Artificial Intelligence in Europe

Outlook for 2019 and Beyond

How 277 Major Companies Benefit from AI

REPORT COMMISSIONED BY MICROSOFT AND CONDUCTED BY EY
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AI will be useful wherever intelligence is useful, helping us to be more productive in nearly every field of human endeavor and leading to economic growth.

— Harry Shum, Executive Vice President of Microsoft AI and Research Group & Brad Smith, President and Chief Legal Officer at Microsoft
Human Ingenuity

The printing press, the automobile & the Internet are just a few technological achievements that have advanced our world. All were driven by human ingenuity: our innate creativity that inspires us to learn, imagine & explore. This spirit is what pushes us to challenge the boundaries of the possible to go ever forward.

Today, AI is helping to amplify our human ingenuity, opening up exciting new possibilities for how intelligent technology can shape our world. At Microsoft, our goal is to democratize access to AI for everyone through innovative & powerful platforms, & above all, we’re focused on ensuring that our AI tools & technologies are deployed responsibly & earn people’s trust.

And yet, we realize that AI is one of the lesser understood modern technological break-throughs. Many questions remain. How are companies applying this technology to empower employees, engage with customers, transform their business and optimize their operations? Where are they seeing benefits, and what are their blockers?

To provide answers, Microsoft commissioned this study to understand the AI strategy of major companies across 7 sectors & 15 countries in Europe. It examines these companies’ readiness to adopt AI, how they rate the impact and benefits from AI implementations, and what they perceive as risks & keys to success.

We hope you find these insights inspirational for your own journey toward adopting AI & realizing its benefits for amplifying human ingenuity.

Vahé Torossian
President, Microsoft Western Europe
At a Glance

Most impact expected from ‘optimizing operations’, with ‘engaging customers’ as a close second

89% of the respondents expect AI to generate business benefits by optimizing their companies’ operations in the future. This is followed by 74% that expect AI to be key to engaging customers by enhancing the user experience, tailoring content, increasing response speed, adding sentiment, creating experiences, anticipating needs, etc.

C-suite respondents scored ‘engaging customers’ highest of the AI benefit areas. Noticeably, ‘100% of the most advanced’ companies expect AI will help them engage customers, compared to only 63% of the less mature companies. Using AI to ‘transform products and services’ comes out slightly lower with 65%, and ‘empowering employees’ the lowest with 60% of the companies expecting AI-generated benefits in that area.

AI is expected to impact entirely new business areas in the future 57% of the companies expect AI to have a high impact or a very high impact on business areas that are “entirely unknown to the company today”. This is almost as much as AI is expected to impact the core of these companies’ current business with 65% expecting AI to have a high or a very high impact on the core business. With AI presumably pushing companies into totally new domains in the future, it is perhaps not surprising that AI is receiving attention as a key topic for executive management.

Very few of the 277 companies consider themselves “advanced” with AI

Despite the apparent sizable impact that companies expect from AI, only a very small proportion of companies, constituting 4% of the total sample, self-report that AI is actually contributing to ‘many processes in the company and enabling quite advanced tasks today’ (referred to as ‘most advanced’ in this report).

Another 28% are in the ‘released’ stage where they have put AI selectively to active use in one or a few processes in the company. The majority, 51% of companies, are still only planning for AI or are in early stage pilots. 7% of companies are self-rated as least mature, indicating that they are not yet thinking about AI at this stage.

What sets the most ‘AI mature’ companies apart?

They expect AI will be beneficial in ‘empowering employees’ (76% of ‘more mature’ companies vs. 42% of ‘less mature’ companies).

They report using a combination of structured and unstructured data for AI (65% of ‘more mature’ companies vs. 15% of ‘less mature’ companies), and data from both internal and external sources (68% of ‘more mature’ companies vs. 16% of ‘less mature’ companies).

They expect AI will help them ‘engage customers’ (85% of ‘more mature’ companies vs. 59% of ‘less mature’ companies).

They see AI predominately being driven from a combination of technology push and business pull (61% of ‘more mature’ companies vs. 32% of ‘less mature’ companies).

Noticeable potential for AI in many corporate functions

The most widely reported adoption of AI (47%) was in the IT/Technology function, followed by R&D with 36%, and customer service with 24%.

Interestingly, several functions are hardly using AI at all; most notably, the procurement function, where only 4% of the companies currently use AI, followed by HR with 7% and product management with 9%. This is perhaps surprising, given the many use cases and applicable solutions in these functional areas.

8 key capabilities that are most important ‘to get AI right’

When asking the respondents to rank the importance of 8 capabilities to enable AI in their businesses, ‘advanced analytics’ and ‘data management’ emerged as the most important. ‘AI leadership’ and having an ‘open culture’ followed.

When self-assessing the capabilities where the companies are least competent, they point to emotional intelligence and AI leadership - defined as the lack of ability to lead an AI transformation by articulating a vision, setting goals and securing broad buy-in across the organization.

To summarize, the challenge ahead appears to be as much about culture and leadership as it is about data, analytics, and technology.

Only 4% of the companies are actively using AI in ‘many processes and to enable advanced tasks’

Percentage of companies that are still only in the planning or piloting stages:

61% of the companies respond that AI is considered ‘an important topic’ on the executive management level

57% of the companies expect AI to have a high impact on ‘business areas that are entirely unknown today’

Share of companies that use acquisitions as a way to obtain AI capabilities:

10% only

80% of the most mature companies expect that AI will be beneficial by ‘empowering employees’
Artificial Intelligence (AI) is not new. It has existed for decades: processing voice to text or language translation; real-time traffic navigation; dynamically serving targeted advertisements based on personal data and browsing history; predicting trends and guiding investment decisions in financial institutions. The current developments have been fueled by an exponential rise in computing power, increasing accessibility and sophistication of powerful algorithms, and an explosion in the volume and detail of data available to feed AI’s capabilities.

Reality vs. hype

Only recently started to see more widespread, scaled adoption of AI across sectors, value chains and ecosystems. Yet AI technology is quickly approaching a point where it is becoming a critical element in enabling companies across sectors to drive revenue, increase profits and remain competitive.

We hear many people in numerous companies talk about AI. While the hype is pervasive, not a lot of people fully understand its technological potential, where it can create value or how to get started. This report aims at providing a practical understanding of why European companies are investing in AI, what they are investing in, and how they are managing the complicated process of adopting this new technology and deriving value across business opportunities.

Perspectives, experiences, self-assessment, and benchmarks

From new surveys, interviews and case studies gathered from approximately 277 companies, we provide a snapshot of the current state of AI in 15 European markets. This includes analyzing AI’s relative importance on the strategic agenda, its expected impact and benefit areas, how mature companies are in terms of adoption, and examining self-reported competence levels regarding the capabilities required to succeed when implementing AI.

From the aggregate dataset we have been able to determine some benchmarks across the covered markets, which we compare the individual country with throughout the report. The report also covers a full spectrum of industry groups which tend to reveal interesting insights.

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Straight from the executives

Where this report and extensive dataset adds new insights is primarily into how leading companies are approaching AI on a very practical level. We hear straight from executives how their companies are addressing current challenges, and how they apply AI to unlock new value pockets.

Based on the many interviews conducted, this report reveals some clear excitement and immense potential for using AI to bring new, improved products and services to market, create exceptional experiences for customers and employees, and create ways to operate that enhance performance across the board.

We learned that regardless of which use cases the companies pursue and the role that AI currently has, taking a strategic outlook to assess the implications for the business and responding accordingly are increasingly seen as crucial for any executive agenda.

Contributions from open-minded and collaborative companies

We are extremely thankful for the time and effort the many executives have put into participating in interviews and providing data for this study. We’re particularly appreciative of their willingness to openly share experiences and provide their perspectives on where the future is heading within AI.

While this indicates a general interest in the AI topic, it also speaks to the increasingly collaborative approach many leading companies are taking when entering new technology domains and embarking on journeys into unknown territories.

During the past few years, we have learnt what is easy, what is hard, what is realistic and what is only hype.

— DNA
Telecommunications

One of the key challenges is meeting the high expectations from the organization - AI is not magic, but takes considerable effort to successfully implement.

— H. Lundbeck
Pharmaceuticals
This report combines multiple sources of data to answer the questions of why, where and how AI is currently being used in business. It provides an inside view across markets and sectors. It provides a pan-European view, and adds value through a quantitative perspective on how advanced companies are with AI, and a qualitative perspective on how to develop the skills required to succeed with AI. We have received input from over 300 people from 277 participating companies. This has resulted in a range of interviews and case studies as well as 269 company responses to our survey.

Extensive online survey data from business leaders in 269 companies
We have surveyed people with a leading role in managing the AI agenda in all the companies that have contributed to the study. This gives us an aggregate dataset that enables a perspective for each market and each sector, as well as comparative insights for the respective company types, sectors, and countries in Europe.

Qualitative in-depth interviews with senior business executives
In addition, we conducted deep-dive interviews to gain deeper, qualitative insights into how AI is affecting the executive agenda. Through conversations with business leaders, we report on where they expect AI will have an impact, how important AI is to their current and future business strategies, what benefits they hope to realize from implementing AI, and which capabilities they believe are key to advance AI maturity in their companies.

We also present case studies of specific companies from different countries to provide an understanding of what they are doing with AI and why, drawing on lessons learned and obstacles to overcome when putting AI to use for specific use cases and to derive value on a strategic level.

Proprietary AI investment data
We have supplemented the primary source input from the companies with acquisition data from numerous sources, to take the pulse of the AI investment market in Europe. These insights help provide a picture of the wider European AI ecosystem and its development.

AI expert perspectives
With this wider understanding of AI start-up acquisitions, partnerships, and investment funding, we outline how investments in AI are skyrocketing, where AI investment is taking place geographically, and which sectors are making bets. As we are on the cusp of widespread change driven by AI, we also reached out to AI experts from academia for an outlook of AI technologies going mainstream, and to gain an understanding of the macro scale of business effects that they expect will materialize when looking into a distant future.

Recognizing and mitigating potential survey and interview bias
In terms of methodology, this report follows robust research design and protocol. Doing so minimizes potential bias, but does not eliminate it, as it is inevitable in market research. One potential type is social desirability and conformity bias, as the topic of AI receives lots of media and political attention. Response bias, including extreme responding, cultural bias, and acquiescence bias (“yea-saying”), are potential factors as we ask respondents to self-report on their respective companies’ experience. Therefore, while this report follows best practices, some bias is possible.

Nonetheless, with the combination of extensive survey data, interview data, investment data, and expert perspectives, we believe the report provides a solid foundation for an indispensable view of executive experience with and future plans for AI in business.

I don’t see why speaking openly about our ongoing AI initiatives should be a big fuss. What really makes a difference from a competitive perspective is a company’s ability to execute.

— PFA Pension & Insurance

When working with AI initiatives, it is important to focus on key business issues that benefit the whole and not just doing sub-optimization at small scale.

— Novo Nordisk Pharmaceuticals

Rich Data
Which sources of information is the study based on?

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Executive Perspective

Who are the respondents that have contributed to the study?

The data approach used allows us to identify trends across industries and countries based on input from various functional business areas. Consequently, we have captured a range of insights, learnings, and perspectives from both strategic and technical points of view.

Respondents predominantly in senior level positions

To ensure that these insights and perspectives are relevant at the executive level, we surveyed and interviewed high-ranking officers with a responsibility for driving the AI agenda in their respective companies. With 60% of respondents being either part of top management or the executive management team, their input is likely well attuned to the general perspective and overall strategic direction of the companies they represent.

Functional diversity

The respondents cover very different functions, of which the most common are designated AI/digital department, followed by IT, and strategy/general management functions. This functional diversity increases the breadth of the report, with insights and perspectives covering widely different aspects of AI.

