Achieving AI: A study of AI opportunities and obstacles

Fivetran

Objectives for the research

1. Explore the **current AI landscape.** What have organizations done already to lay the foundations?

2. Understand the **barriers** and **challenges** to adoption of AI.

3. Understand whether organizations are **overestimating** their **AI capabilities.** In reality, they have a long way to go.

4. Explore the **future.** What are the plans for **true AI utilization** moving forward?

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Key findings at a glance

1

Organizations appear to be **laying the foundations** as part of their AI journey, however there is **considerable work to be done** to achieve **full AI maturity.**

2

There are multiple and multifaceted challenges to AI adoption including the **manual nature of data processes,** issues with **data access and insight,** lack of time, skills and budget, and ultimately a fundamental lack of priority given to AI.

3

Many recognize that **AI is the future** and plan to increase investment accordingly. However, **a lack of trust in machine-led decision-making** may be the most fundamental barrier to overcome.

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AI is the future

Yet organizations have a long way to go before they are utilizing AI in its most sophisticated form

87%

...agree that AI is the future, and organizations that do not utilize it will fail to survive

71%

...of decisions, on average, are still made by people versus technology/machines

14%

...yet a small proportion feel that their organization is "advanced" when it comes to their journey adopting AI in its truest, most sophisticated form

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Survey Methodology

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Vanson Bourne surveyed 550 senior IT and data science professionals in July 2022, split as follows:

By Country

Country analysis (550) asked to all respondents

Country	Value
UK	137
Ireland	13
France	100
Germany	100
US	200
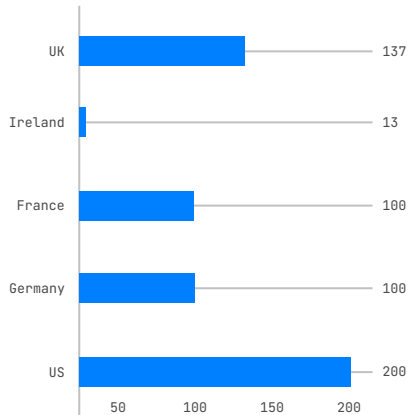
By Size

How many employees does your organization have globally? (550) asked to all respondents

220
1,000-2,999 employees

178
3,000-4,999 employees

152
5,000 or more employees
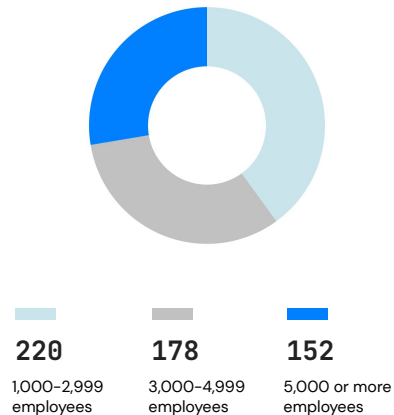
By Sector

Within which sector is your organization? (550) asked to all respondents

Sector	Value
IT, technology and telecoms	99
Manufacturing and production	85
Energy, oil/gas and utilities	84
Retail, distribution and transport	71
Media, leisure and entertainment	64
Public sector	51
Financial services	32
Business and professional services	15
Construction and property	13
Consumer services	2
Other commercial sector	34

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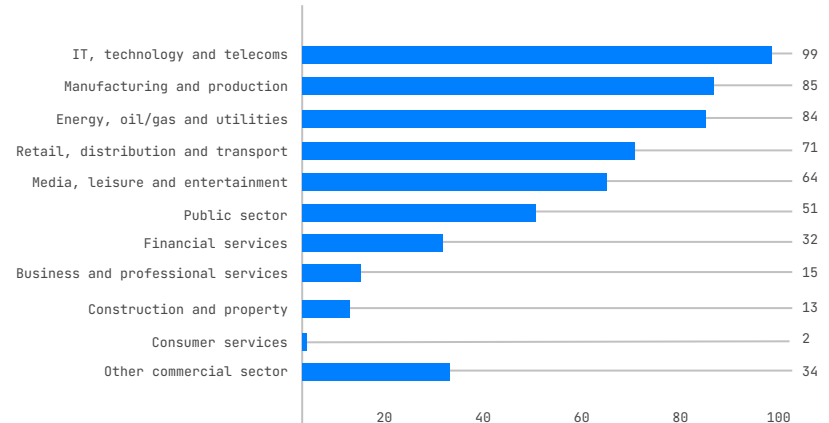# Vanson Bourne surveyed 550 senior IT and data science professionals in July 2022, split as follows:

By Department

Which of these best describes your position in the organization? (550) asked to all respondents

Information technology	323
Operations	197
Data science/ analytics	30

(x-axis: 100, 200, 300)
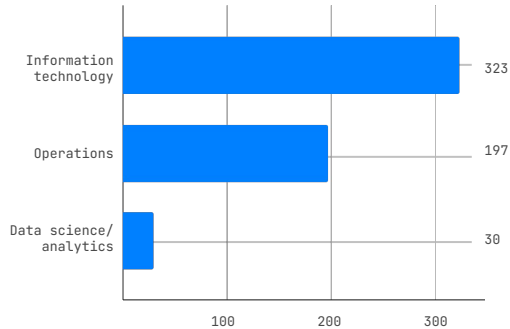
By Position

Which of these best describes your position in the organization? (550) asked to all respondents

Board member; C-level	187
Senior management; senior manager of unit, function or department	185
Mid-level management; manager or team or silo	122
Junior management; supervisory and frontline managers	9
Technical; development, programming, technician, analyst	47

(x-axis: 50, 100, 150, 200)
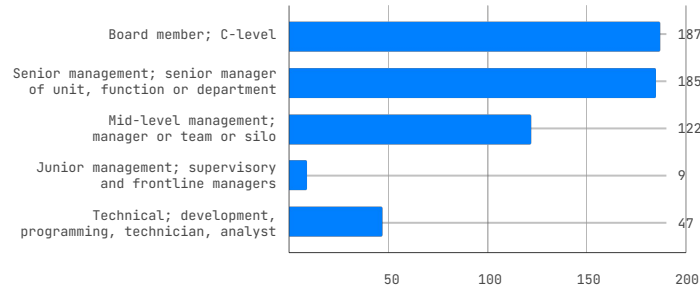
By Respondent Type

How many employees does your organization have globally? Respondent type (550) asked to all respondents

319
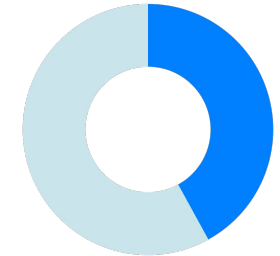Data science/analysts/IT analysts/equivalents

231
Senior IT

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Four areas of interest:

