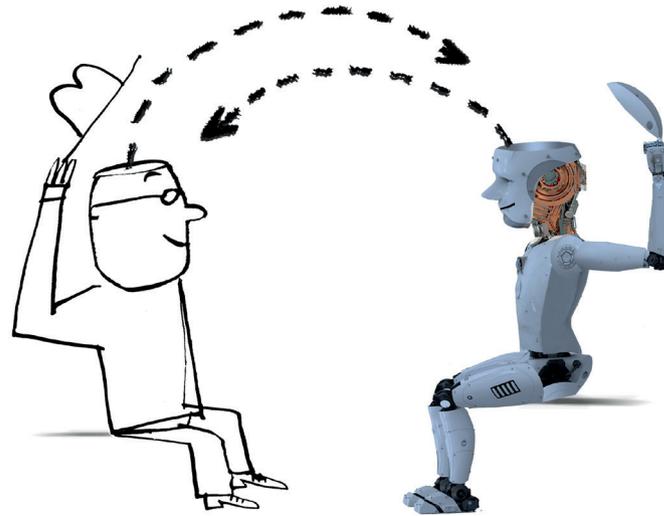




goetzpartners

STRATEGY | M&A | TRANSFORMATION



UNDERSTANDING THE BENEFITS OF AI

READ UP Reshaping Business Models

- + **Disruptive potential:** AI initiatives can only deliver genuine value when aligned with the core of the enterprise
- + **AI maturity:** Data quality and complexity are key factors
- + **AI investment decisions:** Companies have to do the heavy lifting today
- + **Window of opportunity:** Businesses should be ready for AI by 2022

CONTENT

- 01 THE NEXT WAVE OF TRANSFORMATION** — PAGE 07
- 02 STEERING CLEAR OF THE AI HYPE** — PAGE 08
- 03 THE POWER OF SOLVING PROBLEMS** — PAGE 12
- 04 RESHAPING BUSINESS MODELS** — PAGE 16
- 05 BUILD VERSUS BUY** — PAGE 20
- 06 PREPARE, PRACTICE, PLAY** — PAGE 24

METHODOLOGY

For the present study on artificial intelligence, we asked how AI (Artificial Intelligence) affects enterprises and their business processes, with particular focus on telecommunications enterprises and manufacturing companies. We reviewed and analyzed a range of latest studies and specialist publications and supplemented these insights with a detailed qualitative survey of experts in April and May 2018.

THE AUTHORS



DR ALEXANDER HENSCHEL

Managing Director, Munich & Dubai

Dr Alexander Henschel is a Managing Director in the Munich & Dubai office of goetzpartners and is responsible for the industry groups TMT and Business Services. Dr Henschel has in-depth consulting experience in the cable, media and telecommunications sector. Within these he advised numerous international companies in setting up and implementing large transformation programs as well as efficient and sustainable sales and marketing strategies. He is the author of various studies, including the goetzpartners study 'The Digital Challenge – Redefining Business Models in the Telecommunications Industry'. According to Dr. Alexander Henschel, Artificial Intelligence is one of the most important technology trends of our time. His expertise lies in the fields of digital assistants and the developments of smart homes.



MARKUS SCHMID

Managing Director, Munich & New York

Markus Schmid is a Managing Director at the Munich office of goetzpartners and is heading the office in New York City. Mr Schmid draws on ten years' experience in management board and managing director positions at companies such as SKY, TeleColumbus and PrimaCom and other organizations. Previous to these tenures, he spent eight years in management positions at corporate consulting firms, five of which at Accenture. In addition to restructuring and post-merger integration, his areas of expertise include change and innovation management. He has been responsible for numerous successful projects across a range of industries, including telecommunications and media, automotive, FMCG, retail and high-tech, where he also observes the developments of AI. Depending on the differences and peculiarities of these sectors, he emphasizes, that each enterprise will need to prepare differently for AI-based business models.

KEY INSIGHTS

-  Telcos and Industrials are by no means reluctant to use AI. However, they currently deploy the technology primarily to optimize existing processes with a view to gaining **COST SAVINGS AND GREATER EFFICIENCY**.
-  The potential of AI to be disruptive will unfold over the coming five to ten years, when it will **RADICALLY TRANSFORM BUSINESS MODELS IN TELECOMMUNICATIONS AND MANUFACTURING INDUSTRY**. By this point, at the latest, enterprises that lag behind other players in AI adoption or have failed to adapt their business models at all will suffer serious consequences. Yet despite the need for action, AI initiatives can only deliver genuine value if they are aligned with the **CORE OF THE ENTERPRISE** – they must fully embrace it and extend it. There is no point just jumping on the bandwagon without a sense of direction.
-  The **GREATEST AI MATURITY** is found in business models and processes based on data that is too extensive, complex or confidential to penetrate using human intelligence or conventional IT methods. Examples are network optimization and customer service in telecommunications, the entire field of predictive maintenance in manufacturing industry, and also processing of personnel data in HR.
-  Enterprises have to do the heavy lifting today in order to **MAKE THE RIGHT AI INVESTMENT DECISIONS** for their business later. As in digital transformation, startups can be strong partners. However, with AI technology being so complex, the upfront investment is often considerable. A clear investment strategy is imperative to minimize risk. It is also feasible to source the expertise from outside the company – a telco, for example, could work with an IT company as one of its suppliers, and obtain AI as a service.
-  The success of AI projects hinges on the **QUALITY OF THE DATA** – and in many enterprises this is surprisingly poor. AI is set to become a key business driver in the future, so it is imperative to overhaul legacy structures right now, before it is too late, and create a robust future basis for capturing high-quality, comprehensive customer data, process data and machine data.

01 THE NEXT WAVE OF TRANSFORMATION

We talk with Alexa, let our car park itself, and watch smart robots in action at Hanover Fair and CES in Las Vegas. There is no doubt about it: Artificial Intelligence is now part and parcel of our everyday lives, and features strongly on business agendas as a way to make enterprises fit for the future and keep them competitive. This is no slow-paced change. This new wave of transformation is approaching fast – it has taken just five to ten years of technology innovation to take AI from the sidelines and turn it into the Next Big Thing.