Surveyed companies span multiple sectors

The participating companies are spread fairly evenly across seven sectors, with the majority of companies belonging to Industrial Products & Manufacturing, followed by Financial Services, and Transportation, Energy & Construction. Services and Life Science are represented to a lesser extent.

More than 300 participants

Number of participants interviewed and/or online surveyed in the study

Majority hold a top management or executive position

Organizational level of person participating in the study

A combined annual revenue of $2.3 trillion

Participants come from both major listed companies, privately held companies, and in some case relatively small companies. In totality, they represent a combined revenue of approximately $2.3 trillion. Despite covering a significant part of total European business, our selection criteria have also favored more niche oriented companies with extensive AI experience and capabilities.

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277 Companies


Note: Of all contributing companies, 14 chose to be anonymous
Bits and Bytes

What technologies and data solutions are within the scope of the study?

AI can be defined as the ability of a machine to perform cognitive functions which are normally associated with humans. This includes reasoning, learning, problem solving, and in some cases even exercising human behavior such as creativity.

Advanced AI applications are not yet widespread

AI holds the potential to transform business in a radical way given its wide variety of use. Quite simply, business leaders need to understand AI in order to grasp the opportunities and threats the technologies pose.

While companies acknowledge the significant potential of broader, more advanced AI technologies such as computer vision, speech recognition, and virtual agents, they are currently not in common use by companies in Europe. Companies surveyed are currently focused on narrower and more specific use-cases that support existing business. These efforts will undoubtedly help companies build capabilities that are necessary to deploy more advanced AI solutions in the future.

Machine Learning

The most commonly used AI technology among the surveyed companies is Machine Learning. This is inarguably due to its wide-ranging applicability, making it relevant for a variety of use-cases across the value chain. Of the different types of Machine Learning, the most common is supervised Machine Learning, where software is fed structured data and finds patterns that can be used to understand and interpret new observations.

While companies historically have primarily have used internal data for supervised Machine Learning, many have begun exploring the possibility of combining internal and external data-sets in order to produce even deeper insights.

Machine Learning and Smart Robotics were found to be the most useful. It is not clear from the study if this is because they are simply the most common starting points before deploying more advanced technologies, or if they also longer term hold the most wide and significant application potential.

Companies are using a combination of on-premise and cloud solutions

Companies are increasingly using cloud-based AI solutions for both storage and on-demand computing power - 83% of companies reporting using Cloud technology to some extent to enable their AI capabilities. Key benefits of cloud solutions mentioned by many respondents are the flexibility to swiftly scale systems up and down to accommodate changing demand, a variable cost structure, and access to larger data sets. However, many companies are still relying on on-premise solutions, not least due to existing data infrastructure.

Companies are using a mix of Data Sources and Storage

Solution: How are you primarily dealing with the computing demands needed for AI?

Data Source: 1. Are you currently using unstructured or structured data types in your AI process? 2. Are you currently using internal or external data sources in your AI process?

<table>
<thead>
<tr>
<th>Data Source</th>
<th>Solution</th>
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<tbody>
<tr>
<td>Unstructured</td>
<td>Internal</td>
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<td>Structured</td>
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Note: Remaining percent ‘Don’t know’ responses

A broad definition of technologies are included in this AI definition

Technologies included in the definition of AI used in this study:

- Natural Language Processing: Computer interpretation, understanding, and generation of written natural human language.
- Virtual Agents: Computer-generated virtual personas that can be used to interact with people in both B2C, C2B, and B2B contexts.
- Speech Recognition: Enables computers to interpret spoken language and to transform it into written text or to treat it as commands for a computer.
- Smart Robotics: The combination of AI and robots to perform advanced tasks compared to traditional non-intelligent robots.
- Text Analysis: Computational analysis of texts, making it readable by other AI or computer systems.
- Biometrics: Analysis of human physical and emotional characteristics – used also for identification and access control.
- Machine Learning: A computer’s ability to ‘learn’ from data, either supervised or non-supervised.
- Neural Networks and Deep Learning: Machines emulating the human brain, enabling AI models to learn like humans.
- Computer Vision: Given computers the ability to “see” images similar to how humans see.
Follow the Money

How much is invested in AI in Europe?

A few big AI transactions
influencing the overall picture
Company AI investments in mUSD and
transaction volume per market
(accumulated 2008-2018)

The acquisition data from numerous
sources enabled us to explore the
European AI ecosystem and gain insigh-
ts into investment activity.

An exponential increase in AI in-
vestment over the past decade
Looking at AI transaction activity
across Europe, there has been a steep
consistent growth trend over the past
10 years, totaling 1,334 transactions
involving AI by 2017 – with a six-fold
increase in activity in the last 5 years
alone. This trend is on track to con-
tinue, with an exponential increase
in interest in AI driving more large
companies to invest in AI or acquire AI
bilities from innovative start-ups. Of
the 15 markets surveyed, some include
one or two transactions that are signifi-
cantly large deals.

Majority of investments in AI from
private equity and venture capital
Private equity (PE) and venture capital
(VC) firms are significantly more ac-
tive investors and acquirers of AI than
large corporates, accounting for 75% of deal
volume in the last 10 years. This is an
indication that AI companies are in the
early stages of high risk/high growth
dynamics. It also indicates that, for
large corporates, acquiring or invest-
ing in external AI businesses in order
to obtain AI capabilities is relatively
limited. This is confirmed by our survey
results where only 10% of companies
are seeking to obtain needed AI capa-
bilities through external investment or
acquisitions, and is also much in line
with what we’re seeing when compar-
ing with the US and Asia.

Investment activity concentrated in
major European markets
It comes as no surprise that a lot of
investment activity is in the UK, France,
and Germany, having attracted 87% of
investment in AI companies over the
past decade. The UK leads significantly
in this regard, with 533 of the total
1,362 AI transactions in Europe. From
an investment perspective, it is also
worth noting that in April 2018, the EU
committed to a 70% increase in invest-
ment in European AI by 2020, suggest-
ing further growth and potential in the
region.

Steady increase in European AI investment
AI companies invested into, transaction volume, Europe (from 2008-2018)**

Note: Several transactions in the dataset did not have publically disclosed deal values, suggesting that actual total values are higher than what’s shown above

*For all of Europe, 34 countries (not just the 15 markets focused on in this report)

**Including governmental investment
Ageas is currently using various forms of AI, while also investigating the potential to use even more. For its daily operations, AI models are used to forecast many aspects of the business. These forecasts are used by Ageas employees to make informed decisions. Ageas currently has over 100 internal predictive analytics projects running or in the pipeline for the coming two years, of which more than 10 have already been implemented into the business.

However, for Ageas the most interesting aspect of AI lies in its ability to process unstructured data. Ageas is also implementing Artificial Intelligence in client-facing areas to respond quickly and accurately, while freeing up employees to focus on the most critical aspects of the business.

Ageas is implementing Artificial Intelligence in client-facing areas to respond quickly and accurately, while freeing up employees to focus on the most critical aspects of the business. The key problem it faces with many AI technologies is their dependence on language. For example, a successful system implemented in the UK cannot be simply transferred and implemented in Belgium or Portugal.

Ageas is a Belgium-based insurance company, employing over 50,000 people globally to serve 39 million customers across 15 countries, predominantly in Europe and Asia. With over 3 million clients in Belgium, almost 1 in 2 Belgian households are customers of Ageas, making it a market leader in life insurance and number 2 in non-life. Its revenue in Belgium was over €5 billion in 2017. Ageas is also a major player in auto insurance and travel insurance in the UK.

Ageas is also a major player in auto insurance and travel insurance in the UK. Ageas is also anticipating going beyond photos to estimate the damage of cars in insurance claims, which frees Ageas from having to send investigators to assess the damage. This application of AI makes the process significantly faster and more convenient for both the client and Ageas. The application of image analytics started in the UK and is now being quickly rolled out to its other markets due to its success.

We also spoke to a range of leading AI experts from business and academia to gain insights into the kind of change which we are on the cusp, and the role AI is expected to play as part of a broader transformational wave.

Ageas is also anticipating going beyond pictures, towards AI that can interpret videos. Furthermore, Natural Language Processing (NLP) is being applied in call centers and will soon play a pivotal role in transforming customer service. Ageas is implementing Artificial Intelligence in client-facing areas to respond quickly and accurately, while freeing up employees to focus on the most critical aspects of the business. The key problem it faces with many AI technologies is their dependence on language. For example, a successful system implemented in the UK cannot be simply transferred and implemented in Belgium or Portugal.

AI is entering the mainstream and here to stay
One thing was clear from the experts we spoke to: as far as the peaks and troughs of hype and technological leaps surrounding AI go, there is no doubt that we are living through a particularly prominent peak, with no indication that the buzz nor the potential will fade away any time soon. In a world increasingly dominated, disrupted and driven by innovative tech powerhouses, large and small, it is no understatement to suggest that AI will be a chief protagonist in the change transcending all elements of business in what has been labelled the Fourth Industrial Revolution.

Business-minded people will drive the transformation
The AI experts confirmed some of the key ingredients necessary for AI in organizations: a combination of domain and technical expertise, the appropriate technology, the right talent, and lots and lots of data. While letting tech-savvy individuals drive innovation is great for building understanding, true transformation will not come until business people start suggesting problems for AI to solve - not the other way round.

Agile culture enables AI
Culture was a recurring theme as well. It can either stifle forward momentum in organizations, or be the silver bullet that enables the potential of AI to be realized from top to bottom.

Some of the experts even argue that it’s not only technical skills that hold up AI projects, it’s also the need for a culture of experimentation. Companies that are more natively digital or have gone down that road understand the value of experimenting and iterating. They don’t think in traditional terms of committing to year-long projects that need to produce specific outputs, but rather to explore and test ideas before scaling.

When it comes to AI, knowledge is power
Expert opinion also seemed unanimous in that most people not directly involved with AI must still have quite a basic understanding of what AI is and what it can actually do. Therefore, the task is to educate and improve understanding, from C-suite leadership teams to employees at the coal face. This also ties in with the importance of partnering to get started and access the expertise needed to use AI. While partnering and collaborating solves the perennial AI challenge concerning the scarcity of talent, the significant cost and substantial benefit that can be gained from AI means that organizations also need to be cognizant of building capabilities in-house for the long-term.

Finally, as AI develops, we are also going to see innovation and expertise spreading outside of the dominant clusters of the likes of Silicon Valley, as governments, businesses and universities increasingly invest in building knowledge, resources and capabilities.

We believe that AI will bring significant disruptions, such as enabling self-driving cars. If cars can become self-driving, why would there be a need for personal insurance?

You need experts that truly know the technological playing field. You have to work with PhDs that understand both technology and semantics. These people are hard to find, they know they are precious on the market and they are typically more willing to join start-ups.

We also spoke to a range of leading AI experts from business and academia to gain insights into the kind of change which we are on the cusp, and the role AI is expected to play as part of a broader transformational wave.

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From the Horse’s Mouth*

*From the highest authority

The full extent of the AI story remains in its early stages. What we do know is that big data, computing power and connectivity are changing the industrial landscape. The opportunity rests in accelerating the digitization of businesses, making them more data driven by building applications that deliver machine-assisted insights.

— Mona Vernon, CTO, Thomson Reuters Labs

In some cases, there is too much hype, but paradoxically, the potential opportunities and benefits of AI are still, if anything, under-hyped. Often, the impact of new technologies is overestimated in the short term and underestimated in the long term, and while there is a lot of noise regarding AI, there’s been a lack of in-depth discussion and analysis of how it’s actually going to transform businesses.

— Nigel Duffy, Global AI Innovation Leader, EY

We believe that every organization is going to have to write their own AI manifesto: what they believe about AI, how they’re going to use or not use data, how they’re going to publish data, and make the consumers of their products and services aware of that. The creation of those manifestos is going to become a gateway to the success of AI.