1

Current infrastructure and AI success

2

AI and decision-making

3

Key challenges
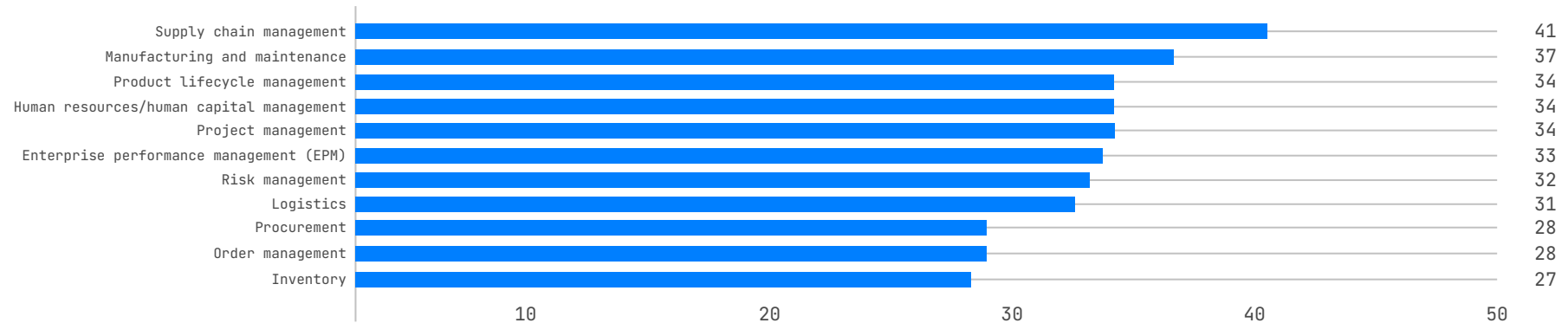
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Looking to the future

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1

Current infrastructure and AI success

Organizations have operational systems in place for a wide variety of capabilities

Looking at the capabilities that organizations have operational systems in place for, the three most likely areas are supply chain management, manufacturing and maintenance, and product lifecycle management. However, while it's positive to see that organizations have these systems in place, it's important to understand the extent to which they are collecting and utilizing the data from them, otherwise they are potentially costly but redundant

Which of the following capabilities does your organization currently have operational system in place for? (550) asked to all respondents.

Capability	Value
Supply chain management	41
Manufacturing and maintenance	37
Product lifecycle management	34
Human resources/human capital management	34
Project management	34
Enterprise performance management (EPM)	33
Risk management	32
Logistics	31
Procurement	28
Order management	28
Inventory	27

Almost all organizations are collecting and utilizing the data from their operational systems

Data collation is a key component within organizations, and many appear to be well on their way with this. However, just because organizations are fully utilizing their data, doesn't mean that they are doing this efficiently and some may still be at the start of their journey with this. If used effectively, data can play a crucial role within organizations for processes such as forecasting and decision-making. It's therefore positive to see that data is firstly being collected and utilized, but to what extent?
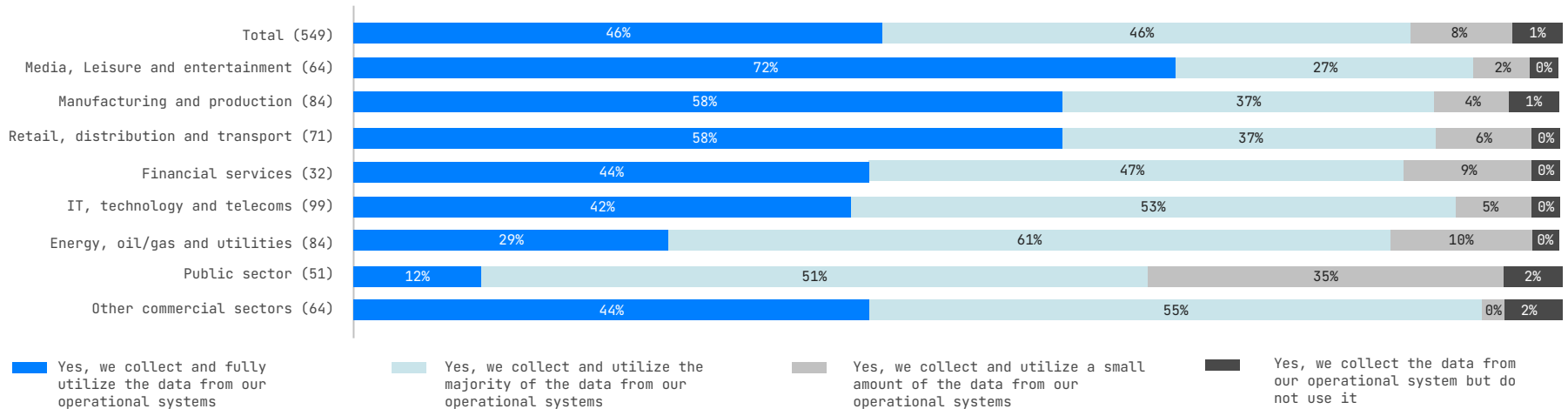
Does your organization collect and utilize the data from its operational systems? (Base numbers in chart) asked to respondents who have operational systems in place at Q3, split by country, omitting some answer options
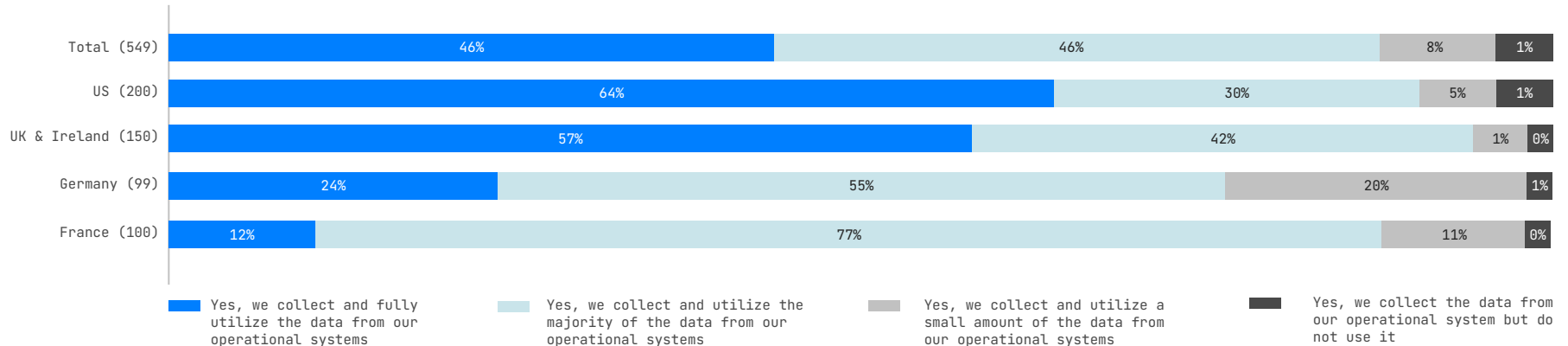
Total (549)	46%	46%	8%	1%
US (200)	64%	30%	5%	1%
UK & Ireland (150)	57%	42%	1%	0%
Germany (99)	24%	55%	20%	1%
France (100)	12%	77%	11%	0%