One reason for the hype is the sweeping visions that are being formulated. Technology providers such as Google, Intel or IBM talk of “improving people’s lives”, “reshaping business and society” and “the power of AI”. Meanwhile, enterprises in other industries are beset by uncertainty. Will AI genuinely revolutionize their business models? If so, how fast will it happen? And what form will the change take? Is it worth venturing beyond tentative pilot projects and splashing out on a major AI investment? What are the best areas for investment?

RIDING THE AI WAVE

In this study, we investigate the importance and potential of artificial intelligence for business, presenting latest data and research, as well as opinions from an industry insider survey on AI (‘market voices’). The study focuses on two industries in which 80% of enterprises already have some experience with AI, and which can expect AI-driven change to have a particularly significant impact: Telecommunications and Industrials.

What emerges clearly from the study is that the next wave of transformation will be driven by artificial intelligence. What we do today – how we get ready – will determine whether we encounter AI as a destructive tsunami or a perfect wave for our own renewal. The following chapters summarize what awaits enterprises in specific terms, and conclude with practical steers for action by our goetzpartners experts Dr. Alexander Henschel and Markus Schmid (‘executive briefings’).

“Hype is there and it can be easy to get carried away.”

Eden Zoller,
Principal Analyst,
Ovum

02 STEERING CLEAR OF THE AI HYPE

A look at the market reveals just how quickly the AI wave of change is approaching: many enterprises have at least moved beyond the initial experimentation stage.

83% OF TELECOMMUNICATIONS ENTERPRISES AND
77% OF MANUFACTURING COMPANIES

already use AI to automate business processes¹. A common place to start is by automating routines, or by deploying AI to improve inefficient processes, because these are areas where quick wins can be expected.

SPOTLIGHT ON: TELECOMMUNICATIONS

AI initiatives in telecommunications have so far centered around two main types of processes:

- Advances in speech recognition: with error rates down to just 4.9% in 2017,² enterprises are now better able to deploy chatbots and thereby **automate customer service**.
- In networks, artificial intelligence can ensure that loads are distributed intelligently and that demand predictions can be accommodated in **infrastructure planning**.

The telecommunications sector is certainly engaging seriously with AI. Deutsche Telekom's annual report depicts a range of AI-based innovations, including TINKA, the new digital assistant of Telekom Austria.³ In France, Orange employs 130 artificial intelligence specialists who do research on AI in connected homes, personal assistants and cybersecurity applications.⁴

SPOTLIGHT ON: INDUSTRIALS

AI is also gaining traction in manufacturing industry, albeit more slowly. On the one hand, Big Data, IoT, robotics and image recognition technologies offer huge opportunities. In 2016, AI in manufacturing had an estimated market volume of US\$ 272.5 million, predicted to grow to US\$ 4.88 billion by 2023.⁵ On the other hand, Industrials do face the challenge of making their already extensive automation compatible with AI.

The two key areas of application are currently:

- **Predictive maintenance:** machine data is captured and analyzed to predict when service is due, or to identify potential problems. Acerinox, the largest steel enterprise in Spain, is just one of the organizations using AI in this way.⁶
- **Logistics robots** that move autonomously through the warehouse using image recognition and smart control. These are developed by Siemens and other manufacturers.⁷

AI TREND AROUND THE WORLD

An international comparison reveals a momentum that is largely expected: with 1,000 enterprises and 850,000 AI professionals, the USA is the global market leader.⁸ Other countries have similar designs: the Chinese government is pursuing its plan to become global leader in AI research and innovation by 2030. China already leads in terms of the number of research publications: between 2011 and 2015, some 41,000 articles on AI topics were published in China. In second place was the USA, with around 25,000 publications.⁹

„Although most of the famous AI achievements come from the United States, several countries have made similar advances. With fast action plans, countries can either seize the commanding heights of innovation standardization, or else miss the opportunity. A global race for AI leadership has evolved and especially China has passionately declared its aspiration.“

Professor Dr. Zheng Han,
goetzpartners Chair Professor
of Innovation and Entrepreneurship
at the Sino-German School for Postgraduate
Studies (CDHK), Tongji University, Shanghai

“I see a major challenge in this craving for disruption (...). It leads to one questionable solution after another, born out of fear of missing a trend.”

Release Manager,
Software Corporation,
Germany

Enterprises in Europe are not far behind, as evidenced by the numerous examples in this study. However, it is important not to succumb to the pressure of expectations. The AI wave of change is rolling in fast, but it can be seen approaching – and now is the time to set one’s sails right and get ready for the fresh winds.

MARKET VOICES

“We are currently at ‘peak hype’, with expectations at their most inflated level. So it is important to manage these expectations realistically.”

VP at a Telekom Division, Germany

“It is important for CEOs to launch specific projects in their enterprises, evaluate the lessons learned, and then consider whether the fundamental vision for the enterprise needs to change.”

Head of Digitals, Industrials, Switzerland

“But it’s only today that we’re seeing three aspects converging: We have the need. We have the data. And we have the computing power. Even so, there’s a lot of glitter, but very little AI gold. Many so-called AI initiatives are just common-or-garden digitalization.”

Senior Researcher, DFKI

CASE STUDY

GREYORANGE – INTELLIGENT AUTOMATION OF LOGISTICS PROCESSES

GreyOrange’s “PickPal Butler”, introduced in Stuttgart (Germany), is used in GreyOrange’s logistics centers to replenish shelves. Combining AI and machine-learning systems, the high-speed auto-fulfilment robot can shift up to 600 packages per hour. GreyOrange expects the collaborative robot market to grow by more than 30% by 2025 in terms of global spending on robotics.¹⁰

EXECUTIVE BRIEFING



Sure, you need to engage with AI here and now. But there’s no point taking action just for the sake of it. We expect peak hype to be followed by the typical ‘trough of disillusionment’ over the next two to three years.

In fact, industrials often do not even have the data yet to deploy AI effectively. And telcos are likely to encounter resistance on the part of customers before they can move ahead.

