



# AI IN HEALTHCARE: Early Stage with Steady March to Maturity

RESEARCH BY:



**Cynthia Burghard**  
Research Director, Value-based Healthcare  
IT Transformation Strategies, IDC



## Navigating this White Paper

*Click on titles or page numbers to navigate to each section.*

|                                                                                        |           |
|----------------------------------------------------------------------------------------|-----------|
| <b>Executive Summary</b>                                                               | <b>3</b>  |
| <b>The Study</b>                                                                       | <b>4</b>  |
| <b>Key Findings</b>                                                                    | <b>5</b>  |
| Healthcare Catching Up to Other Industries in AI Maturity                              | 5         |
| Data: Both a Critical Success Factor and a Barrier to Successful AI Adoption           | 6         |
| Use Cases Across Clinical, Operational, and Analytic Domains                           | 7         |
| <b>Situation Overview</b>                                                              | <b>8</b>  |
| Healthcare Providers Less Mature in AI Adoption Than Organizations in Other Industries | 8         |
| Germany Ahead in AI Adoption                                                           | 9         |
| Drivers of AI                                                                          | 10        |
| Barriers to AI Adoption                                                                | 11        |
| Lack of Adequate Volume of Quality Training Data                                       | 12        |
| Critical Success Factors                                                               | 13        |
| Funding and Staffing of AI Initiatives for Healthcare Providers                        | 13        |
| Development Strategies                                                                 | 14        |
| Priority Use Cases Span Clinical, Operational, and Analytic Domains                    | 15        |
| Inferencing to Improve Data Quality                                                    | 16        |
| Read Images to Assist with Diagnoses                                                   | 17        |
| Early Identification of Hospital-Acquired Infection                                    | 17        |
| <b>Essential Guidance</b>                                                              | <b>18</b> |
| <b>Methodology</b>                                                                     | <b>19</b> |
| <b>About the Analyst</b>                                                               | <b>20</b> |
| <b>Message from the Sponsor</b>                                                        | <b>21</b> |



# Executive Summary

**Slow to embrace artificial intelligence (AI), healthcare organizations are accelerating the pace of adoption by establishing the organizational and technical infrastructure required and delivering use cases across the entire enterprise.**

Early application of AI in healthcare was often a result of grant-based research to promote innovation in clinical care. The results of many of these projects were not commercialized and thus remain in the annals of peer-reviewed journals. As healthcare providers see the benefits of applying AI to deliver insights that help avoid adverse events such as readmissions, their comfort level has grown.

This white paper is based on the results of the *AI in Healthcare Survey* conducted by IDC and sponsored by InterSystems. The respondents of the *AI in Healthcare Survey* identified a broad set of AI use cases indicating that AI adoption is extending across many areas of the hospital.

While healthcare lags other industries in the deployment of AI, healthcare organizations are building the organizational infrastructure to manage the funding, staffing, data management, and patient privacy policies and procedures for AI.



**Organizations are building the organizational infrastructure to manage the funding, staffing, data management, and patient privacy policies and procedures for AI.**

Unlike other IT investment decisions that are funded increasingly by line of business, AI funding is primarily determined by an annual IT budget, and in some cases, funding decisions are made solely by IT. This may be an early-stage situation as organizations get their “feet wet,” but it is not sustainable. IDC believes that it is a best practice to use interdisciplinary teams to drive AI initiatives from inception to production. The teams must include business and/or clinical representatives; respondents to the *AI in Healthcare Survey* support this belief.

As with so many innovations, good, clean, well-organized data is key to success, and poor quality data often represents a challenge. The survey respondents identified volume and quality of data for training as a barrier and recognized that sufficient data volume and confidence in the data are critical success factors. The challenges of data and the lack of skilled data scientists may well be the drivers for providers’ preference to use third-party vendors to develop AI capabilities. Few organizations are developing AI in house, and a marked decline in the use of commercial off the shelf (COTS) as a primary development approach is expected from 2020 to 2023. IDC believes that it is also key to have a data management technology that supports both transactions and analytics as the acceptable latency from insight to action is shortening.