- Yes, we collect and fully utilize the data from our operational systems
- Yes, we collect and utilize the majority of the data from our operational systems
- Yes, we collect and utilize a small amount of the data from our operational systems
- Yes, we collect the data from our operational system but do not use it

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The extent to which organizations are collecting and utilizing the data from their operational systems varies by sector

Public sector organizations are the least likely to be fully utilizing data from their operational systems and this could be the case for a number of reasons. Perhaps there are barriers in the way such as a lack of internal skills, budget, time, or even outdated infrastructure. For some, utilizing this data may simply not be a priority. However, for those where it clearly is, such as in the media and manufacturing sectors, they're likely sitting on vast troves of data which, of course, is only useful if it is presented in a clear and useable format
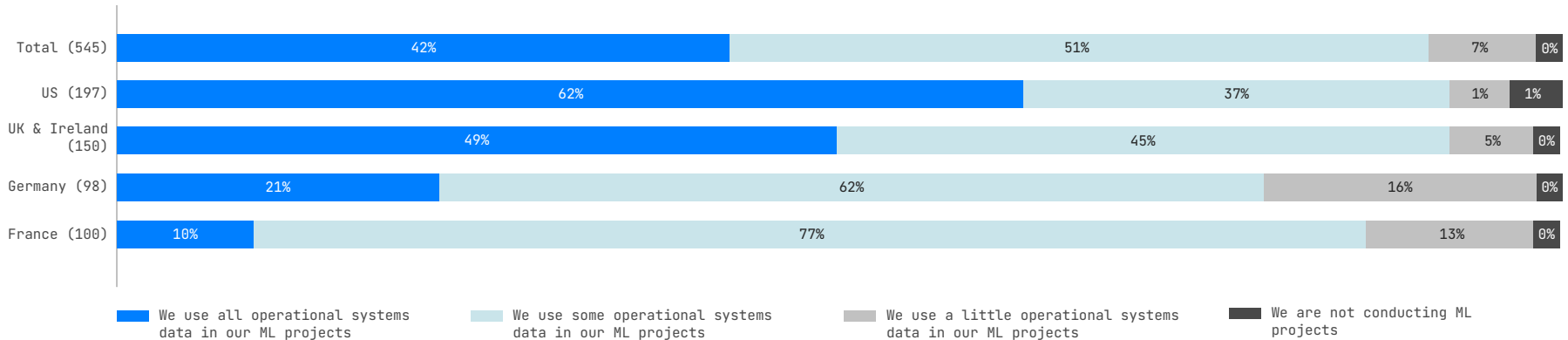
Does your organization collect and utilize the data from its operational systems? (Base numbers in chart) asked to respondents who have operational systems in place at Q3, split by sector, omitting some answer options

Sector	Yes, we collect and fully utilize the data from our operational systems	Yes, we collect and utilize the majority of the data from our operational systems	Yes, we collect and utilize a small amount of the data from our operational systems	Yes, we collect the data from our operational system but do not use it
Total (549)	46%	46%	8%	1%
Media, Leisure and entertainment (64)	72%	27%	2%	0%
Manufacturing and production (84)	58%	37%	4%	1%
Retail, distribution and transport (71)	58%	37%	6%	0%
Financial services (32)	44%	47%	9%	0%
IT, technology and telecoms (99)	42%	53%	5%	0%
Energy, oil/gas and utilities (84)	29%	61%	10%	0%
Public sector (51)	12%	51%	35%	2%
Other commercial sectors (64)	44%	55%	0%	2%

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Organizations are using data from operational systems in ML projects, but there is room for improvement

Further evidence indicating that organizations are laying the foundations to use AI, is that most use at least some of their operational data in their Machine Learning (ML) projects. As well as being the most likely to collect and fully utilize their operational systems data, those in the US are also the most likely to be using it in their ML projects. On the other hand, those in France are the least likely. Although many say that they are doing this, they could be in the early stages of this journey as opposed to this being something that has been in place for some time.
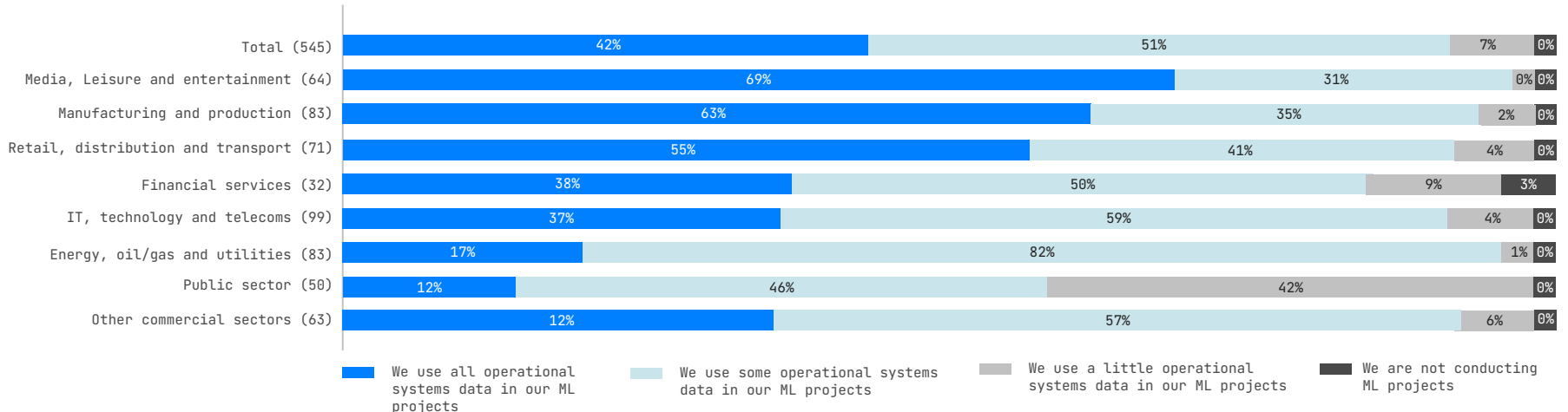
To what extent is your organization using data from operational systems in Machine Learning (ML) projects? (Base number in chart) asked to respondents whose organization collects and utilizes data from operational systems, split by country, omitting some answer options

Country	We use all operational systems data in our ML projects	We use some operational systems data in our ML projects	We use a little operational systems data in our ML projects	We are not conducting ML projects
Total (545)	42%	51%	7%	0%
US (197)	62%	37%	1%	1%
UK & Ireland (150)	49%	45%	5%	0%
Germany (98)	21%	62%	16%	0%
France (100)	10%	77%	13%	0%

- We use all operational systems data in our ML projects
- We use some operational systems data in our ML projects
- We use a little operational systems data in our ML projects
- We are not conducting ML projects

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The extent to which organizations are using operational systems in ML projects varies by sector

Similarly, (slide 12) organizations in the public sector are the least likely to be using their organization's operational systems data in their ML projects, likely because they are the least likely to be collecting it at all. In order for these ML projects to be successful, organizations must ensure that their data is accurate, accessible, and formatted in such a way that can be easily used as part of their ML projects, otherwise this risks becoming time consuming and costly