*Our recommendation: Start with analyzing the impact of AI on your industry and business. **And don’t stop there: Test-drive AI in a modestly sized pilot project that can scale well if successful.***

In the industrial sector, AI can initially be integrated into the monitoring of selected new products or systems. And in telco, churn management initiatives would fit the bill. Smart forecasting and recommendation engines that propose ‘next best offers’ to customers based on their behavior can make a huge difference to keeping customers on board.



Dr Alexander Henschel,
Managing Director,
goetzpartners

*Remember that for experimental pilot projects, failure should be an option. If the project does not work, take it as a learning experience and start over. **As things stand, there are an estimated two to three years left for this experimental and learning phase.***



03 THE POWER OF SOLVING PROBLEMS

“One of the key challenges is to learn where the machine can help and how the interface between man and machine really works.”

Senior Researcher, DFKI

So what is in AI for the business? The value added does not emerge automatically from the type of AI technology used:

ONE IN TWO ENTERPRISES...

uses machine learning and image recognition. However, depending on the application, there is also demand for other AI technologies such as automated reasoning, robotics, knowledge representation or natural language processing.¹¹

The value derives essentially from what AI is at its core: it distils meaningful intelligence from data that is simply too extensive for human processing, makes predictions on the basis of this data and optimizes decisions. AI helps enterprises to reduce costs, offer their customers better service, or design products more closely around what customers want.

CURRENT TOP AREAS OF APPLICATION FOR AI IN BUSINESS¹²

MARKETING	INDUSTRIAL PRODUCTION	IT & IT SECURITY
<ul style="list-style-type: none"> ■ Cognitive assistants for conversational commerce, chatbots and assistants ■ Automated analytics for video content and cognitive content creation for digital marketing ■ Smart, adaptive advertising space ■ Anticipating future customer purchases as a basis for personalizing offers and tailor-made promotions ■ Automated monitoring of comments on social media 	<ul style="list-style-type: none"> ■ Robotics with intelligent and autonomous robots for production and warehouses ■ Autonomous transport such as driverless forklift and transport systems ■ Cognitive assistants for product assembly and development ■ Automated analysis for production monitoring and management ■ Self-controlling devices and systems aimed at creating an autonomous, intelligent factory 	<ul style="list-style-type: none"> ■ Analysis for detection and defense against security breaches ■ Automated answers and solutions to technology problems of users ■ Automated measurement of internal compliance

SPOTLIGHT ON: AUTONOMOUS MACHINES

Based on these characteristics, autonomous machines enable a degree of automation that has been impossible with conventional robotics.

3.05 MILLION

industrial robots are expected to be in use worldwide by 2020 – up from just 1.83 million units in 2016.¹³ Robot density in 2016 was highest in South Korea (631 robots per 10,000 employees in the manufacturing industry), followed by Singapore (488), Germany (309) and Japan (303).¹⁴

A relatively new development is the collaborative robot: instead of operating in a fenced-off-workspace, these robots work side by side with humans and can be fully integrated into existing production workflows. Using this technology, Chinese mobile phone manufacturer Changying Precision Technology has been able to increase productivity by 250% and reduce production errors by 80%.¹⁵

SPOTLIGHT ON: DIALOG ALGORITHMS

Speech recognition has made rapid progress in recent years:

1.37 BILLION

users will be using digital voice assistants by 2019 – almost twice as many as two years earlier, with growth rates unlikely to taper off any time soon.¹⁶

Dialog algorithms based on speech recognition technologies are used to improve customer service. Telefónica, for instance, has introduced a chatbot, Aura, which is to serve as the first point of contact for customer enquiries and concerns.

Conversational commerce takes this a step further. Here, digital assistants advise customers in a natural interaction. The interaction takes place fast and provides callers with extensive information. This could elevate online customer service to new levels and increase brand loyalty.

“The chance is that AI will bring about new solutions that would never be devised through human thinking and research.”

Head of Digitals, Industrials,
Switzerland

CUSTOMER NEEDS GUIDE THE ACTION

The greatest AI maturity is encountered in highly complex and data intensive processes, as illustrated by use cases in which known decision questions are optimized. Some enterprises are already setting their pricing with the help of AI to a level of detail that would be impossible using conventional means. Uber and Airbnb use millions of data points to optimize their pricing. The UK rail network has 55 million price points. And AI-driven, automated trading accounts already handle about 75% of the volume in financial markets¹⁷ – because they make better decisions at speeds unattainable by humans.

However, processes that directly translate into added value for customers are becoming more and more important, with great opportunities wherever AI can make the service not only more efficient, but more customer-oriented, and wherever products can be smartly and quickly adapted to customer requirements.

MARKET VOICES

“Artificial intelligence is not an end in itself (...). What’s happening now is that we are taking the digital transformation we began 25 years ago to the next level and evolving it. And AI can really help here, right across the board.”

Senior Researcher, DFKI

“First factor: Identifying where AI really works, where does it make sense and where not. Because AI is not a solution for everything!”

Director of Research & Data, Vodafone Spain

CASE STUDIES

BOSCH – PRODUCTION ASSISTANTS FOR AUTOMATION IN MANUFACTURING

Bosch offers its customers AI-supported APAS production assistants that are often installed in IoT devices. Designed to handle simple, monotonous or unergonomic tasks, the assistants are used primarily in the automotive industry and in FMCG production.

DEUTSCHE TELEKOM – AI-SUPPORTED CUSTOMER SERVICE

In customer service, T-Systems offers AI solutions based on the Amelia platform by IPsoft. Its virtual assistants Tinka, Sophie and Vanda take some of the workload of staff, thereby raising efficiency.¹⁸

EXECUTIVE BRIEFING



What problem do you wish to resolve with AI? That should be your starting question.

In the initial stage, this will most likely be cost and efficiency issues. Fortelcos, for example, network infrastructure efficiency is vital in terms of cost and service quality. Looking ahead, Huawei and others anticipate that AI will be the only feasible way to manage and optimize fast-growing mobile traffic, including rising volumes of video data.¹⁹

One case from the industrial sector is predictive maintenance, for example of aircraft engines. Particularly with such critical elements, it is vital to identify potential failures and take counteraction at an early stage.