The breadth of use cases identified by respondents is an indication of how widespread the use of AI is becoming in hospitals. While one-third of organizations in the *AI in Healthcare Survey* identified grants as their primary funding source, the use of AI now goes beyond academic research. Today AI is being used to improve data quality using inferencing, to improve back-office productivity, and to read images to assist in diagnosis and predict adverse events. The breadth of use cases gives reason for optimism that healthcare organizations will continue their march toward maturity in the use of AI to transform their businesses.

## THE STUDY

This white paper is based on the results of the *AI in Healthcare Survey* conducted by IDC and sponsored by InterSystems. The survey evaluates the relative maturity of artificial intelligence adoption for healthcare providers in Germany, the United States, and the United Kingdom, including an understanding of the operational and organizational structure of AI initiatives and top priority AI use cases. Data from additional relevant IDC surveys is also included and noted by source.

The *AI in Healthcare Survey* was fielded in May 2020. A total of 210 hospitals were surveyed across three countries. The sample size for each country is as follows: 105 respondents in the United States, 54 respondents in Germany, and 51 respondents in the United Kingdom. Readers should be aware of the implications of small sample sizes. Data from the *AI in Healthcare Survey* should be considered directional. The Methodology section provides a profile of respondents.



**210 hospitals surveyed:**  
105 in U.S.  
54 in Germany  
51 in U.K.

# Key Findings

## Healthcare Catching Up to Other Industries in AI Maturity

Healthcare has notoriously lagged in its investment in and adoption of information technology, and AI is no exception. **The *AI in Healthcare Survey* revealed that the number 1 factor holding healthcare providers back from more extensive AI adoption is a lack of skilled personnel (data scientists and engineers).** While 41% of organizations reported that the budget for AI is part of the annual IT budget, only 21% of organizations intend to build AI algorithms in house in 2020, declining to 18% by 2023. Healthcare providers are turning to third-party vendors to develop their AI initiatives. Historically, the adoption of AI initiatives (particularly those focused on clinical practices) has been limited to grant-funded academic medical research.

While healthcare lags other industries in the deployment of AI, healthcare providers are building the organizational infrastructure to manage AI going forward.



Just over 50% of respondents **have an AI framework in place;** the rest will be online within 24 months.



**Data governance and management policies and procedures are AI specific** in 58% of healthcare provider organizations surveyed.



In total, 38% of healthcare organizations indicated that **AI is a corporate priority** versus 53% in a multisector worldwide survey

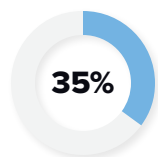
(see *Artificial Intelligence Global Adoption Trends and Strategies*, IDC #US45120919, September 2019).



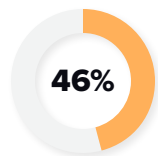
**Germany appears to be ahead** of the United States and the United Kingdom across a number of metrics related to AI maturity.

# Data: Both a Critical Success Factor and a Barrier to Successful AI Adoption

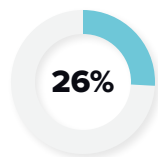
Accuracy of and access to data have long been among the greatest challenges for healthcare organizations. The heterogeneity of data sources, incomplete and duplicate data, and the lack of standards are all barriers to creating an enterprise data platform to feed AI. Data challenges are increasingly being identified as a gating factor to innovation and operational improvements in general, and yet competence in AI requires access to high volumes of quality data that most provider organizations are unable to attain. This is especially true of data required for model development and testing.



**Adoption of AI for inferencing to improve data quality** is among the top 3 use cases for 35% of organizations.



In total, 46% of respondents reported that **data volume and confidence in the data are among the top critical factors** in successful AI adoption.



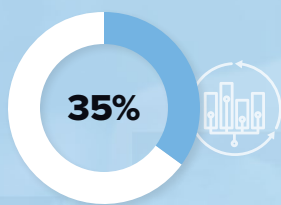
Nearly 26% of respondents reported **lack of adequate volumes of quality training data, concern over trustworthiness/bias of data, and limited access to computing resources** as key barriers to success in AI.