To what extent is your organization using data from operational systems in Machine Learning (ML) projects? (base numbers in chart) asked to respondents whose organization collects and utilizes data from operational systems, split by sector, omitting some answer options

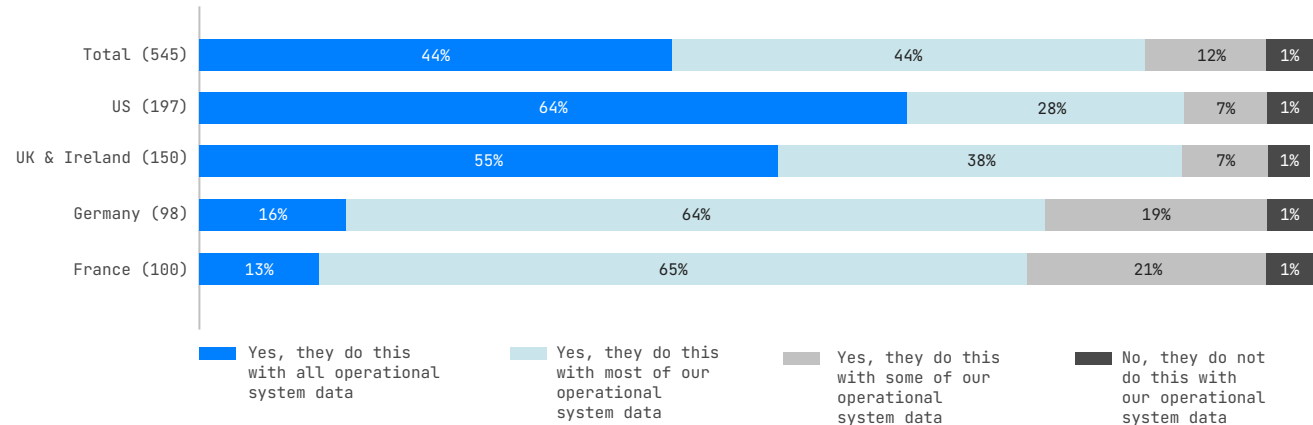| Sector	We use all operational systems data in our ML projects	We use some operational systems data in our ML projects	We use a little operational systems data in our ML projects	We are not conducting ML projects
Total (545)	42%	51%	7%	0%
Media, Leisure and entertainment (64)	69%	31%	0%	0%
Manufacturing and production (83)	63%	35%	2%	0%
Retail, distribution and transport (71)	55%	41%	4%	0%
Financial services (32)	38%	50%	9%	3%
IT, technology and telecoms (99)	37%	59%	4%	0%
Energy, oil/gas and utilities (83)	17%	82%	1%	0%
Public sector (50)	12%	46%	42%	0%
Other commercial sectors (63)	12%	57%	6%	0%

Many organizations have data scientists who work with the data from operational systems and apply this to AI/ML frameworks

Perhaps as a result of targeting larger organizations (with 1000+ employees), all say that they have a data scientist. This gives further indication that organizations are laying the foundations for their use of AI or are at least recruiting staff with the relevant skills to do so. Of these data scientists, most are working with at least some of the data from operational systems and applying AI/ML frameworks, which is an expected part of their role. However, while this is the case, are they truly being utilized to their full potential?

100%

...have a data scientist within their organization

Do the data scientists within your organization work with the data from the operational systems and apply AI/ML frameworks? [base numbers in chart] asked to respondents whose organization collects and utilizes data from operational systems, split by country, omitting some answer options

	Yes, they do this with all operational system data	Yes, they do this with most of our operational system data	Yes, they do this with some of our operational system data	No, they do not do this with our operational system data
Total (545)	44%	44%	12%	1%
US (197)	64%	28%	7%	1%
UK & Ireland (150)	55%	38%	7%	1%
Germany (98)	16%	64%	19%	1%
France (100)	13%	65%	21%	1%

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For the purpose of this research, **Artificial Intelligence (AI)** refers to the combination of computer science and data to build smart, domain-specific machines (i.e., autonomous machines and applications, etc.) with the ability to make decisions and/or predictions.
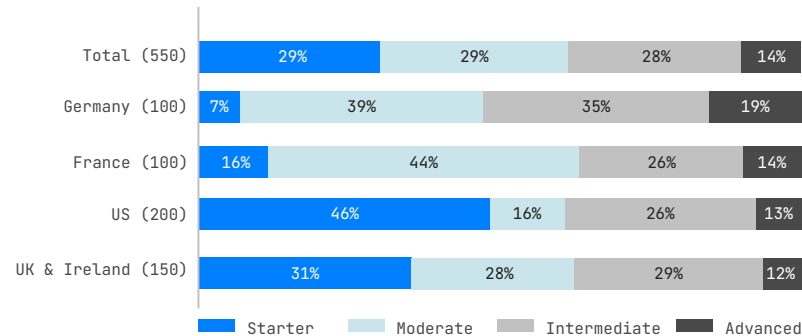
For the purpose of this research, **data science** is defined as a combination of multiple interdisciplinary fields such as scientific methods, mathematics, statistics, artificial intelligence, etc. Data scientists use these disciplines to extract knowledge and insights from vast troves of data to create Machine Learning (ML) algorithms that are critical to the production of Artificial Intelligence (AI) and smart machines. The automated insights gained from these smart machines can then be used to inform business decisions.
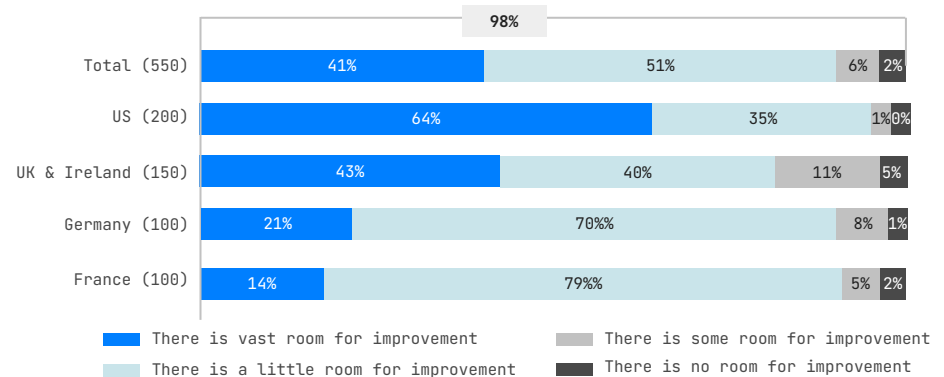
However, while organizations have the infrastructure in place, very few consider themselves to be advanced in their journey to using AI in its true, sophisticated form