— Norm Judah, Chief Technology Officer of Worldwide Services at Microsoft

If you have a ton of data, and your problem is one of classifying patterns (like speech recognition or object identification), AI may well be able to help. But let’s be realistic, too: AI is still nowhere near as flexible and versatile as human beings; if you need a machine to read, or react dynamically, on the fly, to some kind of ever changing problem, the technology you seek may not yet exist. Intelligence is a really hard problem.

— Gary Marcus, Founder & CEO, Geometric Intelligence, and Professor, New York University

AI is a general purpose technology, so will eventually affect all industries. However, this impact can be slowed by the lack of data in particular industries. There’s also more innovative cultures inside different industries, that can either drive adoption or prevent it.

— Marc Warner, CEO, ASI Data Science
Role of AI in European Business

There is a lot of hype surrounding AI at the moment, and few doubt its potential. We examine how important is AI compared to other digital priorities and where AI fits on the strategic agenda.

We look at the impact of AI on the company’s core business, as well as adjacent and new areas of business.

We also examine the current AI maturity levels across sectors and markets, the potential drivers for deploying AI, and where AI is applied within organizations, across customer-facing functions, operations, product development, and internal business support.

A Strategic Agenda

Where is the AI conversation currently taking place?

A good starting point to understand how large European companies are handling AI is to look at who in the organization is driving the AI agenda, whether it be the Board, the C-suite, managers, or employees.

AI is particularly relevant at higher organizational levels

From driving strategic considerations at the Board level to being a topic of interest or concern at the employee level, the results are clear: AI is important and resides across all levels at many of the organizations we interviewed.

Only a few companies stated that AI is not currently an important topic at any level of the organization — while the vast majority of companies view AI as generally important regardless of how advanced they are, or how much AI is being considered for deployment in the near future.

Active C-suite and Board of Directors involvement

In 71% of the companies surveyed, AI is already an important topic on the C-suite agenda and across various roles — from cost-focused CFOs looking for efficiency through automation, to CDOs with customer-oriented ambitions as part of wider digitalization efforts, to the CTOs who is often still responsible for a type of AI Center of Excellence.

Companies more advanced in AI tend to have stronger involvement of the C-suite and the Boards of Directors than the rest. They focus less on the technology itself and more on the business problems that AI can address. Relatively speaking, the AI topic seems to not yet having reached the same level of importance at the non-managerial level (employees) than at the top.

Speculating about the reason, it could both pertain to job insecurity and to the fact that AI is still a highly abstract topic for many when it comes to proving day-to-day business value.

26
Among Friends
What is the importance of AI against other digital priorities?

In a business era driven by innovation and tech-led disruption, AI is obviously not the sole priority.

**AI as a digital priority**
When asked on a scale of 1 to 5 how important AI is to the business relative to other digital priorities, the majority of respondents told us that it is about equal. Very few organizations said it was their most important digital priority, or not formalized as a digital priority at all, with the spread of responses leaning slightly towards the upper end of the importance spectrum.

This slant is likely to increase as many companies expect AI to become more important, as the technology develops and use-cases become more clear to companies.

The participating companies are generally in the process of understanding the potential of existing data, including to what extent it can be used, what it can be used for, and how to capture and leverage it.

Furthermore, many of the companies are focused on building the appropriate data infrastructures or modernizing legacy systems as a top digital priority, both being prerequisites for introducing AI into the company. Considering that AI is heavily reliant on data as its fuel, this development suggests that the foundations are being laid for further AI integration in the years to come.

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**AI deployed and managed in a balanced way**
How would you characterize the way AI is being managed in your company? How would you characterize the way AI is being deployed in your company?

---

**Push or Pull**
How is AI predominately deployed into the organizations?

To understand the drivers behind the adoption and deployment of AI in the companies, we took a closer look at how AI is approached in a top down-bottom up management context, and from a functional tech-vs. business driven dynamic.

**AI driven from a combination of top down and bottom up**
Contributing companies are quite evenly split across deploying AI as a top down process, as a bottom up, or as a combination of the two. However, when looking at the self-reported most advanced companies, they are more top down than bottom up in their approach. It was clear from speaking with them, that this is partly a result of AI being increasingly important enabler in the company, and playing an increasingly significant role in the overall strategy.

**AI driven from a combination of technology push and business pull**
According to a large part of the companies and despite still being a technically complex thing that requires many specially skilled employees, AI is most often deployed as a combination of business pull and technology push.

This resonates well with one of the most consistent inputs from the executives on the most sought after AI profiles which centered in on the hybrid profile that understand the business needs and the ability to match them to the technological possibilities.
Ready, Set...
What is the maturity of AI in different sectors?

While working with AI should be considered a continuous journey, the AI maturity of surveyed companies provides a tangible indication of the level of advancement of current initiatives.

**Multiple use cases, limited scalability and advanced use**

The majority of companies have begun exploring use-cases, while some companies have made early investments with the intention of taking a leading position in AI. The levels of advancement also vary in that some companies are focusing on narrow use-cases to support their existing business, while others are taking an explorative approach. Among the small group of companies with no or only little AI activity to date, several respond that they are planning to drastically ramp up efforts soon.

**Technology immaturity and internal data quality are key obstacles**

Many companies that have already implemented AI initiatives in their businesses are seeing tangible benefits. Consequently, many of them are exploring more use-cases and structuring their learnings from previous AI projects into a modus operandi that can speed up new initiatives.

Meanwhile, a substantial number of companies have intentionally chosen to take a ‘follower’ position, reporting the perceived immaturity of AI technologies as a key reason. Another reported obstacle to rolling out broader AI initiatives is rooted in data and data infrastructure, where companies have separate projects aimed at improving the structure of existing data, collection of new data, and data access in general. However, the trend is clear: AI maturity is on the rise as adoption of new data, and data access in general. However, the trend is clear: AI maturity is on the rise as adoption of key technologies accelerates and internal capabilities grow.

The vast majority of European businesses are currently either conducting pilot projects to test selected use-cases, or have commenced implementing AI in the business. When talking with executives, it is evident that many companies are struggling with how to integrate pilot projects into daily operations.

**Clear sector patterns, with TMT, Services, and Finance on top**

Companies currently leading the way in terms of AI maturity are in TMT, Services, and Financial Services. Companies in those sectors graviate towards grading their AI maturity as ‘Released’ (AI in active use, though selectively or not with very advanced tasks), or ‘Advanced’ (AI actively contributing to many processes and enabling advanced tasks). A logical explanation for the maturity in TMT and Finance is their tendency to be digitally advanced and more savvy with analytics, favoring these companies to progress beyond piloting by having data science capabilities in place to evolve towards more advanced AI stages.

**Infrastructure and IP with relatively many projects in ‘piloting’ phase**

The Infrastructure and Industrial Products sectors both stand out as having no companies responding that they are ‘Advanced’ in AI at this stage.

**Life science and CPR have fewest released projects**

Consumer Products & Retail companies have a broad spread in terms of AI maturity, where 25% state they have no plans at present for how and when to use AI – much higher than other sectors – while others in the same sector are already at the ‘Released’ or ‘Advanced’ stage of AI maturity. Several companies in both Consumer Products & Retail and Services & Hospitality cite the challenges of knowing what relevant AI technologies are available, utilizing unstructured data, as well as affording the payback period where there may be large upfront costs and undetermined returns on investment.

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**We have multiple sources of ideas for AI. They can come from the business but also from data science teams presenting different possibilities in a proactive approach, as these are new skills within the company. At the end, there has to be agreement between both groups to sign off on AI projects.**

—Tetra Pak
Food processing and packaging

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### TMT Sector with largest percentage of companies that are either released or advanced

How would you describe your company’s general AI maturity? Sectors arranged by maturity based on Advanced and Released
AI Maturity Curve

Majority of companies are in the ‘Piloting’ or ‘Released’ stage

We asked companies to self-report their current AI maturity level, grading themselves at None, Planned, Piloting, Released, or Advanced - as defined below.

LEVEL OF MATURITY

Advanced
AI is actively contributing to many processes in the company and is enabling quite advanced tasks.

Released
AI is put to active use in one or a few processes in the company, but still quite selectively, and/or not enabling very advanced tasks.

Piloting
AI is put to active use, but still only in early stage pilots.

Planned
AI is being planned, but not yet put to active use, not even in early stage pilots.

None
Not yet thinking about AI.

15 European markets
State your Business
Where is AI currently deployed across the companies’ value chains?

Looking at the business functions that most commonly use AI provides a good indication of where companies are placing their bets. These functions are driving the company AI agenda, influencing the future direction of the company’s AI efforts.

Many AI in R&D and IT/Digital functions
On top of an expected high prevalence of AI within IT departments, AI is also commonly used within R&D functions. This primarily comes down to three factors: employees in R&D are often engineers who tend to have a good understanding and appreciation of AI; the R&D function is often already wired towards taking an experimental, agile approach which is key to AI; and the R&D function often sits on significant amounts of useful data leading to high potential use-cases.

Online customer interactions generating front-end data
Customer-facing, commercial functions such as Marketing, Sales and Customer Service are also heavier users of AI, partly driven by their digitization levels. Although AI is generally adopted more slowly in customer facing interactions than in back-end functions, the abundance of data from increased use of online channels is expected to make these functions obvious candidates for AI technologies in the future. Operations and back-end functions use AI to increase efficiency by automating processes and informing decision-making. The key enabler is data infrastructure, and many companies – currently limited by legacy systems and processes that impede capture and retrieval of data – need to upgrade their infrastructure.

Limited use in HR and Procurement
There are several functions where AI is hardly in use among the participating companies. This includes people-intensive functions such as HR and Procurement. This is not due to lack of potentially valuable AI use-cases, which in the case of HR include talent acquisition avoiding human bias, onboarding (Q&A), performance evaluation (analyzing data), etc. but rather seems to be a result of prioritizing other functions and priorities first.

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We can increase productivity, increase our service level, provide new values, transform the way we work and interact with customers and suppliers. AI is an opportunity to offer smarter solutions than competitors and increase market relevance.

— Walter Group
Logistics and supply chain

AI most commonly applied in IT & R&D functions
Which of your company’s business functions currently use AI?

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— Walter Group
Logistics and supply chain
The European AI Landscape

We take a look at how important the digital transformation agenda is on the highest executive level vis-à-vis other strategic priorities. We dig deeper to understand whether digitalization is primarily a key lever to improving and sustaining the current core business, or rather a lever for building tomorrow's business focusing on adjacent or even entirely new business areas. And we summarize how progressed the companies are on their overall digital transformation maturity journey.

Business Benefits and Risks

As a number of industries are beginning to reap the benefits of AI, we investigate what AI is actually doing for businesses today and what is expected in the future.

We look at how big an impact executives expect AI will have in terms of driving growth or causing disruption in their industry, and examine AI’s basic and more advanced uses - highlighting examples of these functionalities in operational mode.

We also present a strategic approach to understanding AI’s four benefit domains from a business perspective, summarizing the value executives expect to generate by using AI, and touching on what business leaders see as the most prevalent business risks.

TomTom

For TomTom, the constant need to revise its comprehensive digital maps that are delivered to its customers on a weekly basis means that the question is how quickly, not whether, it can integrate AI into its operations. TomTom now makes up to 1.5 billion updates to its digital maps a month in its efforts to support its customers in a world that increasingly relies on digital maps as accurate representations of reality. The challenge of updating its digital maps is concerned with volume, quality and lead time – in other words needing to make lots of accurate changes as quickly as possible. With 570 updates made every second, this would not be possible without TomTom’s human teams working in partnership with very efficient, increasingly intelligent software.