The heterogeneity of data sources, incomplete and duplicate data, and the lack of standards are all barriers to creating an enterprise data platform to feed AI.

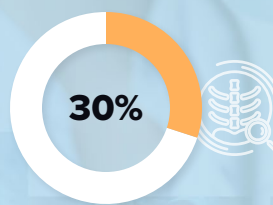
# Use Cases Across Clinical, Operational, and Analytic Domains

Research grants were an early funding source for AI initiatives in healthcare; the grants supported innovation in clinical processes and diagnoses and treatment of diseases. As such, AI skills were often limited to academic departments and research results reported in industry journals. The current breadth of use cases across provider domains demonstrates that AI is now moving from grant-funded clinical proof of concept into mainstream clinical, back-office, and operational use cases. Thirty percent of organizations ranked reading images to assist with diagnoses among their top 3 use cases. The *AI in Healthcare Survey* found that some use cases are in production in only 20–30% of organizations today, though estimates for year-end 2020 and 2021 show acceleration. German providers, in many cases, have a higher percentage of use cases in production than providers in the United States or the United Kingdom. Near-term plans in the United States and United Kingdom indicate that healthcare providers in these countries will catch up to their German counterparts in the next few years.

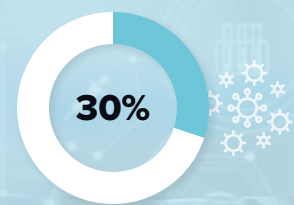
## The top 3 use cases for AI in healthcare overall are:



**Inferencing to improve data quality**



**Reading images to assist with diagnoses**



**Early identification of hospital-acquired infection**

## Use of AI algorithms to read images to assist with diagnoses by country now versus end of 2023:



**Germany**



**United Kingdom**



**United States**

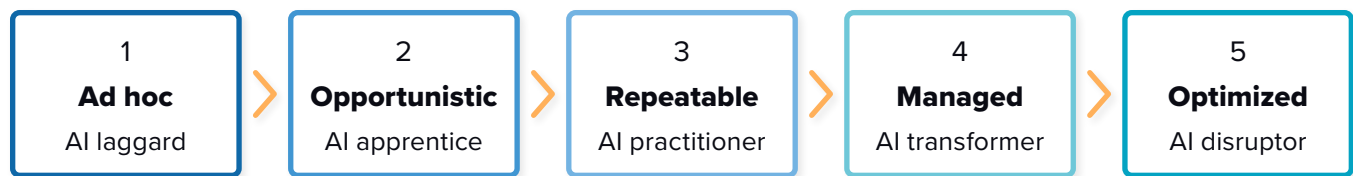
# Situation Overview

## Healthcare Providers Less Mature in AI Adoption Than Organizations in Other Industries

IDC developed a five-stage Maturity Model that is used to evaluate technology adoption (see Figure 1). In 2019, IDC conducted a multisector benchmark survey of 253 United States-based companies and established that 59% of respondents were in the opportunistic category for AI maturity.<sup>1</sup>

**FIGURE 1**

### IDC MaturityScape Stages for Artificial Intelligence



While the same benchmark data is not available for the healthcare provider market, IDC believes most healthcare organizations are closer to the ad hoc stage but moving toward the opportunistic stage. Several factors lead to this conclusion. In the ad hoc stage, funding is typically on a project basis, and there are no new processes or staff in place. The *AI in Healthcare Survey* found that 53% of respondents have AI frameworks in place while the remaining 47% anticipate a 24-month horizon before they will be in production. In addition, over 30% of respondents indicated grants as the primary source of funding. Without an AI framework in place, healthcare organizations can deliver only project-based AI initiatives rather than enterprise-level AI initiatives.