There are, however, indications that while organizations are collecting and utilizing data (slides 10–14) and have data scientists in place (slide 15), many still feel that they are at the "starter" stage when it comes to how far they are on their journey to using AI it its true, sophisticated form. Further to this, almost all feel that their organization could improve its use of AI. Therefore, there are indications that simply collecting vast troves of data is just the beginning of true use of AI. If this isn't useable or accessible, organizations will struggle to implement AI in its true form to really appreciate the benefits

Thinking about the previous definition of Artificial Intelligence (AI), which of the following best describes how far along your organization is on its journey to using AI in its true, sophisticated form? [base numbers in chart] asked to all respondents, split by country

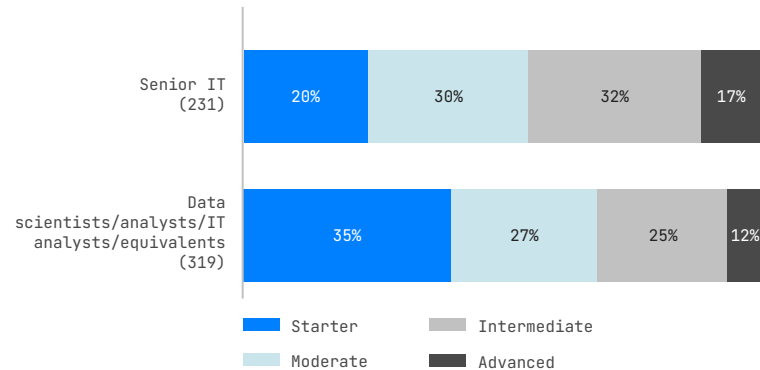|	Starter	Moderate	Intermediate	Advanced
Total (550)	29%	29%	28%	14%
Germany (100)	7%	39%	35%	19%
France (100)	16%	44%	26%	14%
US (200)	46%	16%	26%	13%
UK & Ireland (150)	31%	28%	29%	12%

Thinking about the previous definition of Artificial Intelligence (AI), to what extent could your organization improve its use of AI? [base numbers in chart] asked to all respondents, split by country

98%

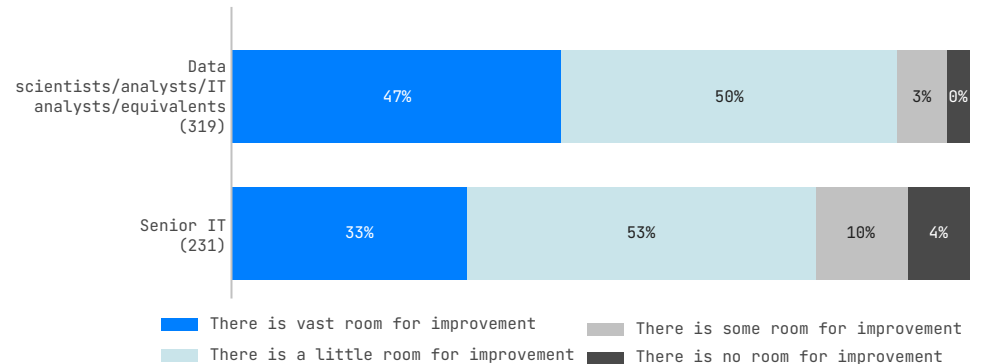|	There is vast room for improvement	There is a little room for improvement	There is some room for improvement	There is no room for improvement
Total (550)	41%	51%	6%	2%
US (200)	64%	35%	1%	0%
UK & Ireland (150)	43%	40%	11%	5%
Germany (100)	21%	70%	8%	1%
France (100)	14%	79%	5%	2%

However, while organizations have the infrastructure in place, very few consider themselves to be advanced in their journey to using AI in its true, sophisticated form

Within organizations, data scientists are more likely to say that their organization is at the "starter" stage when it comes to how far they are on their journey to using AI it its true, sophisticated form and also that there is vast room for improvement in their use of AI. These employees likely have more visibility and knowledge as to what true AI use looks like, what it entails, and how to properly achieve it. Conversely, those in Senior IT decision-making roles are perhaps more out of touch and are therefore making assumptions on this as opposed to an educated and informed opinion

Thinking about the previous definition of Artificial Intelligence (AI), which of the following best describes how far along your organization is on its journey to using AI in its true, sophisticated form? [base numbers in chart] asked to all respondents, split by respondent type

	Starter	Moderate	Intermediate	Advanced
Senior IT (231)	20%	30%	32%	17%
Data scientists/analysts/IT analysts/equivalents (319)	35%	27%	25%	12%

Thinking about the previous definition of Artificial Intelligence (AI), to what extent could your organization improve its use of AI? [base numbers in chart] asked to all respondents, split by respondent type

	There is vast room for improvement	There is a little room for improvement	There is some room for improvement	There is no room for improvement
Data scientists/analysts/IT analysts/equivalents (319)	47%	50%	3%	0%
Senior IT (231)	33%	53%	10%	4%

2

AI and decision-making

People still play a huge part in decision-making within organizations, which may stem from underperforming AI models

The improvement required in AI use (slides 17 and 18) is impacting the way in which decisions are made, ultimately reducing efficiency and certainty across organizations. Technology is not being utilized to its full extent in decision-making, with people still heavily involved in this process. With organizations losing a proportion of global annual revenue because of underperforming AI programs that use low-quality data, this emphasizes the need for them to ensure their data quality is up to scratch so that they can fully leverage the benefits of AI

↑ UK & Ireland: 77%
↓ France: 60%

↑ Retail, distribution and transport: 78%
↓ Financial services: 63%

↑ IT: 73%
↓ Data science/analytics: 64%

71%

…of decisions, on average, are still made by people versus technology/machines

What proportion of decisions are made by the people in your organization versus technology/machines? [550] asked to all respondents, showing the average
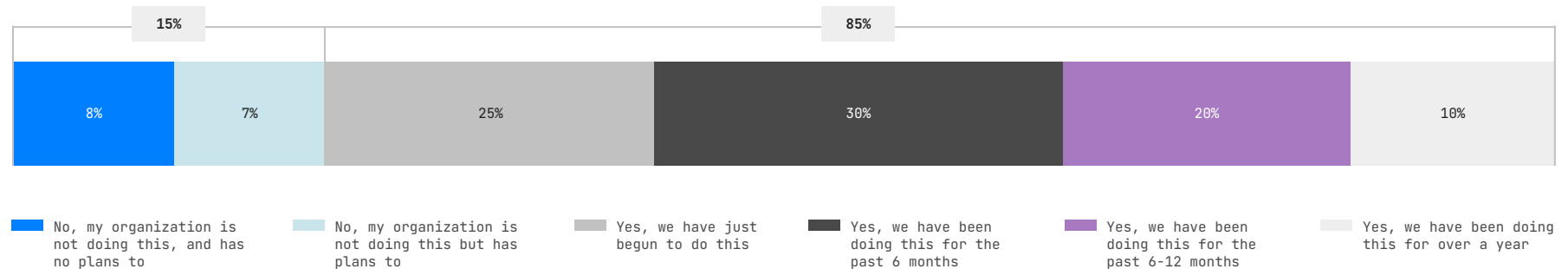
5%