The changes made to TomTom’s digital maps include a complex mixture of geometry and road features, from points of interest and altered road junctions to new addresses and traffic signs. With laser radars on its fleet of mobile mapping vehicles, community input from hundreds of millions of users globally and GPS probe data from 550 million connected devices, TomTom’s employees work with AI to leverage this wealth of data in its mapping products. What used to require thousands of hours of manual interpretation is now increasingly automated, meaning TomTom employees can be dramatically more productive in updating the platform.

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What next?

AI is set to play a crucial role in the near future as an enabler of accurate and scalable data processing, with an ultimate aim of real-time updates to TomTom maps. This will help TomTom offer its users a safer and more comfortable driving experience. Further, with a growing number of sensors and devices on vehicles everywhere, this exponentially growing volume of traffic data, paired with increasingly powerful processing solutions, can bring TomTom’s technology a step closer to enabling safe autonomous driving vehicles.

We process and interpret trillions of data points - when all cars on the A1 highway suddenly move 30 meters to the right, then the road has probably been changed.

We don’t see any limitations due to regulation at the moment. However in our branch where we are collecting data, regulations are a very important topic.

TomTom is one of the global leading navigation solutions companies, offering navigation products, software and services. The company is headquartered in the Netherlands, where it is listed on the Amsterdam stock exchange. TomTom has more than 4,500 employees around the globe. In 2017, TomTom had €903 million in revenue, of which 46% stemmed from consumer products, 36% from automotive & enterprise, and 18% from telematics. The majority of TomTom’s business is in Europe, in which it is the market leader.

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Another World

What is the expected impact from AI within the next 5 years?

Of the surveyed companies, 81% believe that AI will have a high or significant impact on their industry within the next five years. Digging deeper into the data, many of these companies expect AI to fundamentally change their competitive landscape, driven by increasing risk of competition, including from new types of start-ups and companies from adjacent industries. The majority of companies also believe that AI will play a key role in their efforts to continuously cut costs to stay competitive.

Strongholds and premiums to change as AI gains ground

Many companies expect competition to intensify due to the ‘winner takes all’ dynamic often associated with the massive scale that AI and digital can create. They also expect significant impact on their products, increasingly in the form of new services, and they believe the speed of developing new products and taking them to market will drastically decrease - making current competitive strongholds less viable in the long-term.

This is particularly clear in R&D intensive sectors such as Pharma, where big data sets and intelligent algorithms to speed up the drug discovery process (10x mentioned as realistic) can impact the dynamics towards existing peers, while new AI based entrants (e.g., intelligent devices) can influence how premiums are distributed in future value chains.

Across sectors, executives expects significant impact

Services comes out on top in the ‘High Impact’ category, but all sectors expect a significant degree of impact from AI. An overwhelming share also anticipate that AI will result in entirely new products, services, and business models.

Companies from Industrial Products and CPR expect relatively least ‘high’ impact from AI, but even in these sectors, more than 30% expect the industry to be disrupted.

Limited sync of maturity and expected impact

The biggest disparity is within Finance, specifically Pension and Insurance where ambitious companies are making significant investments in building data infrastructure and AI capabilities, while others are taking a waiting stance, and will jump on the AI train when the technology is more mature.

In the opposite end of the expected impact scale, Ireland, Austria, and Spain, in that order, are the countries where most companies expect only ‘some’ impact from AI or less.

Some country variation with regards to expected impact from AI

When approaching impact from a country perspective, the tendency remains; there are very high expectations across the board. Sweden, Switzerland, and Italy are the countries where most companies expect ‘significant’ or ‘high’ impact from AI. Although Portugal stands out as the country where the largest share of companies expect ‘significant impact’ from AI, the result is very different if consolidating with the ‘high impact’ expected category as well.

In the opposite end of the expected impact scale, Ireland, Austria, and Spain, in that order, are the countries where most companies expect only ‘some’ impact from AI or less. Noticeably, Finland has the lowest share of companies expecting ‘significant impact’. As with Portugal, the result is very different if consolidating with the ‘high impact’ category.

Services the sector with the highest expected impact from AI

How much impact do you expect AI will have on your industry within the next 5 years?

High expected impact from AI consistently across countries

How much impact do you expect AI will have on your industry within the next 5 years?

Every industry and every aspect will be affected by AI. At least for machine learning, it is like statistics on steroids and shown to be very powerful. There is a risk that many business areas will be disrupted fully. But this is also the opportunity.

— Postnord postal services
## AI Here, There, Everywhere

**What is the proximity of AI’s future impact to core business?**

<table>
<thead>
<tr>
<th>Companies expect impact across all horizons</th>
<th>To what degree do you expect AI will create impact for your company within each of the following areas?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Core Business</td>
<td>1% Not at all; 4% To some degree; 29% To a very high degree; Avg. Score 4.0</td>
</tr>
<tr>
<td>Adjacent Business</td>
<td>1% Not at all; 7% To some degree; 31% To a very high degree; Avg. Score 3.7</td>
</tr>
<tr>
<td>New Business</td>
<td>3% Not at all; 10% To some degree; 22% To a very high degree; Avg. Score 3.5</td>
</tr>
</tbody>
</table>

Many of the participating companies are expansive, with diversified business units offering a range of products and services. We questioned where they expect AI to have an impact – in their core, adjacent and/or new business.

### AI will impact across the board, but less consensus on timelines

Companies expect AI to have a relatively equal impact on core, adjacent and new areas of their business. In interviews, they say impact depends on the timeline, for instance AI impacting the core business now, but adjacent and new business later on. The range of answers for “Adjacent” and “New” across Europe are more split and contain more “Don’t Know” responses than for “Core” – perhaps because there is an inherent challenge in making predictions about AI’s impact on new business areas where business results are not yet realized, and where the role of current and upcoming AI technology is not clear.

Yet, interestingly 32% feel confident AI will impact areas that are “entirely new to the company.” This is far behind the 37% of respondents who expect a very high degree of impact on the core areas of the current business.

### A.P. Moller – Maersk

There is no doubt that AI has the potential to transform Transportation & Logistics, giving rise to a new class of intelligent logistics assets and operating models. Data science is not new to A.P. Moller – Maersk, yet only recently has AI become a part of Maersk’s core strategy as a functional technology with tangible applications. As a designated new discipline positioned close to the core of group strategy, Maersk is developing AI capabilities as part of a broader transformation of the business.

### As a designated new discipline positioned close to the core of group strategy, Maersk is developing AI capabilities as part of a broader transformation of the business.

Maersk takes a broad view of AI, applying intelligent technology to three main areas: product offerings, (using AI to develop new products and services and improve existing products and services); enhanced customer experience (service delivery, issue resolution, empowering customer-facing employees); and operational efficiencies (for example via network optimization).

### What next?

A.P. Moller – Maersk is a Danish conglomerate with activities in two sectors: Transport & Logistics and Energy. Maersk is the largest company in Denmark, and the world’s largest operator of container ships and supply vessels. The company has approximately 88,000 employees, a fleet of more than 1,100 vessels, and subsidiaries and offices in 130 countries. Its 2017 revenue was $31 billion.

Treating AI as a distinct part of wider digital initiatives, Maersk established an in-house software development and innovation unit, consisting of 100 employees and growing. The aim is to deliver AI products and solutions rooted in the group business strategy, building on well-defined use-cases with deep sponsorship from the business, thereby avoiding the trap of living separately from the business and not adding value.

Maersk’s early investment in agile transformation and people capabilities has resulted in the organizational structure and concentration of talent necessary to drive AI forwards in a large global organization.
AI enables a wide range of uses, broadly split into personalizing, automating, predicting, prescribing and generating insights. We asked companies how relevant each was to their business and found a significant degree of variance in terms of what executives expect to use AI technologies for.

**Prediction is the top use**

With 74% of companies seeing prediction as a relevant use of AI, this functionality, which includes churn analysis, predictive analysis, and predictive maintenance, comes out as the top use. Companies with a large customer base use churn analysis to identify and proactively engage customers with exit potential. Sales teams use predictive analysis to identify leads with the highest likelihood of conversion. Companies that sell or use advanced costly machinery use predictive maintenance to save money through decreased downtime.

**Intelligent automation for effectively dealing with routine tasks**

Smart automation is seen as widely applicable by 74% of companies surveyed. With estimates that 20-30% of current tasks can be done without human intervention, a substantial number of companies are currently in the process of training chatbots to transform the way information is acquired.

**Generating insights to make informed decisions**

Focusing on generating insights based on internal and external data, 58% of companies view AI as a way to make better decisions. This requires a sophisticated data infrastructure. Companies reliant on R&D are using AI to speed up the process of analyzing data for new product development and to inform future research.

**Personalization is becoming a common feature**

Among the surveyed companies, 44% are using AI to personalize the user experience, for instance by tailoring content to individual interactions as an effective way of driving mass-personalization. Next steps in personalization include chatbots and virtual assistants, where some companies already have fully automated customer front-end solutions in place.

**Prescriptions’ potential is big**

Prescription is the laggard among the five AI uses, with current use-cases typically being early stage, such as suggestion engines and decision recommendations for salespeople and advisors. AI for advanced prescription such as complex decision making lies in the future, as it requires collecting large amounts of data and understanding which variables are significant, including some that are difficult to digitize.

**Use It or Lose It**

**How is AI put to use in companies today?**

- **Predict**
  - Anticipate events and outcomes
  - AI will help make our products more reliable and allow real predictive actions based on various data sources.
    - Siemens (Mobility Division) Mobility solutions

- **Automate**
  - Handle tasks without human intervention
  - In the manufacturing industry, all processes will be impacted through the expanded use of AI. They will be simplified, automated and improved. AI will have an impact on the industry business model, from product-oriented to platform/services-oriented.
    - Carmeuse Mining

- **Prescribe**
  - Suggest solutions to defined problems
  - We use Natural Language Processing to group customer inquiries and suggest which of our 300+ templates we should use in response. Our employees only need to confirm the choice or tweak it slightly. This dramatically lowers the time it takes to respond.
    - PFA Pensions and insurance company
Making AI Simple

What is a good framework to map the potential benefits from AI?

The contributing companies generally expect to benefit in all four key domains as outlined in Microsoft’s Digital Transformation framework: optimizing operations, engaging customers, transforming products and services, and enabling employees. Each domain draws on underlying AI functionalities – ‘reasoning’ through learning and forming conclusions with imperfect data; ‘understanding’ through interpreting the meaning of data including text, voice, and images; and ‘interacting’ with employees, customers and other stakeholders in natural ways.

Applying AI to these domains can be transformational to a business, ultimately changing the landscape of the business itself and the industries and ecosystems in which it operates.

Let’s look in more detail at what that entails.

Improved production and efficiency through optimized operations

While digital transformation in general is based on customer engagement, optimizing operations is what companies first look to when putting AI to use. It draws on multiple levers such as: intelligent prediction, e.g., identifying chronic diseases, anticipating non-performing products, or adaptive modelling to flag corrective actions; operational efficiency, e.g., optimizing forecasting and order-to-fulfilment flows across the value chain, or processing huge sets of documents in a fraction of the time; and deep insights, e.g., detecting anomalies to surface irregularities such as fraud, or identifying new pockets of opportunity before competitors do.

Enabling employees to be more efficient and capable

Across sectors, numerous AI use-cases focus on increasing employee productivity or serve to enhance the human ingenuity and the ability to fulfill a given function. AI helps employees in B2C companies expand organizational knowledge by analyzing vast customer behavior datasets in order to adapt online and offline store layouts, driving conversion and sales. Customer personalization is used at scale, powered by AI solutions that reveal real-time customer insights, identifying the best next actions for upsell and cross-sell opportunities, as well as predictive models that obtain a 360-degree view of the customer by integrating customer data and sentiment to generate targeted offers.