1. IDC's *Artificial Intelligence MaturityScape Benchmark Survey*, 2019

There are indicators that healthcare providers are moving toward the *opportunistic* stage, which is characterized by established processes and project management. Healthcare providers' growing maturity was uncovered in the *AI in Healthcare Survey*, as 67% of respondents indicated that they have a rigorous, multidisciplinary team in place to make funding decisions. In addition, operational foundations are emerging as 58% of organizations have AI-specific data governance and management policies and procedures in place. Germany reported 69% of organizations with AI-specific data governance and management policies in place, the United Kingdom reported 57%, and the United States reported 53%.

These data points indicate that an organizational infrastructure is being put in place that addresses the unique requirements, safeguards, and management structure required for AI to be successfully deployed at the enterprise level.

### Best Practices:

Organizations adopting AI should have specific corporate policies and procedures for data governance and management of all AI initiatives, have a chief data officer or an equivalent position accountable for AI initiatives, and conduct routine review of policy and procedure.

## Germany Ahead in AI Adoption

Results from the *AI in Healthcare Survey* reveal that German hospitals are leading other hospitals in the development and adoption of AI (see Table 1).

**TABLE 1**

### Germany Outpacing United Kingdom and United States (% of Respondents)

| Example                                                               | Germany<br>(n = 54) | Total<br>(n = 210) |
|-----------------------------------------------------------------------|---------------------|--------------------|
| Exceed peers and best in class for leveraging AI                      | 43%                 | 35%                |
| AI frameworks in production                                           | 61%                 | 53%                |
| AI-specific data governance and management policy in place            | 69%                 | 58%                |
| Algorithms in place that use AI to read images to assist in diagnoses | 52%                 | 24%                |

Source: IDC's *AI in Healthcare Survey*, May 2020

While this data should be considered directional because of sample size, there is additional evidence that Germany is ahead of other countries in its ability to leverage AI to transform business.

### IDC analysts in Europe, the Middle East, and Africa (EMEA) identified some of the drivers of maturity in Germany as follows:

- For the past three years, the German government has been setting the foundation to become a European hub of research and innovation in AI. There has been significant national and regional funding and investments focused on academia. Acceleration projects and experimentation with machine learning in multiple sectors including healthcare have occurred.

- **Regulation and best practices around data management and security** have driven Germany in AI adoption as well. On November 7, 2019, the German national legislature passed new rules supporting digital innovation in Germany—the Digital Healthcare Act—extending the use of social and healthcare data for research purposes to public authorities, research institutes, and university hospitals. To make national healthcare data more accessible to research and public health planning, the government is implementing a National Trust Center and Research Data Center that will anonymize and analyze data while ensuring full compliance with the General Data Protection Regulation (GDPR) and data security regulations. With this piece of legislation, Germany is one of the few countries in Europe that has regulated secondary use of healthcare information in greater detail. The volume of data that will be available through the Research Data Center may meet the requirements for the volume and quality of data for AI algorithm training.
- The hospital market in Germany is highly competitive and as such has **prioritized patient experience and outcomes**. Seventy percent of German respondents in the *AI in Healthcare Survey* indicated patient satisfaction/engagement among the top 3 drivers of AI initiatives. While patient satisfaction/engagement is a corporate priority for hospitals in the United States and the United Kingdom, only 48% of U.S. respondents and 49% of U.K. respondents identified it as one of the top 3 drivers of AI initiatives.

## Drivers of AI

The opportunities to leverage AI for innovation, process improvement, patient and physician satisfaction, and patient outcomes improvement have never been greater. The time is ripe to extend AI beyond academic discovery and democratize access across the healthcare provider ecosystem. This is especially true as healthcare organizations are participating in clinical research. For example, MIT and Harvard researchers teamed up with clinicians at Beth Israel Deaconess and Massachusetts General Hospital to evaluate the effectiveness of automated evaluation of lymph node tissue in patients with breast cancer versus results from pathologists. The automated diagnostic method was accurate 92% of the time; pathologists alone were accurate 96% of the time. The combination of findings from the automated approach and pathologists' findings achieved an accuracy rate of 99.5%. This represents a significant reduction in errors.<sup>2</sup> In this example, democratization occurs when healthcare organizations establish new processes and policies that govern the use of AI in the evaluation of lymph node tissue for breast cancer patients. Change management is crucial to widespread adoption of AI.

