the project**. It is critical that your supplier **maintains and updates one document** that combines and encompasses all aspects of the project (such as the Functional Design Specification – FDS - used by EBS Automation).

2.5 Another important aspect of the concept stage is to devote enough time to **calculating the consistency of the machine's cycle time**. The cycle time should be defined as accurately as possible before any actual engineering work is commenced. So when the target is for an Overall Equipment Effectiveness (OEE) of 85% for example, the supplier knows how close they are achieving their goal, without the inaccuracy of cycle times based on best 'guesstimates'.

At the end of the day, when a machine is put under pressure to achieve a specific OEE, if it is running on the edge of its capability because the cycle time was not accurately known before installation, then it will often eventually lead to problems once in operation.

In conclusion, it is critical that your potential supplier is given the time (and is actively encouraged) to do their due diligence at the concept stage, before committing to your job. As a professional client organisation, you need to acknowledge the supplier's responsibility to undertake the correct preparation work, and be prepared to actively participate in the process, if you are to achieve the very best results from the project and your investment.

3) PROJECT MANAGEMENT AND PLANNING

3.1 Any automation or special purpose machine will nearly always be operating as part of a larger production system. Therefore one of the most important elements of any successful project relates to **the lead times that are quoted by your supplier**.

To ensure accuracy of estimated lead times, this cannot be left to educated guesswork. **A formal planning process** must be employed which breaks the project down into distinct steps, each of which can then be analysed for time requirement. EBS Automation for example, employs a 14-step process which identifies key milestones and deliverables, and any reputable supplier should be able to show you in detail their project management systems.

3.2 And once lead times have been established, then planning and **communication** and interfacing with your supplier becomes vital. Making sure that you are all working on the right level of information and that nothing has changed in the specification without all parties knowing is the best way to avoid awkward and unpleasant conversations later on.

Naturally the fine details of your requirements may change with time, and it is your responsibility to make sure these are communicated to your supplier (and acknowledged by them) as quickly as possible.

It is worth recognising the **differences between ‘technical’ communications and the ‘commercial’ type** of communications. Because you obviously don’t want to be talking to too many people, it is important that you clearly establish from the beginning the best way to manage these very different types of conversation or correspondence. Do you want just one contact at the supplier, regardless of the context of the message, or would you prefer to channel different messages to different contacts within your organisation?

Clear points of contact established up-front, and then continuous communication with them throughout every stage within the project is a sound basis for efficient project management.

3.3 A further point to consider is that rather than just a management team doing the planning and project management and then feeding that down to the engineers, discuss with your supplier whether actual ‘ownership’ of your programme within their project team will offer additional benefits.

The importance of your supplier having a robust project management structure cannot be under-estimated, because probably **the majority of delivery and budget issues stem from the knock-on effects from delays** in elements of your programme (or even from other projects your supplier is delivering). The cumulative effect of multiple small delays can very quickly become significantly damaging to the overall success of your project.

4) TESTING & COMMISSIONING

This final part of the project jig-saw is often over-looked, but it can be a source of major headaches, particularly when the go-live date for your programme is getting closer and closer.

4.1 A key aspect from the Supplier's viewpoint is to have **clarity** from you on whether or not **any final modifications or tweaks** are required to the machine before the testing starts (which will inevitably delay the testing). So it is critical to nail down any final changes before testing has started.

4.2 The **testing regime and commissioning plan** should be detailed in writing as early as possible, then agreed and signed off by you, the client, so that you clearly know what is going to happen, and when. Then when the testing and commissioning begins, there will be no unexpected delays or oversights regarding functionality and operation of the machine.

4.3 Another aspect that needs addressing is to **identify any necessary training for your personnel**. People who are going to be operating your machinery should ideally have had a chance to 'buy into' the machine. Because if they don't, and it arrives on site as a bit of an 'alien', then it is much harder to get them to buy into it after it has become a 'fait accompli'.

The correct training means that there is no danger of production staff believing that the job is running correctly, when in reality your machine could be significantly less productive than its true potential and specification.

Organising good and thorough training, possibly even before commissioning on-site, should go a long way to ensuring the machine becomes almost immediately productive when it arrives.

4.4 Occasionally, it has been known for a machine to be pulled onto site early, before testing and commissioning is completed. This scenario should be avoided if at all humanly possible, because the machine cannot be signed off by your supplier, and the responsibility for the costs of any future fine tuning or 'bedding-in' inevitably becomes a subject of debate.

In an ideal world, the testing and commissioning should proceed without major surprises or hiccups! Should this not be the case, then it is inevitably a reflection and consequence of the previous three stages we have considered.

If the supplier's sales process was not thorough, if the basic concept is wrong or off-target, or if the management and planning of the project has been haphazard, then it will inevitably come to light at this final stage of testing and commissioning.

SUMMARY

Putting in the effort and commitment to make sure that you are always aligned with your supplier from day one, and along the whole of the project route, is the key to your success.

So, whilst it may come as no surprise, if you really do want to end up with **‘an automated machine that works like a dream, rather than one which frustrates and under-performs’** then the secret is to...

Get it right at the beginning (**where expectations are clearly set and agreed**), which then makes it much easier to...

Get the details right in the middle (i.e. an **optimised concept and painstaking project management**), which in turn leads to...

A very high probability that you’ll get it right at the end (via a **thorough testing** regime and **successful commissioning**).

CONCLUSION

I hope you’ve found this report interesting, and have picked up some useful tips and knowledge.

With a better insight into how to identify and select an appropriate supplier for your automated machine project, you should be better prepared to avoid the costly delays and frustrating misunderstandings that can undermine a successful project completion.

I wanted this report to be both informative and thought provoking – and to give you a benchmark against which you can judge different suppliers. If you have any comments or suggestions, please get in contact.

And if you are considering any special machine or automation requirement, then please take advantage of an informal, no obligation 15-minute telephone consultation with myself or one of my automation specialists. We will be delighted to chat with you and offer our best advice and guidance.

Yours sincerely,

Mike Evans
Managing Director

About EBS: EBS have been designing and manufacturing bespoke special purpose machines, automated and robotic systems for over 18 years, with engineers of combined knowledge and experience in excess of 150 years.

We provide tailored solutions to the Life Sciences, Automotive, Pharmaceutical and wider Industrial sectors in the United Kingdom, Spain, Poland, Czech Republic, Romania and Turkey.

For further information and free resources, please visit www.ebs.uk.com

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