In the mid- to long-term however, focus your attention on strengthening customer orientation through AI. A typical application scenario, where the algorithm learns and improves, are ‘next best offers’. Based on an analysis of buying behavior and individual needs, an AI-based system can distil this intelligence into identifying and offering the most appropriate upselling or cross-selling products or services. The better the data analysis, the greater the likelihood that the customer will bite.



Markus Schmid,
Managing Director,
goetzpartners

04 RESHAPING BUSINESS MODELS

“AI solutions can be both evolutionary and revolutionary.

We see both: enhancements that replace manual tasks and solutions that open up completely new dimensions via predictive maintenance or data analysis and deep learning.”

Release Manager,
Software Corporation,
Germany

The experts surveyed for the study agree: beyond enhancing existing processes, AI above all has the potential to be disruptive, and over the next five to ten years can be expected to radically transform entire industries.

It is of course inherently difficult to predict the exact nature of this disruption. What is certain, however, is that upheaval can always be expected where three factors converge:

- Conventional analysis does not work: AI, with its self-learning capabilities, can however identify patterns in the data and **make predictions**.²⁰
- Decisions are complex, but are based on constant rules: here, AI can be used to aid **decision-making**.
- Labor costs are high: AI-based automation will be relatively expensive, especially at the beginning. At the same time, AI can automate more complex tasks than present technologies and can for example simplify or **support middle management activities**.

Countless tasks for AI are created by the Internet of Things:

OVER **20 BILLION**

devices will be connected in the Internet of Things by 2020, and approximately 7.5 billion of these devices will be in business use.²¹ It is only by forging connections between AI and the technology already in place that we can unlock a new dimension of data analysis to power new business models around predictive maintenance in the industrial sector.

FULL-ON DISRUPTION

Some industries will be hit faster by this disruption than others. Gartner cites the healthcare industry as an example: AI-based diagnostics are now so advanced that in 52% of cases, they have been able to detect breast cancer a full year before conventional diagnosis.²² And the self-driving car shows the extent to which artificial intelligence could change our cityscapes and everyday lives. It also highlights the ethical and social issues raised by the technology – as evidenced by the question of what decision the self-driving car would take in the case of an unavoidable accident.

In telecommunications and manufacturing industry, AI projects have to date focused on increasing efficiency and reducing costs within existing processes.

Real-life cases, however, highlight AI's huge potential to bring about change.

“Most CSPs’ (Cloud Solution Providers) AI attention is on implementing cost savings and efficiencies as opposed to driving new revenue streams.”

Eden Zoller,
Principal Analyst,
Ovum

CASE STUDIES

AMAZON AND GOOGLE – SPEECH RECOGNITION AND USER EXPERIENCE

With a dedicated AI chip directly in the Alexa devices, Amazon is working to make it possible for voice commands to be processed directly rather than being sent to the cloud.²³ And the Google virtual assistant can make phone calls, arrange appointments, make reservations and ask questions using natural speech patterns that are virtually indistinguishable from having a conversation with a human on the phone.²⁴ Both technologies highlight the future opportunities of voice recognition in customer interaction or device control.

THYSSENKRUPP – PREDICTIVE MAINTENANCE FOR ELEVATORS

Based on the Microsoft Azure IoT services, thyssenkrupp MAX collects data from networked elevators in real time and calculates the remaining lifetimes of important systems and components using intelligent algorithms. The goal is to connect 180,000 elevator systems worldwide and reduce elevator downtime by up to 50%.²⁵

ADIDAS – SMART PRODUCTION

As part of its wider “Autonomic for Industry 4.0” program, adidas is working on an AI technology-based, automated “Speedfactory”, which is expected to cut the time from product design to shop shelf to around one week.²⁶

IBM AND PORT ROTTERDAM – SMART SHIPPING

The smart port of Rotterdam makes extensive use of IoT sensors to measure weather, water and communications data. With this intelligence, the port can shorten waiting times and choose the best arrival and departure times for cargo ships. The goal is to create networked, autonomous freight transport, with potential savings of up to US\$ 80,000 per hour.²⁷

MARKET VOICES

“We are on the verge of a true information age. AI has the potential to be disruptive. It will help every major industry to convert from data-centric to business- and information-centric.”

Michael Jude, Research Manager, Frost & Sullivan

“It is now becoming clear that, without significant domain knowledge and expertise, AI is ‘stupid’. When we look back, we will probably recognize that there has been a complete realignment.”

Head of Digitals, Industrials, Switzerland

“AI has a highly disruptive impact. It will change everything – because it has a bearing on both digitization and IoT. This is where AI comes into play, and this is how disruptive processes come into being. We are still scratching the surface.”

VP at a Telekom Division, Germany

EXECUTIVE BRIEFING



So far, AI has been used primarily to optimize existing processes. But remember the early stages of the internet: e-commerce was originally devised as a better way to manage the mail order business – yet the concept has since disrupted entire industries. Enterprises should therefore hone their ability to scan for new business model opportunities and drive their own innovations.

We expect the greatest changes in areas where adaptive AI systems connect with other technologies, thereby forging new synergies. Used properly, **AI creates the opportunity to identify early what customers are looking for**, to discover niches in the market as they unfold, and to have greater affinity with customers by offering exactly the right products, services and innovations.

To make this happen, **AI needs deep integration with internal processes and most enterprises will first need to set those up**. By thinking beyond use cases that work in isolation from others, and applying the same technologies, these companies are poised to upend an industry, create a new product category, shape a new business model and totally reconfigure value streams. Instead of today’s single purpose AI applications, such integration is possible only with a multipurpose AI platform.