In the *AI in Healthcare Survey*, 54% of hospitals identified patient satisfaction/engagement among their top 3 drivers of AI adoption, typically using a pilot approach to early deployment, which makes wider deployment far easier. This is consistent with results from IDC's 2019 *U.S. Healthcare Provider Technology and Services Survey*, where improved customer experience and engagement was among the top priorities for U.S. hospitals, and 87% of hospitals indicated their technology spend would increase in this area.<sup>3</sup> It should be noted

2. Stacy Lawrence, Harvard, MIT researchers harness deep learning for more accurate breast cancer pathology, June 2016. See [www.fiercebiotech.com/medical-devices/harvard-mit-researchers-harness-deep-learning-for-more-accurate-breast-cancer](http://www.fiercebiotech.com/medical-devices/harvard-mit-researchers-harness-deep-learning-for-more-accurate-breast-cancer).

3. See <https://www.idc.com/getdoc.jsp?containerId=US44973719>.

though that the top driver varies markedly when looked at by country, with clinical process productivity improvements leading in the United States, while diagnostic and treatment insights were of more interest in the United Kingdom (see Table 2).

**TABLE 2****Top Drivers for AI Initiatives by Country**

| Country                 | Driver                                                              | Organizations (%) |
|-------------------------|---------------------------------------------------------------------|-------------------|
| Germany (n = 54)        | Patient satisfaction/engagement                                     | 70%               |
| United States (n = 105) | Improvements of productivity for clinical processes                 | 53%               |
| United Kingdom (n = 51) | Clinical insights/decision support to drive diagnoses and treatment | 57%               |

Source: IDC's *AI in Healthcare Survey*, May 2020

## Barriers to AI Adoption

Respondents to the *AI in Healthcare Survey* were also asked what holds back their organization from more extensive use of AI. Not surprisingly, the shortage of data scientists, data engineers, and data modelers was among the top barriers (32% of organizations); there was little variation by country. However, the overall rank of barriers did vary by country (see Table 3).

The shortage of data scientists around the country has been well documented. The August 2018 LinkedIn Workforce Report found that more than 151,000 data scientist jobs were unfilled across the United States, with “acute” shortages in New York City, San Francisco, and Los Angeles.

**TABLE 3****Leading Barriers to AI Adoption by Country**

| Country                 | Number 1 Barrier             | Organizations (%) |
|-------------------------|------------------------------|-------------------|
| Germany (n = 54)        | Explainability of algorithms | 41%               |
| United States (n = 105) | Trustworthiness/bias of data | 33%               |
| United Kingdom (n = 51) | Lack of skilled personnel    | 35%               |
| Total (n = 210)         | Lack of skilled personnel    | 32%               |

Source: IDC's *AI in Healthcare Survey*, May 2020

The shortage of computational skills may well be driving the move toward the use of third-party vendors for the development of AI. Sixty-six percent of the providers in the *AI in Healthcare Survey* indicated that the use of third-party vendors will be their primary development strategy by 2023. A third-party vendor will have multiple data scientists on staff with a broader set of experiences than the one or two data scientists in an individual organization.

It is also important to note that among the top 5 barriers to successful AI adoption, two are related to data: first, trustworthiness/bias of data (28% of organizations) and second, lack of adequate volumes of quality training data (26% of organizations). This may be another driver in the preference to use third-party vendors for development as they typically have testing environments with adequate data.

## Lack of Adequate Volume of Quality Training Data

The poor quality of healthcare data is an age-old problem that continues to derail the use of machine learning and AI. Poor quality data will result in poor insights and drive poor decisions. Healthcare providers are just now, often through a third-party vendor, tackling the meaningful integration of data within and external to their organization.