…of global annual revenue, on average, is lost because of underperforming AI programs/models that are built using inaccurate or low-quality data

If measured, approximately what percentage of your organization's global annual revenue is lost because of underperforming AI programs/models that are built using inaccurate or low-quality data which therefore leads to misinformed business decisions? [550] asked to all respondents, showing the average

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While organizations are using ML/AI methodologies to build models within business apps, they are still at the beginning of their journey
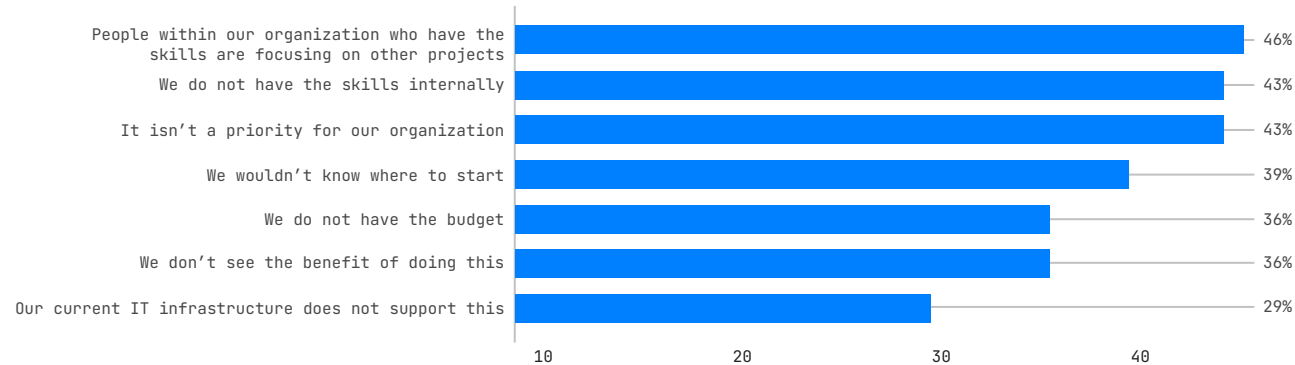
The minority of respondents say that they have been using ML/AI methodologies to build models within business apps for over a year, indicating that this is still early days for many. Building these models using ML/AI methodologies is an extremely sophisticated and complex process, and so will naturally take time to design, implement and utilize. While a small proportion, it's important to understand why there are organizations that are yet to do this, so that they can be given any appropriate support they need

Is your organization using ML/AI methodologies to build models within its business applications that are being used to automatically make predictions and/or decisions around business processes? [550] asked to all respondents

15%		85%			
No, my organization is not doing this, and has no plans to	No, my organization is not doing this but has plans to	Yes, we have just begun to do this	Yes, we have been doing this for the past 6 months	Yes, we have been doing this for the past 6-12 months	Yes, we have been doing this for over a year
8%	7%	25%	30%	20%	10%

However, there are a number of reasons why organizations are not building models from business applications to automatically make predictions and/or business decisions

Delving deeper into why some aren't building models from business applications to automatically make predictions and/or business decisions, the two most likely reasons center on skills – either people have the skills, but their attention is focused elsewhere, or they don't have the skills at all. The IT skills gap is a prominent challenge within organizations currently, that may wish to turn to outsourcing, recruitment or internal upskilling and training of employees to alleviate these challenges. Notably, some respondents say that they do not see the benefit of building models from business applications to automatically make predictions and/or business decisions, and so need to be educated on the advantages of doing so to encourage this

Reason	Percentage
People within our organization who have the skills are focusing on other projects	46%
We do not have the skills internally	43%
It isn't a priority for our organization	43%
We wouldn't know where to start	39%
We do not have the budget	36%
We don't see the benefit of doing this	36%
Our current IT infrastructure does not support this	29%

Why is your organization not building models from business applications to automatically make predictions and/or business decisions? [83] asked to respondents whose organization is not building models from business applications to automatically make predictions and/or business decisions

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3

Key challenges

There are many data–specific challenges that organizations are facing

When looking at the different stages of preparing data, from accessing it all the way through to translating it into practical advice for decision–makers, it appears that organizations are finding every stage equally as challenging. Each element of the process is of equal importance, because if one isn't completed properly, this can impact the overall quality of the data. Organizations are losing global annual revenue as a result (slide 20) and so it's vital that these stages are made simpler, or even automated to improve productivity and time

71%
…find accessing all the data needed to run AI programs, workloads and models a challenge

69%
…find accessing the right data at the right time a challenge

72%
…find cleansing data into the right format to make it useable a challenge

Thinking specifically about the data your organization holds, to what extent does your organization find the following a challenge? [550] asked to all respondents

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There are many data–specific challenges that organizations are facing

Some may argue that translating data insights into practical advice for decision-making is the most important stage of the data preparation process, and so it's concerning to see that three quarters find this to be challenging in some way. If decision-makers are unable to use data to make informed decisions, then why should organizations be taking the time to collect it in the first place? Data is absolutely invaluable across all different roles and departments within organizations, and so processes such as extracting and transforming it shouldn't be made challenging

73%

…find extracting and loading data from different sources into different warehouses a challenge

73%

…find transforming data from different sources into different warehouses a challenge

73%

…find translating data insights into practical advice for decision-makers a challenge

Thinking specifically about the data your organization holds, to what extent does your organization find the following a challenge? [550] asked to all respondents
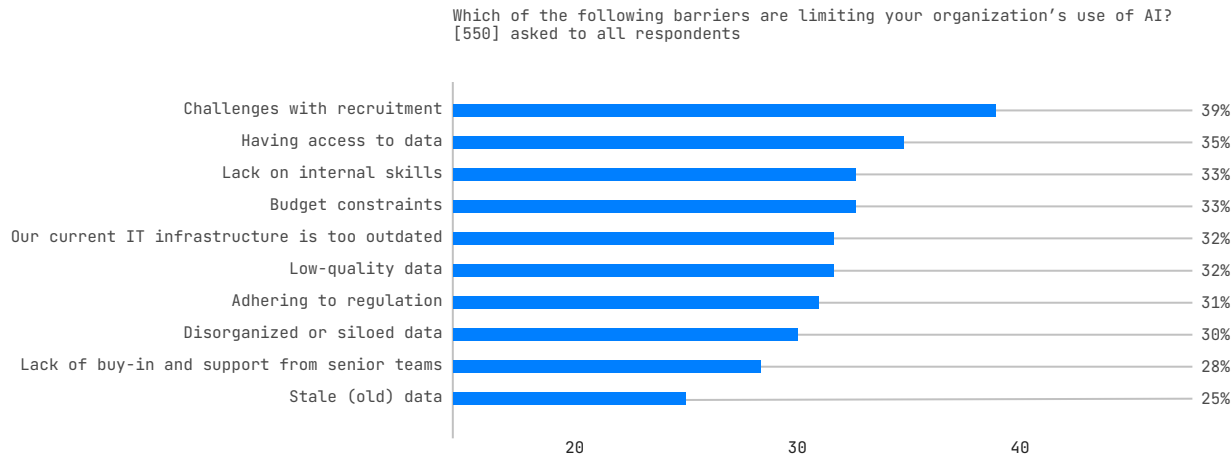
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On top of this, there are a multitude of other challenges being faced too