Engaging customers more effectively through AI

After optimized operations, companies look to customer engagement as the domain in which to seek most business benefits. Early examples of AI applications in the customer engagement space involve levers such as conversational agents, e.g., bots providing personal recommendations and transactional advice, personal assistants, e.g., guiding decision-making, shortening conversion cycles, and self-service, e.g., options to help customers reduce time to resolution.

Staying ahead of the competition by transforming products and services

Transforming products and services, and enabling employees, came out on the same level, slightly below the two other domains when it comes to where companies expect to generate future business benefits. Transforming products and services, ultimately giving rise to entirely new business models, is mostly favored in R&D-heavy sectors where companies consider AI and advanced analytics as levers to speed up the product innovation and discovery process. In B2C-oriented sectors, AI enables provision of new services via multilingual cognitive tools, geo-location suites, sentiment analysis, cognitive robotic advisory capabilities, personalized service agents and more to transcend the sectors to a new level of value-add – with significantly increased scale and reach in real time.

It is important to invest not because of hype, but where it provides business benefits.

— Schindler Manufacturing

Artificial Intelligence impacts business in four benefit domains

Companies must consider how they approach the benefit domains in their AI strategy formulation:

1. Engage your customers
   - E.g., provide customers advice, shorten conversion cycles, and reduce time to resolution

2. Improve your products & services
   - E.g., speed up product innovation cycles, enable new value-add services, and provide real-time support

3. Enable employees
   - E.g., increase employee efficiency through predictions, enabled support, and automation of repetitive tasks

4. Optimize your operations
   - E.g., improve planning and reduce costs through intelligent prediction, operational efficiency, and deep insights, predictive maintenance

Business Benefits and Risks
Where Value Hides

What benefits do business leaders particularly expect from AI?

Respondents were asked to assess the potential of AI within each of the four benefit domains.

Optimizing operations and engaging customers to deliver most value
Among all companies surveyed, 89% expect AI to prove beneficial in optimizing operations, with use-cases most highlighted by executives being monitoring results, predicting trends, and prescribing future solutions. A lot of focus is given to intelligent automation, such as making compliance cheaper and more robust, improving risk analysis, optimizing supply chains, providing predictive maintenance capabilities, and more.

Not surprisingly, the ability to structure repeatable processes and reduce human error and bottlenecks is something most executives can get behind from a cost-saving perspective. 74% of companies surveyed expect AI to help them engage customers and enhance the user experience, including tailoring content, increasing response speed, adding sentiment, creating experiences, and anticipating needs.

Fewer expect products and services and employee engagement
Although executives speak of the potential in making sense of existing and new sources of data to introduce higher margin services to product portfolios, expedite new product development, and introduce innovative new offerings, only 65% expect AI to help transform products and services.

Even fewer (60%) expect AI to provide benefit from empowering employees to improve productivity, enable innovation, support problem solving, etc.

What we did hear overwhelmingly, however, was the importance of bringing all employees along on the company’s AI journey. This involves getting internal buy-in that AI will be a force for good, generating excitement about working with intelligent technologies, and making existing jobs easier and more engaging.

Most companies expect to generate benefit from optimizing operations

What business benefit do you expect AI to generate?

- 89% Optimizing operations
- 74% Engaging customers
- 65% Transforming products & services
- 60% Empowering employees

Business Benefits and Risks Artificial Intelligence in Europe

What next?
One major future focus of AI use in Stora Enso is predictive maintenance. The machines started to be automated in the 1970’s, but the schedule for their expensive maintenance breaks has not changed much since then. With predictive maintenance solutions, machines could be stopped only when the maintenance is actually required and not simply because it has been a year since the last one. Further, Stora Enso expects that AI resources will be further decentralized in the future and that new applications will be found, both for business functions and to develop new products and services.

Stora Enso is one of the oldest corporations in the world (with a history dating back to 1288) and is a leading provider of renewable solutions in packaging, biomaterials, wood constructions and paper on global markets. Its customers include packaging producers, brand owners, paper and board producers, publishers, retailers, point of sale converters, and joinery and construction companies. Its aim is to replace fossil based materials by innovating and developing new products and services based on wood and other renewable materials. Stora Enso employs some 26,000 people in over 30 countries.

The group leadership is aware of the possibilities of AI and AI projects are given sufficient resources.

Stora Enso believes that AI will make it more agile and adaptive as a whole. The more they have systems that can automatically adapt to changing situations, the quicker they can react to them. AI will be most visible in operations and logistics because of massive amounts of data. Although the focus of Stora Enso has been in optimizing the current business model, there have been some initiatives in new services, such as intelligent packaging initiatives that collect data which can be further analyzed and sold to customers or other players in the supply chain.

However, before AI can be exploited to its full extent, the processes and particularly the master data must be suitable. Currently, data is not all in the same place, and Stora Enso has an ongoing project to consolidate it.

We think AI is one of the most important digital initiatives at Stora Enso.

We are finding ways to exploit AI in all areas of our business.

The group leadership is aware of the possibilities of AI and AI projects are given sufficient resources.

Business controllers will have data analytics training organized together with Aalto University Executive Education.

Stora Enso

There is strong support for AI within Stora Enso. The group leadership is aware of the possibilities of AI and AI projects are being given sufficient resources. Digital and AI capabilities form Stora Enso’s Digital Office, which supports the projects within business divisions and functions. However, some of the functions also have their own digital and AI capabilities so that they are able to exploit AI fully with domain expertise. Finance has its own RPA & Data Analyst teams, although they cooperate tightly with the group-wide digital unit. Stora Enso has a target to train 1,000 employees in AI so that they are able to identify its possibilities in the business.

Stora Enso employs some 26,000 people in over 30 countries. (Case Study)
Executive surveyed and interviewed in the various sectors recognize the distinct benefits of AI, speaking about the myriad of ways they see AI transforming their businesses and industries. Although there are clear patterns to discern, executives from different sectors often speak to different benefit areas from which they particularly hope to capitalize from.

**Services companies expect the most benefits from AI**

Services companies reported the highest expected benefits across all four domains, expecting significant value from AI through engaging customers and empowering employees, for example via improving resource and skills allocation across their large human capital pools. (Note: the Services sample is the smallest of all sectors.)

**Expeditied drug discovery and disease prediction in Life Science**

Executives in Life Science are among those most excited about benefits pertaining to transforming products and services. Many see AI leveraging existing internal and external datasets to speed up the drug discovery process and enable the transition towards precision medicine.

Deep learning with huge datasets is also expected to assist with disease prediction. Customers can be engaged using new health-oriented IoT-related wearables, paving the way to valuable data collection and even entirely new business models.

**Engaging customers in new ways in Consumer Products and Retail**
The Consumer Products and Retail companies we spoke to rank lowest in terms of expecting benefits from AI, pulled down by only 44% expecting benefits from AI to empower employees. However, with multilingual cognitive tools and being able to bring targeted, tailored offerings to customers, many spoke of the potential to engage customers, and of using AI for crucial activities such as understanding brand performance and sentiment analysis.

**Front to Back**

**What are the expected benefits by sector?**

As a railway company, we have significant physical assets that need to be maintained. With AI we see significant opportunities, like automatically detecting faults in railway tracks and predicting maintenance needs. This improves not only efficiency but also security.

— SBB Swiss Federal Railways

Railways
Today AI is often somewhat a ‘black box’, however we need to know why AI came up with a certain conclusion, such as telling a customer why their loan application was declined or similar. Trust in AI is lacking, so there is a risk that customers remain on the fence with regards to the application of AI.

— KLP Banken Bank

Use cases where we got the best results were when we had a strong lead on the business side to coordinate the work and act as ‘data translators’ between the data scientists and their own colleagues.

— Proximus Telecommunications
Learn from the Leaders

The promise of AI lies in creating business value.

We have identified the eight most recognized capabilities needed to successfully create value from AI, and assessed how competent companies are within each.

Perhaps more importantly, the executives we spoke with highlighted the importance of these 8 competencies as those needed to successfully create value from AI.

Capabilities. How?

What competencies are required to get AI right?

This section explores the necessary eight capabilities to develop AI maturity, realize tangible business benefits, and minimize risk. As exhibited in the chart on the following page, we asked companies to rank the importance of these capabilities in terms of incorporating AI into their business, as well as to self-assess how competent their companies are with regards to each AI enabling capability.

The human element and technology

Some of the eight capabilities center around human elements: AI Leadership; Open Culture; Agile Development; Emotional Intelligence. Others are more technology oriented: Advanced Analytics; Data Management; Emerging Tech; External Alliances.

Ranking of key capabilities for realizing AI potential

Advanced Analytics comes out on top as the most important AI enabling capability among the companies surveyed. Data Management is second. AI Leadership is perceived as the third most important capability. Open Culture refers to collaboration and the ability to embrace change and uncertainty.

Understanding how to deploy the right Emerging Technologies in a future proven way is ranked fifth, followed by Agile Development, where self-organized teams are characterized by shorter project cycles, the ability to work with constantly evolving technology, and transparency regarding success and failure that leads to wider buy-in and scaling.

Entering into External Partnerships ranks second to last in terms of importance, perhaps because it’s the area that resonates most with existing capabilities and where business leaders perceive themselves most in control. As the majority of companies we spoke to are looking to supplement their in-house skills with external partners when building their AI solutions, particularly for pilot projects, it is not due to a general lack of relevance.

Bringing behavioral science into play via Emotional Intelligence to build solutions that understand and mimic human behavior, and make it easier for humans to interact with the technology, is seen as the relatively least important AI enabling capability. An explanation for this could be that the technical skills are still so relatively complex for companies to grasp and establish, that more advanced human cognitive skills become less of a priority at this stage.

Noticeable sector deviation

As exhibited in the following chart where business leaders are asked how competent their company is in relation to the most important AI enabling capabilities, the sector aggregate scores land at or just above the median, with a fairly close spread. Sectors that are more mature in using AI are those that report higher competency in Advanced Analytics—particularly TMT (Telecom, Media/Entertainment & Technology), as well as Finance (including Banking, Investment & Insurance), and Life Sciences (including Healthcare & Pharma) all report lower competency in AI Leadership. A possibility is that in the pharmaceutical industry, AI chiefly resides in R&D, and has yet to affect the broader organization on the wider strategic level.

Companies intend to use various levers to obtain these AI capabilities. Companies are relatively evenly split between using recruitment (60%), training (56%), partnering (57%). Only 10% of the companies use acquisition of teams or businesses as a way to fast-track building much needed AI capabilities.

8 capabilities

1. Advanced Analytics
   Obtaining and deploying specialized data science skills to work with AI by attracting talent and working with external parties

2. Data Management
   Capturing, storing, structuring, labeling, accessing and understanding data to build the foundation and infrastructure to work with AI technologies

3. AI Leadership
   The ability to lead a transformation that leverages AI technology to set defined goals capture business value and achieve broadly based internal and external buy-in by the organization

4. Open Culture
   Creating an open culture in which people embrace change, work to break down silos, and collaborate across the organization and with external parties

5. Emerging Tech
   The organizational-wide capability to continuously discover, explore and materialize value from new solutions, applications, and data platforms

6. Agile Development
   A methodological approach in which collaborative, cross-functional teams work in short project cycles and iterative processes to effectively advance AI solutions

7. External Alliances
   Entering into partnerships and alliances with third-party solution providers, technical specialists, and business advisors to access technical capabilities, best practices, and talent

8. Emotional Intelligence
   Applying behavioral science capabilities to understand and mimic human behavior, address human needs, and enable ways to interact with technology and develop more human-like applications
AI Competency Model

Advanced Analytics and Data management considered most important AI capability
How competent is your company within these organizational capabilities?

Note: ‘Don’t know’ answers not included in average score.
Average competency and importance for 15 European markets (1: lowest – 5: highest).
Capabilities ranked according to highest importance in 15 European markets.

