



Every day a thousand things happen in the factory that cannot be standardised."

SUCCESS KILLERS OF CHANGE



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Professor Bick, looking back on the last five years: What has changed in the field of smart factories, which factors have proven to be critical for success?

I think we are at a different stage today than five years ago. At that time, companies wanted to find out above all how relevant Industry 4.0 was for them. Does anything need to be done at all? And if so, what are the areas that offer potential? Today, the strategic relevance of the Smart Factory has reached industry across the board. The focus is on the challenge of prioritising the individual topics in view of limited resources and generating results quickly. Ironical-

ly, this is also where the danger lies: because the best recipe for ensuring that nothing happens at all is to take on too much. A project typically starts with an assessment, from which potential initiatives with regard to the Smart Factory are derived and placed in a portfolio. Such a portfolio will contain perhaps 40 to 50 potential initiatives. And the worst thing you can do is to start with 30 of the 50 in the first step. Because then nothing will happen at all. We advise our clients to start with maybe two or three initiatives. But these must then be brought to life consistently - and only when these initial projects are largely completed do we consider what comes next.

What is the reason why people then so often act differently, get bogged down and fail to get things done?

It is not unusual for top management to be impatient and put pressure on the team. They want to start quickly, see results quickly - and as many of them as possible. At this point, the corporate culture proves to be a decisive factor. In companies where it is not common practice to constructively contradict the management, an action plan is then drawn up. In fact, many people already know that this is too ambitious and cannot work. But nobody has the courage to say, let's concentrate on one or two things.

And it would also be absurd to demand this courage from the employees. And so projects are created that are “set up to fail”. That is why this problem is far less pronounced in companies that work together on a cooperative basis, where discourse is part of the corporate culture.

So are too high expectations, pressure and fear the main reasons for failed projects?

That is at least one very important aspect. Another pillar of failure is to approach the issue at too high an altitude. The realisation of Industry 4.0 has a lot to do with experimentation and fault tolerance. You have to be prepared to get carried away if you enter uncharted territory. One or two things just won't work. But at least then you know that it won't work. As a company, you have to give people a certain amount of freedom to try things out and gain experience as a team. Of course, in the end, the whole thing has to work from a business perspective. But you must not see the way there as a straight track.

Now, “Trial & Error” has been preached for years, without the feeling that there is a lot going on in practice. How great is the actual willingness to act on this principle?

There are certainly companies that take this very seriously. A very good example is the BMW plant in Regensburg, which received the Industry 4.0 Award in the special category “People & Communication” in 2018. There they have managed to involve their employees. A lab has been set up in which people are given room to

manoeuvre, and not only on Industry 4.0 topics. Nothing is created in an ivory tower, but always very close to the practical requirements of the factory. And this combination works. The people are very committed, there are over 100 decentralised initiatives. A steering committee makes joint decisions and sets priorities. This in turn takes the pressure off the individual employees and something really happens afterwards.

Assuming that the framework conditions are right, but are people really willing to get fully involved, is this where the real “Google spirit” emerges, so to speak?

Yes, absolutely! It is not that we do not have people in the manufacturing industries, but rather that we do not demand and promote them accordingly. We must create the opportunities for people to develop. And that requires - as I said earlier - a culture that supports the whole issue. That is a question of mindset. If I have a large number of highly qualified and, above all, very creative employees, then that falls on fertile ground. What do many of them do away from the workplace? They pursue their own projects. There are gifted software developers and craftsmen who do all kinds of things in their spare time. So why not create the framework for this creativity in the company as well?

These spaces for creativity, but also many core processes in the factory, rely on strong informal communication networks. Will they remain useful and necessary in the Smart Factory?

Yes, 100 percent! Of course, stable and standardised processes are essential. But there are also a lot of things that happen every day in a company that cannot be standardised. The question when you talk about the Smart Factory is not whether you continue to communicate with each other, but how you can intelligently support communication. An example of this is the shift book, which used to be kept physically and is far from being thorough all the time and everywhere. This then led to information going badly between shifts - until it was not clear which job had which status. Or a machine was constantly malfunctioning. The solution was found, but not communicated to the next shift. Today, there are digital shift books that can be set up so well that the maintenance effort is low and the information flows directly from the machines and workstations into a cloud and is immediately accessible, perhaps even via a smartphone app. When the shift is handed over, everyone will then have the same level of information. I still have an intensive communication process, but it is simply much smarter and better supported.

In addition to informal communication, implicit expert knowledge is something that persistently eludes standardisation. Does the Smart Factory offer new solutions for this?

If people regard their experience and expert knowledge as dominating knowledge and are not willing to pass on this knowledge, you fail, no matter what tool you use. This was also one of the most important reasons why the ex-





pert systems of earlier years did not work. The question is why this willingness is missing. If a culture is characterised by fear, then it is not surprising that knowledge becomes a defensive weapon for the employee, and they do not want to share it. This is dramatic, because today we finally have the technical means to make this knowledge globally usable. Because we have the communication platforms to do so, which did not exist before. But you have to generate trust and identification so that people are prepared to make the implicit knowledge available to the company in a structured and documented way. In some companies it is a matter of course for employees to share knowledge. Today there are very good examples of such expert teams working on problems on a global basis in a global network, using knowledge tools. But even if all this works, it will always need experienced people, because some things simply cannot be formalised. And this appreciation of experience must also be anchored in the culture.

Doesn't rapid technological and social change lead to a generation gap between management and young employees? Do we still speak a common language?

Apart from the symbolism, management teams are still quite homogeneous. It is usually not quite so young people who have come to these management positions through a long classic career path. There are very open-minded, very agile people. But still it is not always easy to

place some topics. So you need a mediating level. People, perhaps department heads, who are both able to package messages in such a way that they reach a political level and to communicate with the young team in an Innovation Lab. Because I doubt whether these two very different worlds can always be let loose directly on each other. And that need not be the case if there are levels at which such activities are consolidated.

So the function of the interface manager, who is culturally and procedurally at home in both worlds, becomes more important in the Smart Factory?

This is a real criterion for success. You need experienced mediators between these systems and cultures, social translators who moderate and give impulses. They help to pick up ideas from the private lives of employees with a digital affinity and bring them into the company, and also help to build bridges within cross-sectoral ecosystems. This mediating role is relatively new. But I believe it will develop into a very important function within the company.

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