While things like a lack of skills are holding organizations back in other areas (slide 22) this appears to be a barrier to using AI too, and so it's clear that this is a main challenge that organizations must look to address. There is further evidence of data causing challenges across organizations (slides 24 and 25) with low-quality, disorganized or siloed, and stale (old) data also limiting organizations' use of AI. Data processes are clearly causing issues across organizations, and so they should look to automate these, given that the majority say that they are still manual, which naturally take more time and effort

90%

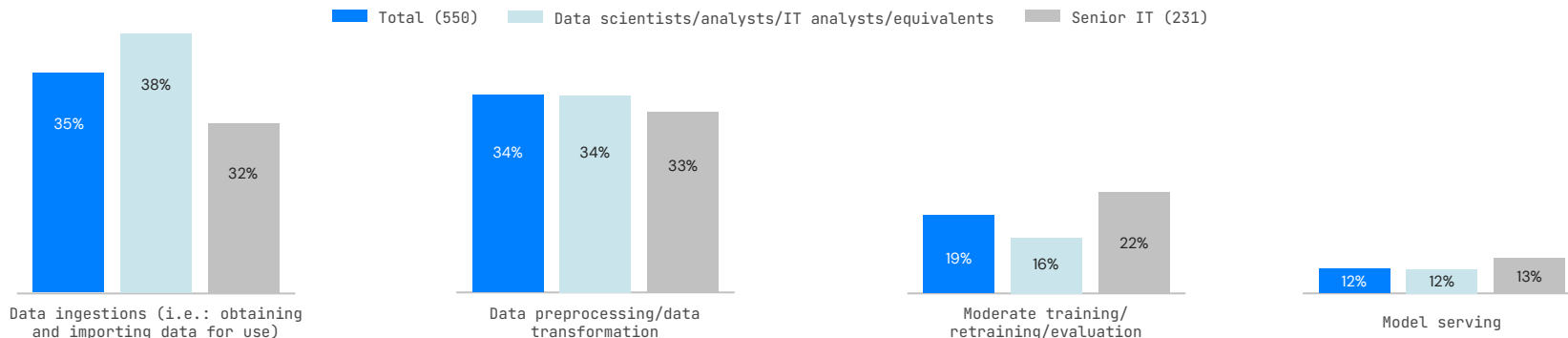…agree that data processes are still manual in their organization. They've yet to fully automate the process

To what extent do you agree or disagree with the following statements? [550] asked to all respondents

Which of the following barriers are limiting your organization's use of AI? [550] asked to all respondents

Barrier	%
Challenges with recruitment	39%
Having access to data	35%
Lack on internal skills	33%
Budget constraints	33%
Our current IT infrastructure is too outdated	32%
Low-quality data	32%
Adhering to regulation	31%
Disorganized or siloed data	30%
Lack of buy-in and support from senior teams	28%
Stale (old) data	25%

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However, organizations are showing desire to improve their use of automation to make internal processes more productive and impactful

When diving deeper into automation requirements, if respondents could automate one process, the two most likely steps would be data ingestion or data preprocessing/transformation. Automating these processes would certainly alleviate challenges that organizations are facing (slides 24 and 25) and would also free up time for employees such as data scientists to spend more time building AI models rather than preparing data

If your organization could automate one of the following steps in the AI workflow process to make it more productive and impactful, which step would you choose? [base numbers in chart] asked to all respondents, split by respondent type, omitting some answer options

Legend: Total (550) | Data scientists/analysts/IT analysts/equivalents | Senior IT (231)

Data ingestions (i.e.: obtaining and importing data for use): 35%, 38%, 32%
Data preprocessing/data transformation: 34%, 34%, 33%
Moderate training/retraining/evaluation: 19%, 16%, 22%
Model serving: 12%, 12%, 13%

It's clear that data scientists are not being used to their full potential within organizations

Further indication that data scientists are spending more time working with data rather than building AI models (slide 27) is confirmed by the majority agreeing that they're not being utilized to their full potential. Data scientists should be spending much more of their time building AI models to improve a multitude of business areas such as forecasting and decision–making. If organizations dedicate time and budget to improving data quality, then their data scientists will have more time to concentrate on building AI models to inform business decisions

87%

…agree that in their organization, data scientists/engineers are not being utilized to their full potential

To what extent do you agree or disagree with the following statements? [550] asked to all respondents

70%

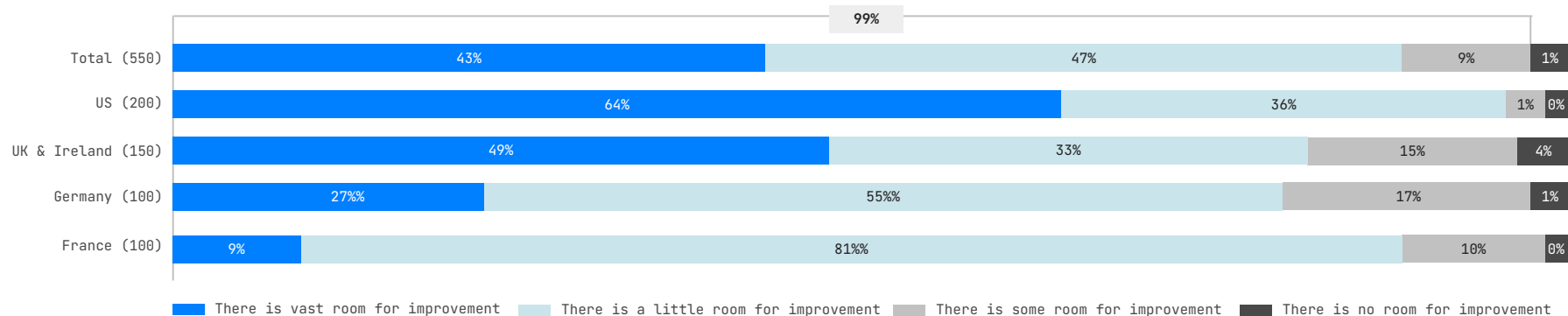…the average proportion of time that data scientists within organizations are working with/preparing data versus building AI models

Approximately, what proportion of time are the data scientists within your organization working with/preparing data versus building AI models? [545] asked to organizations that collect and utilize operational systems data and have a data scientist within their organization, showing the average

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28

Organizations are showing signs that they are struggling to adhere to data governance roles, policies, and standards to ensure data is being used effectively and securely

On top of contending with other challenges (slide 26), organizations also have government regulations to take into account, too. Almost all say that there is at least a little room for improvement when it comes to adhering to these roles, policies and standards. It's absolutely vital that they work to improve this as a data and/or privacy breach can have massively detrimental consequences