TMT leads the other sectors in AI competency
How competent is your company within these organizational capabilities?

Note: ‘Don’t know’ answers not included in average score.
Average competency by sector (1: lowest – 5: highest).
1. Advanced Analytics

Obtaining and deploying specialized data science, data engineering, data architecture and data visualization skills by training employees, attracting talent and co-creating with external partners

The backbone of AI is made up of skilled, intelligent minds who are capable of understanding business problems at the granular level, and deploying AI to effectively solve or support others in solving these problems. This requires technical data science and mathematical engineering skills, to hybrid profiles with sufficient business acumen to decode problems and ability to tackle them using quantitative methods.

A self-fulfilling talent prophecy

It is evident from the study that there is a major lack of technical data skills to meet the drastically rising demand for AI. As a result, the hunt for AI experts has become extremely competitive, and it is far from uncommon that functional AI experts are paid higher salaries than their superiors are - in some cases leading to new HR policies to reflect evolving requirements.

Several business leaders state that the lack of AI talent is the greatest barrier to implementation within business operations. Interestingly, companies that have chosen an early adopter strategy for AI have been successful in attracting senior professionals who again have been able to build out sizeable AI teams in their companies – based on the premise that talents seek talent – making AI recruitment a self-fulfilling prophecy for these pioneering companies.

In other words, the longer you wait, the harder it can be to get the right people. Consequently, a ‘wait-and-see’ strategy can be risky for companies that are AI followers due to the scarcity of talent, which may prove impossible to attract once the company is ready to make a more ambitious move into AI.

While many companies struggle with acquiring AI talent, we also experienced companies - even in traditional industries such as Transportation and Industrial Products - with AI teams of +25 experienced data scientists holding Ph.D’s in mathematics, astrophysics, etc., from high profile universities. Most often, these companies have been first movers on AI and attracted senior practitioners tasked with building out sizeable AI communities to work on the most strategic business agendas.

Hybrid profiles becoming the hardest currency

One of the most consistent inputs from the executives was the need for people with deep domain knowledge combined with strong technology proficiency. This hybrid profile is essential to identify relevant use-cases in the business with possible AI solutions.

Contrary to data scientists, software engineers, and even data architects that can be recruited externally, the hybrid profile is often nurtured by training existing employees from the line of business and adding AI skills. To succeed however, a fundamental appreciation for technology is required.

Co-creating to compensate for blind spots - while avoiding the black box

The scarcity of available talent has led companies to increasingly co-create solutions with external partners who bring with them specialized know-how. However, executives very clearly point to the need for internal AI capabilities in the receiving end to understand the real problems and evaluate the performance of external partners.

Companies find that AI solutions implemented by external parties become black boxes unless the organization is capable of contributing and taking over the solutions after delivery. Avoiding black boxes is a general concern among executives. Consequently, internal data scientists must be able to decode and dissect AI applications to explain the underlying rationales.

Such rationales are important in making AI driven solutions creditable, and greatly reduce the risk that an AI application draws wrong conclusions based on false assumptions.

The way we manage and plan operations will change dramatically through data capabilities.

What to learn from AI leaders:

1. Providing interesting problems, good data, and a freedom to thrive in a non-corporate environment is key to attracting talent

2. A wait-and-see follower strategy can prove risky and put companies in a talent scarcity trap.

3. Training existing staff with deep business intrinsics is key to make AI work - and effective when access to talent is challenged.
2. Data Management

Capturing, storing, structuring, labeling, accessing and governing data to build the foundation and infrastructure to work with AI technologies

Companies tend to focus their AI efforts in areas where they already have relevant data. We found that the amount of available data varies significantly by sector but regardlessly, a significant proportion of the time companies dedicate to AI is spent on data management related tasks.

Data governance is no trivial task
One of the major hurdles companies face regarding data is governance, particularly who ‘owns’ it, how data is stored, how to access it, and who may access it are all essential questions when working with AI. Questions that used to be about efficiency suddenly become highly strategic and complex to respond to without rethinking governance structure and policy. Governance aside, the most common obstacles to using data are organizational silos or legacy systems built for specific purposes, resulting in decentralized storage that limits access.

Companies reported that they typically spend 2-3 years building the appropriate data infrastructure for AI, and many respondents with the most ambitious AI visions are still spending the majority of their time fine-tuning their infrastructure.

Data privacy regulations
Data infrastructure is not only a prerequisite for effectively working with AI, but is increasingly needed to comply with data privacy regulations, which respondents see as a key risk. The recent implementation of GDPR in the EU has highlighted the need to govern what data is being used for. AI-specific regulation is in many ways still immature, and AI leaders find that a lack of clear guidelines can limit their progress.

Advanced companies (also) appreciate external and unstructured data
To build precise and useful AI solutions, companies not only need a lot of data, but also accurate data that is appropriately structured and labeled. Data is often reported to be in a state that it is simply unusable, as it could lead to undesirable or unreliable outcomes.

While most companies are preoccupied with cleaning, structuring and migrating historical data, some have chosen to build new data structures from scratch to collect the correct data going forward. Interestingly, we found that while companies that are less mature in AI tend to use mostly structured data from internal data sources, a significant 80% of the most advanced companies also use both structured and unstructured data, and an equivalent 80% use data from both internal and external sources.

Similarly, 60% of these self-rated most advanced companies report use of hybrid architectures of on-premise and cloud-based storage, while the less advanced predominantly rely on on-premise platforms.

What to learn from AI leaders:
1. Make sure that the value of data is understood and prioritized throughout the organization.
2. Engage the C-suite in defining data governance and strategy - it is key to getting AI right.
3. Build your data structure to embrace unstructured data, also from external sources - advanced companies indicate that you may soon need it.

An algorithm is as good as the data that supports it. You can make bad analytics by having a bad algorithm but also by using bad data. It is important to get those things in order and have processes and people to make sure that the quality of data is driven and maintained.

— Vattenfall Energy

The ethical use of data is a challenge or risk. Data must be stored properly. The person who generates the data is also the owner of the data, and that person has to decide what to do with it.

— Royal Philips Health technology
3. AI Leadership

The ability to lead an AI transformation from top to bottom - by articulating a vision, setting goals and securing broad buy-in across the organization

As with any corporate transformation, the foundation for successful deployment of AI is executive leadership buy-in and sponsorship. The C-suite must be aligned in what they want to achieve, and AI must be placed on the strategic agenda to ensure that AI efforts are an integrated part of the company’s overall strategic goals, that capital is allocated, and employee time is dedicated.

**AI Leadership among the lowest competency of all capabilities**

Given the relative importance of AI Leadership (avg. 4.2 across all sectors), it is interesting to see that business leaders self-assess their level of competency as among the lowest of all eight AI enabling capabilities, with an avg. competency of only 2.9; 66% of respondents state that their companies have moderate, little or no AI Leadership competency. Many executives are realizing that business acumen is not enough in itself for understanding how AI is impacting the business. As AI technologies become increasingly complex, leaders must be able to launch, support and, where necessary, challenge relevant AI initiatives against strategic business imperatives. The disruptive potential that companies believe AI will have also means that leaders should anticipate and prepare for a broader change management exercise aimed at embracing the change from AI on multiple levels.

**Significant variation in AI conversations from top to bottom**

Interestingly, data revealed that AI is considered an “important topic” on the C-suite level among 73% of the companies surveyed. However, less so on the Board of Director level where it is only considered an important topic in 38% of companies, and even less so on the operational employee level with 28%.

We observed in the interviews that companies very rarely have AI capable leaders across the Board of Directors, Executive Management, and Functional Management layers. Senior AI leaders can sometimes be found on one of the levels, but rarely with any speaking leadership colleagues to challenge ideas. This leadership vacuum was often pointed to as an issue from lower level AI experts.

— EQT

Private equity group

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**What to learn from AI leaders:**

1. The organizational transformation driven by AI will be continuous - this requires seeing AI as a process, not a project.
2. Leadership must be accustomed to AI technologies to understand how it will affect the company.
3. Articulating a clear AI vision is key to achieving buy-in and motivating exploration of use-cases with uncertain outcomes.
4. Open Culture

Creating an open culture in which people embrace change from AI, navigate confidently in uncertainty and ambiguity, work to break down silos, and collaborate seamlessly across the organization

New technologies have often disrupted how work is conducted. AI is no different. Establishing an open, collaborative culture to minimize resistance and enable human performance can prove efficient to prepare the organization for transition. However, this may be difficult, as the magnitude of impact driven by AI can imply a fear of uncertainty, ambiguity, and a general resistance to change.

Risk to employees less of a concern among most advanced companies

Companies reported that employees generally have a positive attitude towards AI. Yet, one thing is having a positive attitude in general, another is to retain an open attitude once new technologies start impacting the way work is done.

To achieve buy-in, business leaders must make the changes due to AI tangible to reduce organizational uncertainty. However, companies expect a significant impact from AI which will drive a fundamental transformation and increasingly assist in tasks previously performed by humans.

Interestingly, the companies that self-rated as most advanced see a lower risk to personnel than the less advanced (only 20% of advanced reported this risk as a concern vs. 43% for the companies still in the “planning” phase).

Relatively small competency gap

With a relatively small gap between importance (avg. 3.9) and competency (avg. 3.2), creating an Open Culture is one of the capabilities where business leaders feel most comfortable.

An obstacle mentioned by many respondents is the ability to work collaboratively across the organization despite AI most often being put to use towards quite narrow use-cases. With benefit areas being limited to specific domains or functions, it is often not seen as relevant to involve the organization in a broad and collaborative approach on AI.

Cooperation across the organization

Many of the most advanced companies that have been able to produce several AI projects have also managed to establish links and cooperation across the organization. These cases indicate that the benefits of an open work culture far exceed the difficulties and associated risks.

An obvious obstacle to an open culture is the fear of job losses with the introduction of AI. According to respondents, the fear of workforce redundancy has some merit, but the concern should not overshadow the significant benefit potential of AI. A pivotal task for company leaders is to proactively articulate a tangible vision for AI initiatives. This will make it easier for employees to understand the AI opportunities on a personal level, and thereby embrace the change ahead.

Most companies rate themselves moderately competent in Open Culture

How competent is your company within creating an Open Culture?

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<td></td>
<td>11%</td>
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Note: Remaining percent are ‘Don’t know’ responses

What to learn from AI leaders:

1. Establish cross-organizational projects to foster collaboration and learning across functions.
2. Ensure employee buy-in by being open and clear about on-going projects and desired outcomes.
3. Ensure that governance structures support collaboration through projects co-owned by AI experts and business leaders.

Essentially the use of AI involves enabling employees and the creation of energy in the organization to fully exploit the solutions. The will of employees to share their knowledge and to be able to recycle it in the rest of the organization is also an essential capability in order to use AI.

— Ageon
Financial services
Evidence of the rapid pace of technological change are plentiful in today’s digital world. What we have seen is that there is a definite correlation between companies that are ahead of the pack with AI and with the wider technological adoption. That AI benefits from being able to identify and implement emerging technology may seem intuitive and obvious, yet finding the right formula is not trivial exercise.

How strong is your tech radar?

With an average score of 3.3, the ability to explore and implement emerging technology is an area where business leaders perceive their companies to be most competent across the eight AI enabling capability areas.

One factor in working with emerging technology also relates to agile development and the ability to trial, test and experiment in iterative, short cycles. This kind of working culture allows companies to work with less stable, untested technology. Enabling innovation requires an outlook from the very top that is proving a real challenge for their AI adoption.

Do you enable or hinder innovation?

While there is some truth behind such stereotypes, we also heard from several executives who are able to build radars that pick up what’s happening in technology domains and applications that this continuous explorative process is serving them well to get an overview of workable AI solutions that could prove successful in production.