Dr Alexander Henschel,
Managing Director,
goetzpartners

05 BUILD VERSUS BUY

In monetary terms, business anticipates big wins with AI. According to surveys, corporate executives expect ROI (Return on Investment) from AI investment to double within five years and increase threefold within a decade. Specifically, within three years, enterprises expect a ROI of US\$ 1.23 for every dollar they spend on AI. If this timeframe is extended to five years, the expected ROI is US\$ 1.99 per dollar of investment. And over ten years, ROI expectations rise to US\$ 2.87. Yet expectations aside, businesses are keenly aware how important it is to have a clear strategy for implementing AI, even citing it as the most important factor in achieving ROI targets.²⁸

MANY WAYS TO BUILD EXPERTISE

Artificial intelligence clearly requires investment. Gartner expects AI to rank among the top five investment priorities for CIOs by 2020;²⁹ Forrester estimates that between 2017 and 2020 AI investment worldwide will triple.

30% OF ENTERPRISES...

state that they are not investing enough in AI and therefore plan to step up investment as quickly as possible, i.e. within the next 36 months.³⁰

The investments take different forms:

- Investing in one's own technology means rethinking how IT is viewed. To date, technology or IT investment has routinely been seen as a cost factor. However AI is a **key enabler of innovation** and enterprise development, and should be budgeted for as such. In addition, an investment in AI technology involves **building skills and expertise** within the workforce, either by training existing staff or by bringing external specialists on board as part of teams.

When buying in competences, enterprises often look to investing in a startup. In 2017, Big Data and software company CB Insights registered 115 AI startups that were acquired by established enterprises, 44% more than the year before. That same year, venture capital totaling

US\$ 6 BILLION

was invested in AI startups.³¹

- However, AI startups are also viewed as a serious threat, whose dynamic go-getting attitude can be a danger to established players. According to Gartner, AI startups could oust the established technology providers as market leaders as early as 2019.³² Gartner's findings show that the active startup scene has brought a huge variety of solution packages onto the market – and for many enterprises, these **packages are an easier and much faster route to AI** than developing and building their own technologies.
- Accordingly, numerous alliances are being forged – to **co-develop new products** and services and **rebuild value chains around AI technologies**. In the telco sector, for instance, Deutsche Telekom is a shareholder of the German Research Center for Artificial Intelligence (DFKI) and is developing its own digital assistant there. Telefónica cooperates with Facebook, Google and Microsoft, enabling customers to communicate with its Aura assistant via Google Assistant, Cortana or Facebook Messenger.

CASE STUDIES

MARINE DIVISION OF CATERPILLAR – PREDICTIVE MAINTENANCE

Shipboard sensors monitor technical processes in generators, engines, GPS, air conditioning systems and fuel meters. These optimizations and predictive maintenance deliver savings of US\$ 30 per hour. An enterprise operating a fleet of 50 ships 24 hours per day, 26 weeks of the year could achieve more than US\$ 650,000 in savings per year.³³

INFINITE ANALYTICS – FORECASTS IN MARKETING

A forecasting tool for online ad placement predicts whether a user will click on a particular ad. One enterprise using this tool managed to triple the ROI from its advertising budget, and another increased revenue by US\$ 125 million annually.³⁴

In the industrial sector, Seat's "Breaking FAB" program gives external partners, including startups, researchers and designers, the opportunity to suggest innovative solutions for improving production processes at Seat's Martorell factory. In France, PSA has joined forces with the CNRS, Inria and the University of PSL to found the PRARIE (Paris Artificial Intelligence Research Institute), which aims to bring together leaders in AI from industry and academia.

MARKET VOICES

"In future, innovation budgets and also IT investments will have to make provisions for AI, that is new."

Head of Digitals, Industrials, Switzerland

"It's all a matter of money: deploying AI means investing at a level that listed enterprises will find is a tough sell to their shareholders."

Head of Digitals, Industrials, Switzerland

"The industry is currently being defined mostly through M&A. When we look at large players, we see that they are acquiring small start-ups and intellectual property to augment their AI capabilities."

Michael Jude, Research Manager, Frost & Sullivan

EXECUTIVE BRIEFING



The DIY approach to building AI competencies will only work for very few enterprises – and most of these will have an affinity with the tech sector and will already have specialist expertise in-house.

How you should proceed instead, will depend on your particular AI strategy and needs. For some applications, especially those focused on efficiency gains, it certainly makes sense to buy in AI solution packages.

However, if your goal is to evolve processes or even build new business models, this cannot be done just by buying in technology – a lesson that enterprises should have learned during the ongoing digital transformation.

To take the new ideas, approaches and innovations of AI right to the heart of the business, you'll need a different kind of investment. **You can look into collaborations with partners with the requisite expertise or ideas of their own. Another option is to invest in a startup whose innovative strength and dynamism can have a positive impact.**

In any case, the investment strategy is a key part of your AI strategy and essential for success.



Markus Schmid,
Managing Director,
goetzpartners

06 PREPARE, PRACTICE, PLAY

The core business reasoning for AI is still: what problem does an enterprise want to resolve, and what value does AI create for customers? On the technical level, if AI is cloud-based, data quality and Internet bandwidth are key to making the AI rollout a success. On the organizational level, what matters most – alongside the need for a clear strategy – is having the right expertise and enough cash to invest. Other success factors to single out are security and transparency.

GET THE TECHNICAL BASE RIGHT

DATA QUALITY

49%
OF EXECUTIVES

who participated in an AI implementation study believe that data management and data availability in their enterprise are not yet good enough to implement the desired AI technologies.³⁵

This concern is not unfounded. The results of AI applications stand and fall with the quality of the data. Since the systems can only ever learn from existing data, data quality is the decisive limiting factor.³⁶

BANDWIDTH

Especially in Germany and the USA, high-speed Internet availability remains a challenge – all the more so considering that processing of large datasets places significant demands on IT infrastructure. Measured against the leaders in Asia and Scandinavia, expansion of high-speed Internet in Germany and the USA is not yet progressing fast enough. As a case in point, in the first quarter of 2017, average Internet connection speeds were 28.6 Mbit/s in South Korea, 18.7 Mbit/s in the USA and just 15.3 Mbit/s in Germany.³⁷

CLEAR COURSE, COMPETENT TEAM

CLEAR STRATEGIC GOALS

AI-based business models can only be successful if – as stated above – the enterprise has a clear idea what problem is to be resolved, and what it hopes to achieve. This makes it easier to get people on side within the company – and success of AI in everyday use depends a lot on prevalent attitudes and mindsets.

