

INTERVIEW WITH FUTURIST LARS THOMSON

How Artificial Intelligence, Disruptive Innovations,
and Changes to our Mobility are Changing the
Automotive Industry

Automotive Industry 4.0 – Designing the Future Today



Autonomous driving, electric vehicles, and car sharing – the automotive industry is currently facing probably the biggest changes it has experienced in its entire history. At the same time, digitalization is revolutionizing production at a breathtaking rate. For the first time, this period of change is seeing new players enter the market and put pressure on the major manufacturers with disruptive ideas and a high degree of innovation. How can automotive companies navigate the path to Industry 4.0? How can they stay competitive? And what will the mobility of tomorrow look like? We spoke to futurist Lars Thomson about Production 4.0, artificial intelligence, and the mega-trends in the automotive industry.



OUR INTERVIEW PARTNER:



LARS THOMSEN

His theses and future scenarios are as accurate as they are provocative. Lars Thomsen is one of the world's leading futurologists and is one of the most influential experts on the future of energy, mobility, and smart networks. For over 20 years, he has been a self-employed consultant working with companies, corporations, institutions, and governmental agencies in Europe on the development of future strategies and business models of the future. He is the founder and chief futurist of the *future matters* think tank. Over the years, more than 800 companies have placed their trust in his expertise and nose for a trend. He uses roadmaps to predict a trend over a period of 520 weeks. His research focuses on the calculation of tipping points – disruptive developments in technologies, markets, and business models – each with a strong economic impact on industries and players. With his tried-and-tested methods, he succeeds in determining these points with an accuracy of around 18 months. Lars Thomsen is a keynote speaker at national and international congresses and meetings, giving lectures that inspire a wide range of audiences.

Digitalization has greatly transformed the manufacturing industry in recent years. What have been the biggest changes?

There are multiple phases to digitalization. In the first stage, we abolished all analog processes. Now it is about connecting all the elements involved in a process to the digital world. When we talk of digitalization as an emerging megatrend, however, it is somewhat misleading in my opinion. After all, we have been digitalizing our communication, our way of working, and much more over the last 30 years or so. From my futurist's perspective, I would say that the real change in manufacturing has only just begun. Namely, through artificial intelligence and the next developmental stage of the Internet (the Internet of Things) we will introduce completely new and unique intelligence into production.

What benefits can this bring to manufacturing?

Over recent years, a digital nervous system has emerged that has made machines and entire production facilities intelligent. Systems use pattern recognition to learn to avert mistakes and improve processes. I like to call this development “the end of stupidity”. Before, we had to make do with machines that were so “stupid” that people were always required to set them up and repair them. Thanks to artificial intelligence, machines and entire production systems can suddenly think for themselves.

According to the Digital 2016 Monitoring Report from the German Federal Ministry of Economics and Technology, we are only seeing an “average level of digitalization in companies” in the automotive industry. Why do you think that is so?

Because, to remain competitive, digitization was simply not necessary for a long time. The automotive industry has hitherto been a very protected industry. The goal of automotive manufacturers was to produce their next models more economically, more efficiently, and faster. But they were not challenged by any other industry. And there's another reason: a car was quite autonomous. Except for the fact it sometimes needed gas in the tank, it worked by itself.

And this has changed?

Yes, both things have changed. All of a sudden, newcomers from the consumer electronics and IT sectors have arrived on the scene, and are competing with the industry. These companies have a much higher rate of innovation and a different risk culture. Now, for the first time, the automobile industry is really being challenged – not from within, but from the outside. And due to digitalization, cars are no longer as autonomous. In the future, the car will be part of a networked system like a city, an energy system, or a communications structure. This increases the pressure to innovate and requires a digitalization strategy.

Which innovations do automotive companies need to stay competitive?

There are two different types of innovation – incremental and disruptive. While incremental innovation improves an existing system – for example, a model of car that is slightly lighter, faster, and more economical – disruptive innovations are much more fundamental. Does a car have to have a combustion engine? Or can a car drive itself? Until now, cars have had very long innovation cycles of 7 to 8 years. What is more, it is mainly about small-scale, incremental innovations. The new competitors from IT and consumer electronics have shorter innovation

cycles and more willingness – or expectation – to innovate. Thus, the automotive industry needs agile strategies urgently, and a readiness for disruptive innovations.

Why do you think the automotive industry is finding it so hard?

It is all about the management and innovation culture. If there is no competitive pressure from outside and the environment is known very precisely, there is not the positive kind of paranoia perhaps needed to operate in highly aggressive markets. At the same time, the automotive industry is faced with the enormous challenge of currently being confronted by three simultaneous mega-trends:

1. What will be under the hood tomorrow? i.e. combustion engines versus electrical motors.
2. Will we have to drive our own cars in future or will our cars drive themselves?
3. Does mobility for the individual in the future mean ownership of a vehicle or just access to one?