Not all that glitters is gold

Despite the need to explore and navigate a tech sea characterized by uncertainty, a recurring theme when interviewing executives is the importance of balancing excitement with new technology and commitment to an innovative mindset, with one foot planted firmly on the ground.

Seeing past the hype, remembering the business model, and not wasting finite resources on every shiny object is also important. In other words, remembering as a leader that while experimenting is crucial, not all that glitters is gold.

The importance of execution

Finally, this capability is also effective execution. Many companies we surveyed across Europe had developed prosperous use cases supported by robust concepts and AI applications - on paper. But technical limitations tend to get in the way of implementation.

Employees with limited technical ability often need upskilling to work with new technology, IT and business may need to work closely together and speak each other's languages to reach common goals. In addition, organizations need to learn to move more quickly and nimbly in this space - whether to complete an acquisition of new tech, to ensure compliance with IT standards, or simply to pair new tech with legacy systems. This ability is often also about speed, not far from the development pace that characterizes the emerging tech itself.

What to learn from AI leaders:

1. Build a radar to pick up on merging tech trends and connect them to market opportunities.
2. Look past the technology hype and remember the business model - it may likely need to change in the not so distant future.
3. Cloud solutions can be helpful to engage with multiple datasets across sources - increasingly a priority to capture value from new pockets.

A big challenge is to follow all the rapid evolutions in the market and match that to the right business initiative.

— DAF Trucks Manufacturing

Emerging Technology is the AI-enabling capability with most ‘Moderately Competent’ replies

How competent is your company within adopting Emerging technology?

How competent is your company within adopting Emerging technology?

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</table>

Not that all glitters is gold

Despite the need to explore and navigate a tech sea characterized by uncertainty, a recurring theme when interviewing executives is the importance of balancing excitement with new technology and commitment to an innovative mindset, with one foot planted firmly on the ground.

Working with emerging technology also relates to agile development and the ability to trial, test and experiment in iterative, short cycles. This kind of working culture allows companies to work with less stable, untested technology. Enabling innovation requires an outlook from the very top of the organization that accommodates longer investment horizons and at times uncertain financial returns. This is particularly key when working with AI technology that, according to the executives, is often not as mature as the digital solutions deployed for other purposes.

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We cannot do AI entirely internally as we do not have the needed resources. There is a risk that we won’t be able to keep up with all developments.

— Raiffeisen Switzerland Bank
6. Agile Development

An experimental approach in which collaborative, cross-functional teams work in short, iterative project cycles to effectively progress AI solutions

Considering that many AI technologies are still in their infancys, working with them is far from plug and play. To overcome this, many of the companies that are successfully working with AI tend to take an agile, iterative approach to projects. Using this approach, these companies greatly increase their ability to explore AI potential due to a drastically reduced project cycle time and dynamic risk reduction. Short project cycles result in project teams receiving constant feedback on what works and what does not, to continuously steer the direction of the project. This creates a process centered on learning and experimentation, helping to build internal knowledge and capabilities.

Most advanced companies deploy top down or via a hybrid model

With an average competence level of 3.2, Agile Development is an area where companies are self-reported to be reasonably skilled. Quickly establishing proof of concept is key to organizational buy-in, and many companies report that an agile, iterative approach helps them build evidence and proof in a fraction of the time it takes for a more traditional project.

This has great significance, as they find that tangible proof of concept instrumental in achieving buy-in and understanding in the wider organization. Efforts to develop proof via agile development processes are often orchestrated by a central unit that collaborates with business units to identify use-cases. Of the most advanced companies, 80% deploy AI into the organization via top down only or a via hybrid of top down and bottom up.

It varies whether these central units take a leading role in pushing the agenda, or instead focus on gathering knowledge and experience from already existing efforts that are decentralized in the organization.

Agility provides the opportunity for informed changes of direction

Taking an iterative approach can also help mitigate risks. Frequent feedback loops allow the project team to better identify, understand, and correct undesired outcomes before the AI application is put into production, potentially doing harm. This flexibility does not only apply to risks, as agile projects can generally use continuing knowledge and experience to make informed changes of direction and avoid the “black box” syndrome.

Contrary to agile projects, ‘big bang’ projects are more destined to fail as they skip the learning process, and lack the important feedback loop pivotal to developing good AI solutions. The world of AI is simply too complex for humans to foresee potential issues, and therefore an agile approach is better.

Companies seem relatively competent within Agile Development

How competent is your company within Agile Development?

<table>
<thead>
<tr>
<th>Competency</th>
<th>Importance</th>
<th>Avg. Score</th>
</tr>
</thead>
<tbody>
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<td>3.8</td>
</tr>
<tr>
<td>Highly competent</td>
<td>37</td>
<td>3.2</td>
</tr>
</tbody>
</table>

What to learn from AI leaders:

1. Agile development is effective in engaging people across functions, fostering collaboration, and bridging tech and business.
2. Iterative processes promotes quick internal learning due to their frequent feedback loops.
3. Fast experimentation with pilot projects and use-case testing can quickly show how to create value through AI.

We totally believe in an iterative, agile process where you have POCs, then train the bot enough, release it and program the next flows, instead of doing a big bang solution that will probably fail as these things are not simply plug and play. Start small and then grow it.

— Com Hem
Telecommunications

Egmont
Media

Learn from the Leaders

Learn from the Leaders
7. External Alliances

Entering into partnerships and alliances with academia, solution providers, and AI specialists to access technical capabilities, best practices and talent

AI leaders are increasingly opening up to create collaborative alliances with external partners, enabling them to tap into a significantly larger pool of capabilities and talent, and to reduce the time it takes to develop or deploy working solutions.

This trend seems to be the new modus operandi, unfolding across markets and sectors. It is also the capability with the smallest gap between perceived importance and competence level among the participating companies.

Technology, data, and service delivery partnerships

Development of AI and delivery of related projects are most often done with a mix of internal and external stakeholders. The rationale is multifaceted—some companies are simply struggling to obtain the needed talent, whereas others see a partnership approach to be a faster, more flexible solution. These external alliances typically come in two forms: being focused on technology and technical AI know-how, or focused on strategy and business development.

To address one of the biggest prerequisites of working with AI, access to large amounts of data, companies state that they are increasingly looking to enter into data partnerships where they either buy or exchange data with other parties. This is a way for companies to get hold of data that they are unable to capture themselves, or simply a way of quickly increasing the size of their datasets.

Others report that they look to pre-developed, out-the-box algorithms, in order to increase the speed of bringing quality solutions in to product.

Academia playing a more noticeable role in collaborating with companies

It is becoming increasingly common for companies to enter into partnerships with universities in order to position themselves within AI and get access to crucial knowledge.

Companies also see this as a way of establishing a pipeline of AI talent already familiar with their business and the problems they face. Some of the more ambitious companies have a strategy of positioning themselves within AI, comprised of active conference participation and multiple university partnerships in which they actually participate in developing courses and programs.

Documentation of code is proving a challenge - also to externals

The lack of code documentation for self-learning algorithms was often mentioned as very practical issue with AI in general. This led some companies to prefer internal teams and individuals in order to ensure that despite poor documentation, the knowledge about the code at least stays inhouse.

What to learn from AI leaders:

1. Make sure to have internal people in the receiving end before widely engaging with external partners.
2. Academic partnerships are an increasingly sought after way to access innovative eco-systems, gain new insights, and explore emerging AI opportunities.
3. Partnerships can pose a challenge to many business processes; consider involving key functions like legal early, to ensure a productive partnership structure and effective collaboration model.

Our way of building our AI capabilities in the company is through innovation. We are innovation driven by the use of start-ups program and trying to develop win-win strategies through partnerships with companies that are not our main competitors.

— Acciona
Infrastructure

We will definitely pursue a partnership strategy. Instead of trying to build everything in-house we will join forces with others to build a strong ecosystem.

— Nilfisk
Manufacturing

Learn from the Leaders

Companies generally consider themselves moderately to highly competent forging External Alliances

How competent is your company within building External Alliances?

<table>
<thead>
<tr>
<th>Competency Level</th>
<th>Importance</th>
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</thead>
<tbody>
<tr>
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</tr>
<tr>
<td>Highly competent</td>
<td>28%</td>
<td>5</td>
</tr>
</tbody>
</table>

15 European markets

Note: Remaining percent are ‘Don’t know’ responses
8. Emotional Intelligence

Applying behavioral science to understand and mimic human behavior, address needs, improve human-machine interactions, and ultimately create more human near applications.

AI has for long focused on cognitive capabilities and skills within mathematics, statistics and logical reasoning. Adding human emotion and intelligence, these capabilities move to a new, more complex level: the understanding of human behavior, and the ability to interact accordingly with technology.

Changing the way people interact with technology
One of the limits of traditional AI has been the inability to understand human traits such as emotional state, for instance exhibited in writing, physical condition, or tone of voice. With AI’s cognitive intelligence capacities within reach, machines are increasingly able to sense, recognize, and decode human traits.

This holds the potential to fundamentally change the way people interact with machines, making technology capable of handling more complex tasks and ultimately augmenting humans to an extent previously unachievable.

Emotional Intelligence in its infancy
Except for advanced companies, survey results indicate that companies view the adoption of emotional intelligence in AI processes as the least important capability, and the one where they have the lowest competency. When asked to address why this is, companies across sectors and markets note that they are still at a relatively low maturity stage where more immediate requirements such as Advanced Analytics, Data Management and AI Leadership are more relevant and prevalent.

However, when taking a deeper look at the companies that have assessed themselves to be ‘Advanced’ in terms of general AI maturity - meaning that AI is actively contributing to many processes and enabling quite advanced tasks in the company - it is interesting to see that they perceive the Emotional Intelligence capability as more important with a score that is noticeable higher than the average score for all companies.

Many advanced companies perceive this to be either ‘very’ or ‘highly’ important. Notably, these companies come from five different markets and a wide variety of industries, including Life Sciences, Financial Services, TMT, CPR, and Services & Hospitality.

Value in customer-facing applications
The need for behavioral science to understand human needs is expected to increase with the integration of AI in smart devices, and in customer-facing applications such as chat bots, roboadvisory, customer inquiries processing, etc. The most advanced companies’ AI technologies are beginning to decode human emotions from text, such as irony, anger, and frustration. This will obviously become more valuable as it is increasingly applied in customer-facing solutions with the ability to learn and improve.

Human centricism requires strong leadership
While emotional intelligence holds great potential that could lead to early adopters gaining a competitive advantage, long-term success is dependent on not only technological development, but also leadership.

Leaders must drive the transformation that will make humans comfortable with intelligent technology, as a prerequisite for harvesting its potential benefits. What the most advanced companies have shown is that this transformation must augment human ingenuity to become truly effective.

It is given that we will see the rise of AI. All the big tech companies are spending money on AI capabilities. They have explicit visions to master human thinking and behavior. That may or may not happen in the next five years but certainly within a certain time frame. When you combine it with computing power, it will be inevitable.

— Skandia
Pensions and insurance

What to learn from AI leaders:
1. The most advanced companies are putting emotional intelligence to use within their AI applications, despite its relatively infant stage.
2. Companies must develop their behavioral science capabilities to mimic human behavior and translate it to technology.
3. Many have virtual assistants, chat bots, and NLP a powerful way to get started with building emotional intelligence into AI solutions.

Companies consider themselves least capable within Emotional Intelligence
How competent is your company within applying Emotional Intelligence?

<table>
<thead>
<tr>
<th>Competency</th>
<th>Importance</th>
<th>Avg. Score</th>
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<tbody>
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<td>3.6</td>
<td>3.5</td>
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</table>

Note: Remaining percent are ‘Don’t know’ responses
Novartis

Novartis sees AI as a business necessity, and has CEO-sponsored AI initiatives in several business functions, including drug discovery and clinical trials. In drug discovery, AI systems use predictive hypotheses to systematically and repeatedly search through possibilities, looking for compounds that interact desirably with biological processes and mechanisms, at a pace much faster than humans can accomplish.