EXPERTISE

The greatest opportunities to stand out from the competition lie with enterprises that blend artificial and human intelligence to create workflow synergies. AI cannot replace all the production processes – rather, it should contribute to automating work steps and accelerating time to value.³⁸

To make this happen, people need to be trained in scripting and how to program bots, algorithms, and automation tools.³⁹ Success with AI takes a highly skilled workforce that unites developer expertise, skills in math and statistics and knowledge of the industry in which the enterprise operates.

„I see a key challenge in the addiction to disruption, where managers and stakeholders want to apply a generic digitalization process to all areas, without having a specific idea or solution.”

Release Manager, Software Corporation, Germany

“AI brings new opportunities in general but requires a new workforce with changed skills and the right expertise. AI transfers technologies: new jobs appear, others disappear. It is important to continue being relevant.”

Director of Research & Data,
Vodafone Spain

“We don’t have metrics for companies to assess how quickly they respond to the market. But in the AI-enabled information infrastructure, this will be increasingly one of the metrics.”

Michael Jude, Research Manager, Frost & Sullivan

“One of the key challenges is to learn where the machine can help and how the interface between man and machine really works.”

Senior Researcher, DFKI

WILLINGNESS TO INVEST

AI requires considerable investment, not only in the technology itself, but also in upskilling staff and in training the AI system. If AI is to add value, it must be programmed and trained to meet the requirements of the enterprise. Particularly for smaller organizations, this outlay is a major hurdle to overcome.

CONTINUOUS OPTIMIZATION

AI systems are basically trainable and learn continuously through machine learning (ML) and deep learning (DL). However, they initially learn solely on the basis of the data they are provided with. If AI is to be kept in constant alignment with the enterprise’s strategic direction, there has to be a feedback function to enable the system to respond to changes.⁴⁰

SECURITY AND TRANSPARENCY

TRANSPARENCY AND CONTROL

The danger of AI systems becoming independent and turning into a threat is a far-fetched notion – yet transparency and control remain typical challenges on the path to successful AI deployment. The thing about self-learning systems is that it is difficult to determine how and why they reach a particular decision. It is therefore also difficult to diagnose and correct errors. Moreover, neural networks deal with statistical – not absolute – truths, making it even more challenging to create fully secure systems. Enterprises should be aware of these limitations and take them into account when designing AI applications.⁴¹

In addition, AI systems or neural networks require constant monitoring and maintenance. Gartner estimates that by 2020 approximately 20% of enterprises will deploy staff to monitor and control neural networks.⁴² The skillsets required to perform this work must also be considered in the AI strategy.

SECURITY AND ETHICS

To alleviate data privacy concerns, stakeholders need to fully address the legal and security questions around AI, and also engage openly with the ethical questions rather than attempting to gloss over them.⁴³ Dialog between politics and business is imperative, the objective being to hammer out a legal framework that provides enterprises with legal certainty, and creates a basis to assuage consumers’ fears and encourage them to embrace AI as a future technology.

MARKET VOICES

“Also, like any technology, a business must be ready to adopt and adapt to new tools. Time and time again we see the businesses, mainly employees, are resistant to change and are unwilling to undergo constant improvement.”

Change Consultant, UK

“The challenge is also consistently the fact that data must be made available through means that are highly resource-intensive.”

Head of Digitals, Industrials, Switzerland

“In my view, engaging ethically with AI is a more pressing issue than the shortage of skilled professionals in the field.”

VP at a Telekom Division, Germany

EXECUTIVE BRIEFING



Enterprises should not consider AI as a one-off experiment. Regardless whether your strategy is proactive – targeted at creating competitive advantage – or more defensive in nature, you must take three key points into account:

- A clear commitment of management to AI strategy as a corporate goal
- The creation of a core team committed to making it work
- Open communication into the organization to ease preconceptions and possible fears on the part of employees and give people the feeling they are part of what is happening

If AI does not yet feature on your agenda or you are still in the early experimental phase, there is a chance to do the important preparation now. **Data quality is surprisingly poor in many organizations – you can make key changes right now, and overhaul legacy structures to create a future basis for capturing comprehensive and high-quality data from customers, processes and machines.** If you are in early stages, you should also make a start on building AI expertise.

In case you have already rolled out first AI projects, now is the time to define your goals and strategy before proceeding to the next step. You should also stake out your investment plans and investigate security and privacy issues around AI.

If you already have introduced AI on a widespread basis for new processes and business models, what matters now is encouraging people to take AI on board as integral to the organization's way of doing things. By this point at the latest, it is time to participate in the wider societal debate around AI. Internally and externally, stakeholders should be communicating the value of AI and making clear the ethical principles.

By 2022, businesses should be ready and prepared to fully implement AI – and you should use the coming two years to gain practical experience in trial projects.



Dr Alexander Henschel,
Managing Director,
goetzpartners

KEYS TO AI SUCCESS

1

FIRST THINK!

- Steer clear of the hype
- Analyze impact of AI
- Experiment & learn

2

DEFINE THE PROBLEM YOU WANT TO SOLVE!

- Assess AI maturity of business models and processes
- Upgrade service efficiency
- Get closer to your customers

3

GET READY FOR DISRUPTION!

- Use AI to discover market niches as they unfold
- Go beyond single-purpose AI platforms to enable new value streams
- But stay aligned with the core of the enterprise

4

PARTNER FOR EXPERTISE!

- Collaborate with partners with the requisite expertise or ideas
- Consider start-up investments for dynamic innovation
- Commit to a clear AI investment strategy

5

AND ACT!

- Overhaul legacy structures to get data quality right
- Communicate openly into the organization to ease preconceptions
- Start with trials and channel the lessons learned into adapting the core processes

07 BENEFIT FROM THE WINDOW OF OPPORTUNITY

AI will change processes and business models in telecommunication enterprises and industrial companies. Process change is likely to occur within the next three to five years. The timeframe for changes to business models is longer, between five and ten years.