To what extent could your organization improve its adherence to data governance roles, policies, and standards to ensure data is being used effectively, securely and in accordance with government regulations? [base numbers in chart] asked to all respondents, split by country

	There is vast room for improvement	There is a little room for improvement	There is some room for improvement	There is no room for improvement
Total (550)	43%	47%	9%	1%
US (200)	64%	36%	1%	0%
UK & Ireland (150)	49%	33%	15%	4%
Germany (100)	27%%	55%%	17%	1%
France (100)	9%	81%%	10%	0%

99%

4

Looking to the future

Although many believe that AI is the future, organizations still have a long way to go

While there are challenges along the journey to AI implementation, organizations do recognize that it is the future. However, when the spotlight is cast on the reality of adoption, there is much room for improvement. Organizations should look to make changes as it is believed that those that don't, will fail to survive. This may take time as there is some evidence of distrust, as many say that they would struggle to fully trust AI to make all business decisions. This lack of trust means that AI may potentially never be used in its truest form, and this would also make it harder to achieve buy-in for those who control the purse strings

87%
...agree that AI is the future, and organizations that do not utilize it will fail to survive

92%
...agree that when putting the spotlight on the reality of AI adoption, most organizations have a long way to go
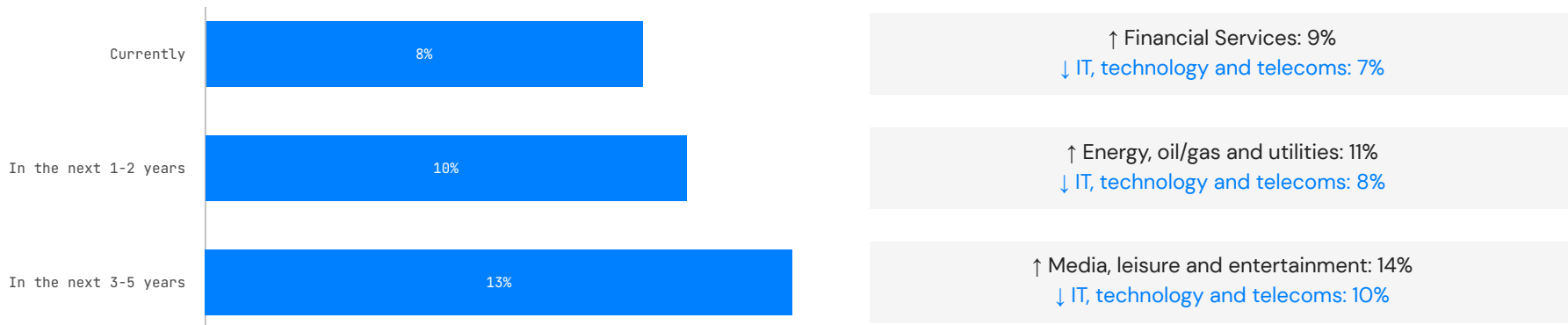
86%
...agree that their organization would struggle to fully trust AI to make all business decisions – humans will always be involved in some way

To what extent do you agree or disagree with the following statements? [550] asked to all respondents

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AI investment is expected to increase over the next few years

However, it does seem as though organizations are planning on slowly increasing their financial investments over the next 5 years. It's clear that this is a marathon, not a sprint, as there are still many barriers to overcome such as lack of skills, poor quality data, and low trust. First, organizations need to make sure that their data is high-quality and in a useable format, before they jump straight into AI. This may be an expensive investment, and so in order to be truly successful, they must be made aware of the benefits

What proportion of your organization's global annual revenue has been/will be dedicated to AI investments in the following time frames? [550] asked to all respondents, showing averages only

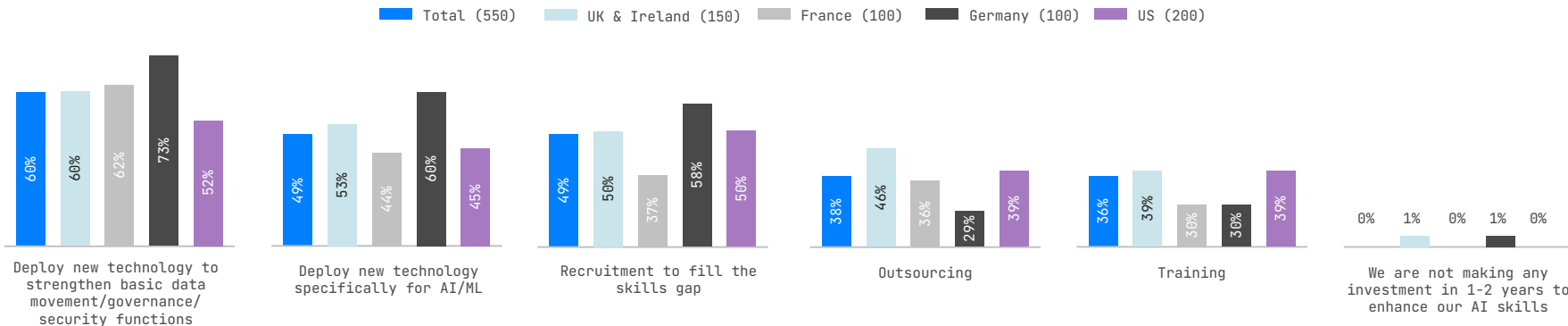|	
Currently — 8%	↑ Financial Services: 9% ↓ IT, technology and telecoms: 7%
In the next 1-2 years — 10%	↑ Energy, oil/gas and utilities: 11% ↓ IT, technology and telecoms: 8%
In the next 3-5 years — 13%	↑ Media, leisure and entertainment: 14% ↓ IT, technology and telecoms: 10%

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On top of financial investments, organizations are set to make investments in other areas too

While increased financial investments (slide 32) appear to be on the cards, organizations are also planning on making changes across the wider business, too. Technology will play an important role in the journey to AI and so it's positive to see that most hope to deploy new technology to strengthen basic data functions as well as specifically for AI/ML. It's clear that a lack of skills is a key challenge, and so recruitment, outsourcing and training are sure to alleviate this. Once this gap is filled, the right people can be in the right place to ensure data is of a high quality and being utilized to its highest potential, saving time, and enhancing business areas and processes across the wider organization

Which of the following investments does your organization plan to make in the next 1-2 years to enhance its AI use/skills? [550] asked to all respondents

Legend: Total (550) · UK & Ireland (150) · France (100) · Germany (100) · US (200)

Investment	Total (550)	UK & Ireland (150)	France (100)	Germany (100)	US (200)
Deploy new technology to strengthen basic data movement/governance/security functions	60%	60%	62%	73%	52%
Deploy new technology specifically for AI/ML	49%	53%	44%	60%	45%
Recruitment to fill the skills gap	49%	50%	37%	58%	50%
Outsourcing	38%	46%	36%	29%	39%
Training	36%	39%	30%	30%	39%
We are not making any investment in 1-2 years to enhance our AI skills	0%	1%	0%	1%	0%

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