AI enhances Novartis’ patient-centric clinical trials by identifying patients most appropriate for a particular study, including through genetic analysis. By broadening the patient search while simultaneously looking for precise characteristics, AI identifies more patients who would benefit from a particular drug therapy. This also increases the accuracy of the trials by controlling variables that might confound a study.

Novartis is also exploring how data and AI can support hospital decision-making and enhance patient treatment outcomes. In so doing, Novartis remains focused on what matters most: patient health.

To support these scientific uses of AI, Novartis is focused on digitization of workflow, company collaboration, as well as data, data ownership, and data privacy. This includes the legal implications of working with data globally, including complying with the rules and regulations of various countries, as well as the quality of the data.

As Novartis digitizes its workflow, it pays attention to its culture and people by continuously evaluating whether its culture is supporting the adoption of AI and other digital advances, and by highlighting agile concepts and enabling its workforce.

We have to get the data right in order for new AI developments to be useful. AI allows us to work faster, share information better, be even more patient-centric, and extend the reach of the services we provide.

What next?

As it looks to the future, Novartis sees AI as a means to improve its drug discovery, clinical trials, and other business functions. As a leader in the adoption and business benefits of AI, and with its strong reputation for quality and compliance, Novartis is positioned to remain ahead of the pack in AI development and adoption within the heavily regulated pharmaceutical industry.

Among the risks commonly associated with AI, the primary AI-related business risk is not adopting it fast enough.

It’s about having the right mindset. It’s not that tomorrow everything will be different. It’s all about building up capabilities and speeding up constantly. The power of technology in general is overestimated in the short term and underestimated for the long-term and I think that’s the case with AI too.

— VodafoneZiggo Telecommunications

This is going to go insanely fast, so it is just a matter of hanging in there and identifying which trains to follow.

— Tine Dairy

Novartis is one of the world’s leading pharmaceutical companies and one of the largest by both market capitalization and sales. Based in Switzerland, it traces its history back more than 250 years through a comprehensive legacy of companies brought together through mergers and acquisitions. As it exists today, Novartis started in 1996 through the merger of Ciba-Geigy and Sandoz. It develops and produces a wide portfolio of healthcare products, including within oncology, vaccines, eye care and generic medicines. Novartis employs 126,000 people worldwide and brought in $50 billion in revenue in 2017.

Artificial Intelligence in Europe

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Fast Forward
How to get started and take AI to the next level?

1. Choose a step-by-step approach in getting familiar with AI
Given the wide scope of AI and variations in use cases, it is key to start out by identifying what problems to solve and what opportunities to pursue. High level prioritizing between engaging customers, optimizing operations, empowering employees and/or transforming products and services adds clarity, is helpful to structure the discussion on a strategic level, and ensures a step-change approach to taking the company to the next AI level. Identify the problems you aim for AI to solve, prioritize the value with business owners, and acknowledge the capability gaps to get there. You need to get on the AI train, but do not jump on the AI wagon blindly. AI should serve your business plan, not vice versa.
Read more in the blog on LinkedIn about “AI for businesses: Not if, but when and how” by Michel van der Bel, Microsoft President, EMEA

2. Display executive leadership and approach AI from a position of strength
Leadership comes from the top, also in the case of AI. For this to happen, executives must understand AI essentials and strategic perspectives, and they must communicate a clear AI ambition to the organization. AI leaders must actively sponsor and mobilize AI adoption on all levels, from the Board and Executive levels, through Management and the operational employees. Staying ahead in the accelerating AI race requires executives to make nimble, informed decisions about where and how to employ AI in their business. When doing so, look to strongholds before bringing in the AI ‘twist’. Amplifying existing competencies is an excellent way to catalyze motivation and internal support.
Read more customer stories to see how others are using AI to transform their business, and learn from Microsoft Research on how AI is solving the most pressing challenges

3. Hire new skills ahead of the curve – or focus relentlessly on training existing talent
A key challenge for putting AI to productive use and accelerate intended outcomes is the war for skills and talent. This not only relates to data scientists and software engineers, but also to skill sets and experience within human and behavioral science. Opting for a follower strategy and being late to the game can prove risky, as talent seeks to go where talent is already. If aggressive poaching for insourcing talent is difficult to embrace, then work bottom up by training the engineers you already have on the new AI paradigm and collaboratively ride on the backs of the others. Regardless of strategy, focusing relentlessly on building required skills and talent is key to staying ahead and progressing along the learning curve.
Learn more in the Microsoft AI School about the open-source cognitive toolkit (previously known as CNTK) and how to help train deep learning algorithms

4. Build a data strategy and technology stack purposefully fit-for-AI
Training your AI products essentially requires significant data. Useful data. Valid data. Establishing a solid data strategy and practice in your organization to proficiently acquire data, identify data, clean data, measure data, and manage data will ultimately make your organization flourish with AI. Build your AI resources around data engineers who organize the data, data scientists that investigates the data, software engineers who develop algorithms and implement applications. Make sure that your structure and governance harness the power of data, and that your technology stack across products, solutions, and applications nimbly enables your AI priorities. When doing so, remember that your business model is likely to change.
Learn more about how to build a flexible platform and portfolio of AI tools and next generation smart applications where your data lives - whether in the intelligent cloud or on-premise

5. Beyond all, engender trust and enable human ingenuity
When designed with people at the center, AI can extend companies’ capabilities, free up creative and strategic endeavors, and help achieve more. Humans are the real heroes of AI – design experiences that augment and unlock human potential. Opt for a “people first, technology second” approach. This entails designing AI for where and how people work, play and live, bridging emotional and cognitive intelligence, tailoring experiences to how people use technology, respecting differences, and celebrating the diversity of how people engage. Thereby putting people first, reflects human values and promotes trust in AI solutions.
Learn more in the Microsoft Trust Center and the book ‘The Future Computed’ by Brad Smith and Harry Shum from Microsoft on artificial intelligence and its role in society

Designing for people
At Microsoft we believe that, when designed with people at the center, AI can extend your capabilities, free you up for more creative and strategic endeavors, and help you or your organization achieve more.

The following principles guide the way we design and develop our products:

- Humans are the heroes. People first, technology second. Design experiences that augment and unlock human potential.
- Know the context. Context defines meaning. Design for where and how people work, play, and live.
- Balance EQ and IQ. Design experiences that bridge emotional and cognitive intelligence.
- Evolve over time. Design for adaptation. Tailor experiences for how people use technology.
- Honor societal values. Design to respect differences and celebrate a diversity of experiences.

Innovation is what creates tomorrow.
Learn about our AI platform to innovate and accelerate with powerful tools and services that bring AI to every developer.
Explore Intelligent applications where you can experience the intelligence built into Microsoft products and services you use every day.
Learn about AI for business. Use AI to drive digital transformation with accelerators, solutions, and practices that empower your organization.
Who to Contact from Microsoft

The team that can empower your company to achieve more with AI

Pekka Horo
General Manager, Marketing & Operations, Microsoft WE
Pekka is leading the marketing, business operations and planning teams for Microsoft’s Western Europe area. Prior to his current role, he was the country General Manager for Microsoft’s subsidiary in Finland starting in that role in 2015. Pekka joined Microsoft through the Nokia devices & services business acquisition in 2014. Pekka began his career as a consultant at McKinsey & Company, and then over a 10 year career at Nokia, he held various global and regional leadership roles in business management, product and portfolio management and strategy & business development. Pekka is inspired by Microsoft’s mission to empower every person and every organization on the planet to achieve more. He sees significant growth and value creation opportunities that can be achieved through digital transformation.

Santina Franchi
General Manager, Enterprise Commercial, Microsoft WE
Santina empowers Microsoft’s largest customers and partners in their digital transformation. Passionate about customers she is focused on bringing relevant industry and/or role scenarios towards business and technical audiences in these organizations, in very close collaboration with our Services organization and the Microsoft partner eco-system. Previously Santina Franchi held several international executive positions at SAP and IBM.

Michel N’guettia
Business Group Lead Cloud & Enterprise, Cloud & Enterprise Marketing Group, Microsoft WE
Michel N’guettia is responsible for marketing Microsoft’s infrastructure software, data platform and cloud platform, helping WE companies transform their businesses and increase agility.

He empowers IT professionals, developers and business decision makers to deliver innovation to their organizations with Microsoft Azure Cloud Computing Platform & Services, Windows Server, SQL Server, and Visual Studio.

Prior to leading the Cloud & Enterprise business in Western Europe, N’guettia headed the Server & Tools business in The Netherlands and lead Product Marketing at HP Software, ISV’s and Software Incubation businesses.

Roberto Andreoli
Director Data, Artificial Intelligence and IoT, Microsoft WE
Roberto Andreoli is passionate in improving people’s lives and supporting WE organizations in digitally transforming through Data and AI. He empowers WE organizations in evangelizing and guiding them through all the different AI technologies, supporting in their AI maturity journey and help to make the implementation of Data and AI a success by applying a 360° approach. Andreoli held several national and international positions at Microsoft across audiences and products. He has been focusing on Public Sector, Small and Medium Business, Technical Evangelism, Dynamics and our Services organization. Previously he worked at SAP and Cedat, now part of the Altran group.
Contributors
from EY

Team responsible for the European edition of the study ‘Artificial Intelligence Report: Outlook for 2019 and Beyond’

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EY-Box is focused on digital strategy, growth ventures, innovation architecture and tech-led transactions. Thomas works with leading companies to uncover plausible futures, launch new businesses, and rewire their core through data and digital in the search for new profit pools and business models. He serves on the board for several entrepreneurial growth-stage businesses.

Thomas is responsible for the AI study across 15 markets in collaboration with central and local EY strategy teams and AI specialists.

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Ellen is a PhD in technology, policy, and management from MIT. She has masters degrees in engineering management and system design from MIT and in applied statistics from the University of Oxford. Ellen advised this study on research design, methodology, and analysis.

Ellen is engaged in the EY EMEIA Center of Excellence on innovation, analytics, and digital. She has worked with global organizations and start-ups, having recently served as the head of R&D for a precision Ag startup that uses AI to assist farmers.

Based in Zürich.

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Hanne.jesca.bax@nl.ey.com

Hanne Jesca Bax is the EMEIA Managing Partner Markets & Accounts and a member of EY’s EMEIA Executive. Hanne Jesca is responsible for leading EY’s integrated go-to-market and client service strategies for digital and emerging technologies, including AI and cognitive solutions. Further, she is responsible for key account management, service portfolio innovation, strategic alliances and acquisitions, managed services, and asset based solutions.

Hanne Jesca serves as overall responsible for EY’s regional AI leads that have contributed to this study.

Based in Amsterdam.

Vivek Nijhon
Partner, Advisory, Global Lead AI & Robotics, EMEIA
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Vivek is EMEIA head of Intelligent Automation and established this business for EY three years back. Previously to EY, he has held senior leadership positions in the IT industry where he managed large scale BPO implementation programs globally and advised large fortune client on their global technology and offshoring strategies. In his intelligent automation role he is focused on building EY’s services within AI and cognitive, as has been involved in this study as a central AI content lead across the EMEIA regions.

Based in London.


What’s Next for You?

Hanne Jesca Bax
Managing Partner Markets & Accounts, EMEIA
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Hanne Jesca Bax is the EMEIA Managing Partner Markets & Accounts and a member of EY’s EMEIA Executive. Hanne Jesca is responsible for leading EY’s integrated go-to-market and client service strategies for digital and emerging technologies, including AI and cognitive solutions. Further, she is responsible for key account management, service portfolio innovation, strategic alliances and acquisitions, managed services, and asset based solutions.

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