On the process side – in finance, HR, production, or in the supply chain – AI can help to prevent mistakes, shrink processing times, and reduce overall costs. Data protection concerns are also likely to drive AI adoption, notably in HR: as personal data becomes increasingly regulated and protected against human access, AI will over the next five years become the solution of choice for handling the personal data of employees and staff appraisals. In training and continuing professional development also, enterprises will rely heavily on assistants and programs with artificial intelligence.

It is up to individual enterprises to decide on how intensively they will use AI as a route to renewing their own business models. So far, most are focusing AI efforts more on optimizing existing processes than on generating new revenue streams or devising new business models. These enterprises run the risk

of being overtaken by more innovative and dynamic competitors a few years down the road – just as happened with digital transformation.

However, enterprises should not conclude that they need to integrate AI at all costs into all their business processes. The idea is to start with the non-core processes within the business, acquire experience, and then channel the lessons learned into adapting the core processes. Enterprises should work out what value AI can add, and what opportunities it can deliver in terms of fresh approaches, product innovation or revenue streams. In a telecommunication company, for example, this can involve using AI in network planning, sales (next best offer), customer management (churn prediction & prevention), or predictive maintenance.

The window of opportunity is still wide open. However, there are only two to three years to complete the AI experimenting and learning phase. During this time enterprises should make the necessary preparations and develop a strategic approach to AI.