And when we realize that these three mega-trends will completely change the industry over the next decade, we will see the enormous pressure under which every decision in the production and development of automobiles will have to be made in the future.

What does this mean for manufacturing in real terms?

In manufacturing, we have to think “outside the box”. How can we use more flexible machines to produce vehicles? How can we increase value-add in production simply? And how can we implement changes or improvements in the production process in an agile way? For this, automobile production has a lot to learn from other industries. Experts from other industries are certainly needed to introduce new agility and a new innovative culture to the automotive sector. Tesla does this: only a minority of its developers previously worked in the automotive industry.

What role does IT play?

With modern IT, unique intelligence is created within production systems. Previously, the production manager needed a great deal of experience and built up valuable knowledge over years. Thanks to artificial intelligence, we are now dealing with systems that are so smart that they are not necessarily dependent on this knowledge. Intelligent systems themselves make suggestions on how processes need to be converted to complete production faster. Or they

even know themselves when a service is due – the keystone for Production 4.0.

How will IT continue to change production processes in the automotive industry?

Ideally, the process – from initial design through to the vehicle rolling out the factory – is supported to a far greater extent by intelligent systems and leading-edge software. This means a designer who is designing a new car on the screen is already being supported in the background by design software and production tools. In the end, the touch of a button is all it takes to produce the car in a fully automated way. At the moment, this sounds like a science fiction story but it is where we are headed!

What sort of a time frame are we talking about here?

The speed at which the changes are coming is rapid – much faster than most people think. Artificial intelligence, Big Data, and pattern recognition are developing much faster than the Internet. If we consider how fast development of the Internet was, and then if we raise that to the power of three, we can get some idea of the rapid pace at which changes are taking place in the development of artificial intelligence.

How will Production 4.0 affect the world of work in the automotive industry?

Workers who undertake very routine tasks will be replaced by robots or artificial intelligence over the coming years. This applies not only to production, but also to administration and engineering. Clearly, there will still be a need for people. However, the new requirements will create a different generation of production specialists and call for new qualifications. Those who do not deal with artificial intelligence today run the risk of not being needed in the future.

This is not such a great outlook for employees.

Well, there is no way to sugarcoat it. The actual turning point will probably become clear in the next two to three years – when the first manufacturers that previously produced tablets or smartphones suddenly start making cars. Today, tablets are manufactured completely autonomously. Companies will also design the product “car” from the beginning in such a way that the level of automation is similarly high to that of the production of consumer electronics.

You mentioned three mega-trends in the automotive industry. Will these developments happen in parallel or is there a trend that will become dominant more quickly than the others?

All three trends are occurring in parallel. This is what is so fascinating but also risky about the future. The price of batteries is dropping faster than all projections; by 50 percent every three years. This will lead to a parity point after which an electric vehicle is cheaper than a vehicle with a combustion engine – in 4 to 5 years time. In the case of autonomous driving, we are looking at a similar period of time until self-driving vehicles only account for one-tenth of accidents compared to cars driven by people. And then we will ask ourselves the question: as a society, do we really want to have 10 times as many accidents and traffic fatalities?

And what about ownership?

This is also changing in parallel with the other trends. A comparison: previously, we had to buy an expensive encyclopedia to gain access to knowledge. Today, we access the knowledge of the world through the Internet, which is much more up to date. The issue of mobility will be similar. Why should we buy a car for a lot of money if a vehicle comes to us at the press of a button, and we do not even have to search for a parking space because the car simply keeps driving?

You discussed new competitors from other industries. How intensive is the pressure they are bringing to bear?

One comforting fact is that building such complex devices as cars will continue to be an art form. However, I believe that over the next five years we will see around 10 new competitors enter the market, some of which will come from IT and consumer electronics. There is a lot of innovation in the new competitive situation. Take Tesla for example: the complexity of the car decreases as the drive unit is electrified. Tesla plans to reduce the number of installed parts to such an extent that the speed at which a car is produced is increased by a factor of 10 – meaning 1000% faster than before. With conventional, incremental thought processes, this is not possible. It can only be achieved with disruptive innovations, using artificial intelligence, and the next stage of intelligent robotics. The fact that aggressive players in the market with agile software and artificial intelligence will shape the production of the future is a major challenge for the industry.

Will high-profile manufacturers survive this challenge?

Whether all established brands can survive in this fight remains to be seen. Nokia was once the market leader of mobile phones, until the smartphone came and brought new players to the market. Development never fails to be exciting. And just because some trends did not come as fast as some thought, it does not mean that we will not have any changes in the coming years. This would be one of the most dangerous predictions for the automotive industry.

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