- 1) Leadership in the Age of AI - Adapting, Investing and Reskilling to Work Alongside AI, Infosys 2018: <https://www.infosys.com/age-of-ai/Documents/age-of-ai-infosys-research-report.pdf>
- 2) The Business of Artificial Intelligence, Harvard Business Review 2017: <https://hbr.org/cover-story/2017/07/the-business-of-artificial-intelligence>
- 3) Annual Report 2017, Deutsche Telekom 2017: https://www.annualreport.telekom.com/siteo218/fileadmin/GB17/EN/PDF/20180309_GB2017_EN_COMPLETE.pdf
- 4) Cultivating competitive and responsible Artificial Intelligence in Europe, Orange 2017 <https://www.orange.com/fr/content/download/47609/1376586/version/2/file/Orange%20views%20on%20Artificial%20Intelligence.pdf>
- 5) Artificial Intelligence in Manufacturing Market by Offering, Technology, Application, Industry, and Geography - Global Forecast to 2023, PR Newswire 2017: <https://www.prnewswire.com/news-releases/artificial-intelligence-in-manufacturing-market-by-offering-technology-application-industry-and-geography---global-forecast-to-2023-300501418.html>
- 6) Artificial Intelligence in Manufacturing Market by Offering, Technology, Application, Industry, and Geography - Global Forecast to 2023, PR Newswire 2017: <https://www.prnewswire.com/news-releases/artificial-intelligence-in-manufacturing-market-by-offering-technology-application-industry-and-geography---global-forecast-to-2023-300501418.html>
- 7) Artificial Intelligence, Factsheet, Siemens 2016: <https://www.siemens.com/press/pool/de/events/2016/corporate/2016-12-innovation/inno2016-artificial-intelligence-e.pdf>
- 8) These Seven Countries Are In A Race To Rule The World With AI, Forbes 2017: <https://www.forbes.com/forbes/welcome/?toURL=https://www.forbes.com/sites/forbestechcouncil/2017/12/05/these-seven-countries-are-in-a-race-to-rule-the-world-with-ai/2/8ref>
- 9) Jacobsen, Bruno: Blog Future Proof, 5 Countries Leading the Way in AI, 2018: <https://www.futuresplatform.com/blog/5-countries-leading-way-ai-artificial-intelligence-machine-learning>
- 10) GreyOrange launched AI-powered Butler PickPal to revolutionise autonomous fulfilment in logistics centers, Grey Orange 2018: <https://www.greyorange.com/press/GreyOrange-launched-AI-powered-Butler-PickPal-to-revolutionise-autonomous-fulfilment-in-logistics-centers>
- 11) Leadership in the Age of AI - Adapting, Investing and Reskilling to Work Alongside AI, Infosys 2018: <https://www.infosys.com/age-of-ai/Documents/age-of-ai-infosys-research-report.pdf>
- 12) AI as market of the future - Potentials and applications, Fraunhofer Alliance Big Data 2017: https://www.bigdata.fraunhofer.de/content/dam/bigdata/de/documents/Publikationen/Fraunhofer-Studie_ML_2018_WEB.PDF
- 13) Estimated number of industry robots globally in 2010 to 2020, Statista 2018: <https://de.statista.com/statistik/daten/studie/250212/umfrage/geschaeztzter-bestand-von-industrierobotern-weltweit/>
- 14) Number of robots in manufacturing industry by selected countries in 2016, Statista 2018: <https://de.statista.com/statistik/daten/studie/515879/umfrage/roboterdichte-nach-laendern/>
- 15) Artificial Intelligence in healthcare and beyond, Insight Rush 2017: <https://insightrush.com/blogs/blog/impact-of-artificial-intelligence-on-industries>
- 16) Number of users of digital assistants globally from 2015 to 2021, Statista 2018: <https://de.statista.com/statistik/daten/studie/620321/umfrage/nutzung-von-virtuellen-digitalen-assistenten-weltweit/>
- 17) Artificial Intelligence in healthcare and beyond, Insight Rush 2017: <https://insightrush.com/blogs/blog/impact-of-artificial-intelligence-on-industries>
- 18) AI supported decision-making, DFK & bitkom, 2017: <https://www.uni-kassel.de/fb07/fileadmin/datas/fb07/5-Institute/IWR/Hornung/170901-KI-Gipfelpapier-online.pdf>
- 19) Artificial Intelligence for 5G: Challenges and Opportunities, Huawei 2017: http://www.comelec.telecom-paristech.fr/uploads/tx_dbcomelec/Debbah_AI5G_30-03-2017_.pdf
- 20) Big Data Analytics: Cloud-supported machine learning services, Analytics Magazine 2016: <http://analytics-magazine.org/big-data-analytics-cloud-supported-machine-learning-services/>
- 21) Internet of Things (IoT) connected devices installed base worldwide from 2015 to 2025 (in billions), Statista 2018: <https://www.statista.com/statistics/471264/iot-number-of-connected-devices-worldwide/>
- 22) The Disruptive Power of Artificial Intelligence, Gartner 2017: <https://www.gartner.com/smarterwithgartner/the-disruptive-power-of-artificial-intelligence/>
- 23) Amazon: This new AI chip makes Alexa faster and smarter, t3n 2018: <https://t3n.de/news/amazon-AI-chip-alexaschneller-schlauer-947067-947067/>
- 24) Google's robot assistant now makes eerily lifelike phone calls for you, The Guardian 2018: <https://www.theguardian.com/technology/2018/may/08/google-duplex-assistant-phone-calls-robot-human>
- 25) Digital transformation strategies from ThyssenKrupp North America's CEO, IoT 2017: <http://www.ioti.com/industrial-iiot/digital-transformation-strategies-thyssenkrupp-north-america-s-ceo>
- 26) AI supported decision-making, DFK & bitkom, 2017: <https://www.uni-kassel.de/fb07/fileadmin/datas/fb07/5-Institute/IWR/Hornung/170901-KI-Gipfelpapier-online.pdf>
- 27) IBM partnership aims to create smart shipping port with IoT sensors, AI, big data, 2018: <https://www.techrepublic.com/article/ibm-partnership-aims-to-create-smart-shipping-port-with-iiot-sensors-ai-big-data/>
- 28) State of Artificial Intelligence for Enterprises, Teradata 2017: <https://www.multivu.com/players/English/8075951-teradata-state-of-artificial-intelligence-ai-for-enterprises/docs/stateofartificial-1507336238393-904537415.pdf>
- 29) Gartner Says AI Technologies Will Be in Almost Every New Software Product by 2020, Gartner 2017: <https://www.gartner.com/newsroom/id/3763265>
- 30) Predictions 2017: Artificial Intelligence Will Drive The Insights Revolution, Forrester 2016: https://go.forrester.com/wp-content/uploads/Forrester-Predictions_2017-Artificial_Intelligence_Will_Drive_The_Insights_Revolution.pdf
- 31) The Race For AI: Google, Intel, Apple In A Rush To Grab Artificial Intelligence Startups, CB Insights 2018: <https://www.cbinsights.com/research/top-acquirers-ai-startups-ma-timeline>
- 32) The Road to Enterprise AI, Gartner 2017: https://www.gartner.com/imagesrv/media-products/pdf/rage_frameworks/rage-frameworks-1-34JHQoK.pdf
- 33) IoT And Big Data At Caterpillar: How Predictive Maintenance Saves Millions Of Dollars, Forbes 2017: <https://www.forbes.com/sites/bernardmarr/2017/02/07/iot-and-big-data-at-caterpillar-how-predictive-maintenance-saves-millions-of-dollars/#550721fe7240>
- 34) Brynjolfsson, Erik; McAfee, Andrew: The Business of Artificial Intelligence, Harvard Business Review 2017: <https://hbr.org/cover-story/2017/07/the-business-of-artificial-intelligence>
- 35) Leadership in the Age of AI. Adapting, Investing and Reskilling to Work Alongside AI, Infosys 2018: <https://www.infosys.com/age-of-ai/Documents/age-of-ai-infosys-research-report.pdf>
- 36) The biggest limitation of artificial intelligence is it's only as smart as the data sets served, South China Morning Post 2018: <https://www.scmp.com/business/china-business/article/2131903/biggest-limitation-artificial-intelligence-its-only-smart>
- 37) Average speed of internet connectivity in the world's leading countries in Q1 2017, Statista 2018: <https://de.statista.com/statistik/daten/studie/224924/umfrage/internet-verbindingsgeschwindigkeit-in-ausgewaehlten-weltweiten-laendern/>
- 38) The Business of Artificial Intelligence, Harvard Business Review 2017: <https://hbr.org/cover-story/2017/07/the-business-of-artificial-intelligence>
- 39) Ashwini, Amit: How To Create A Successful Artificial Intelligence Strategy, in: The Startup, 2018: <https://medium.com/swlh/how-to-create-a-successful-artificial-intelligence-strategy-44705c588e62>
- 40) It's Time To Adopt AI Into Your Business Model, Forbes 2018: <https://www.forbes.com/sites/forbesagencycouncil/2018/05/16/its-time-to-adopt-ai-into-your-business-model/#24e90b5fdcc3>
- 41) The Business of Artificial Intelligence, Harvard Business Review 2017: <https://hbr.org/cover-story/2017/07/the-business-of-artificial-intelligence>
- 42) The Disruptive Power of Artificial Intelligence, Gartner 2017: <https://www.gartner.com/smarterwithgartner/the-disruptive-power-of-artificial-intelligence/>
- 43) The Business of Artificial Intelligence, Harvard Business Review 2017: <https://hbr.org/cover-story/2017/07/the-business-of-artificial-intelligence>

CONTACT

DR ALEXANDER HENSCHEL
Managing Director
alexander.henschel@goetzpartners.com

MARKUS SCHMID
Managing Director
markus.schmid@goetzpartners.com

goetzpartners
Prinzregentenstr. 56
80538 Munich, Germany
T +49 – 89 – 29 07 25 – 0
contact@goetzpartners.com



www.goetzpartners.com

Edited by:
Text100, Munich, Germany
Design:
milk&honey advertising, Munich, Germany
Illustrations:
Serge Bloch, Paris, France
Photography goetzpartners:
Esther Neuman, Munich, Germany
Printing:
DruckStreich, Taufkirchen, Germany

© goetzpartners, September 2018

This document is copyright-protected. Its reproduction, rental or any other form of distribution or publication – including in extract form – is subject to the consent of goetzpartners. The analyses and assumptions on which this publication is based were undertaken by the authors to the best of their knowledge and judgment. goetzpartners accept no liability whatsoever for the accurateness of these analyses or assumptions. Where information was taken from public sources its accuracy and completeness was assumed without any further checking. By its very nature, this publication does not take into account the specific circumstances of individual cases. This document can therefore not replace individual expert advice or extensive research which should be undertaken by the third party.