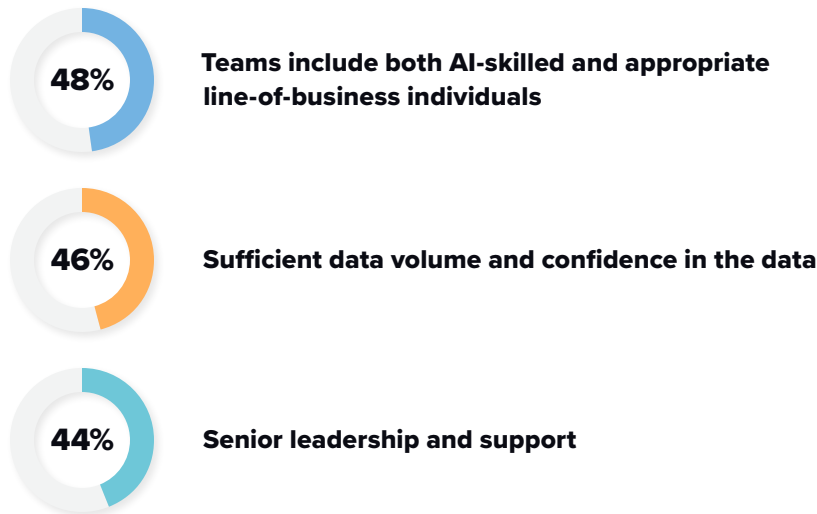
Years of mergers and acquisitions have created an IT environment that can be described only as hyper-heterogeneous. Multiple electronic medical record systems as well as laboratory systems that calibrate results differently must be rationalized, normalized, and harmonized. Missing data, duplicate data, and structured and unstructured data must be cleaned and intelligently incorporated into an integrated longitudinal patient record. Some of the tactics that can be pursued to clean data are integration, patient matching, aggregation, normalization, terminology and data enrichment, and deduplication into a unified care record. Recognizing the challenges of creating clean data, 35% of respondents pointed to the use of AI for inferencing to improve data quality as one of their top use cases.

One of the advantages of AI is its ability to ingest new data sources to improve the precision of the algorithms. The challenge then is in the data preparation. Clean data is required, and the addition of payer and social determinants data comes with its own “dirty data” challenges. Interoperability within an enterprise and increasingly with other health and nonhealth organizations that are part of the ecosystem is a top priority for many organizations.

To provide large volumes of data for AI algorithm training, many high-tech companies such as Google and Microsoft are building large, typically de-identified, data sets. Healthcare providers must be rigorous in their evaluation of the data cleansing and normalization strategies that are being used by these organizations to ensure the data is of high quality.

## Critical Success Factors

Among the top reasons cited as critical success factors are:



## Funding and Staffing of AI Initiatives for Healthcare Providers

Across all industries, funding and decision making for IT are increasingly coming from the line of business. The *AI for Healthcare Survey* found that only 14% of organizations identified line of business as the primary source of funding for AI initiatives. This compares with 41% of respondents indicating that AI initiatives are primarily funded through the annual IT budget. AI may be considered an enterprise IT asset that, based on approved initiatives, allocates budget on a project basis. The early-stage adoption of AI and concerns regarding data bias and ethical issues may drive organizations to centralize funding and management of AI. Seventy-two percent of respondents in the *AI in Healthcare Survey* indicated that funding for existing AI initiatives would increase, while an additional 25% said funding would remain constant. This is balanced by the 30% of organizations that identified the cost of the solution as a barrier to adoption.

The *AI in Healthcare Survey* respondents who indicated that they “exceed peers” or are “best in class” in leveraging AI cited the following best practice: AI funding decisions and development teams should be interdisciplinary and include representation from the business and clinical leadership. Seventy percent of “best in class” and “exceed peers” respondents indicated their organizations include clinical staff on their development teams compared with 53% of “behind peers” respondents.

### Best Practices:

AI funding decisions and development teams should be interdisciplinary and include representation from the business and clinical leadership.

## Development Strategies

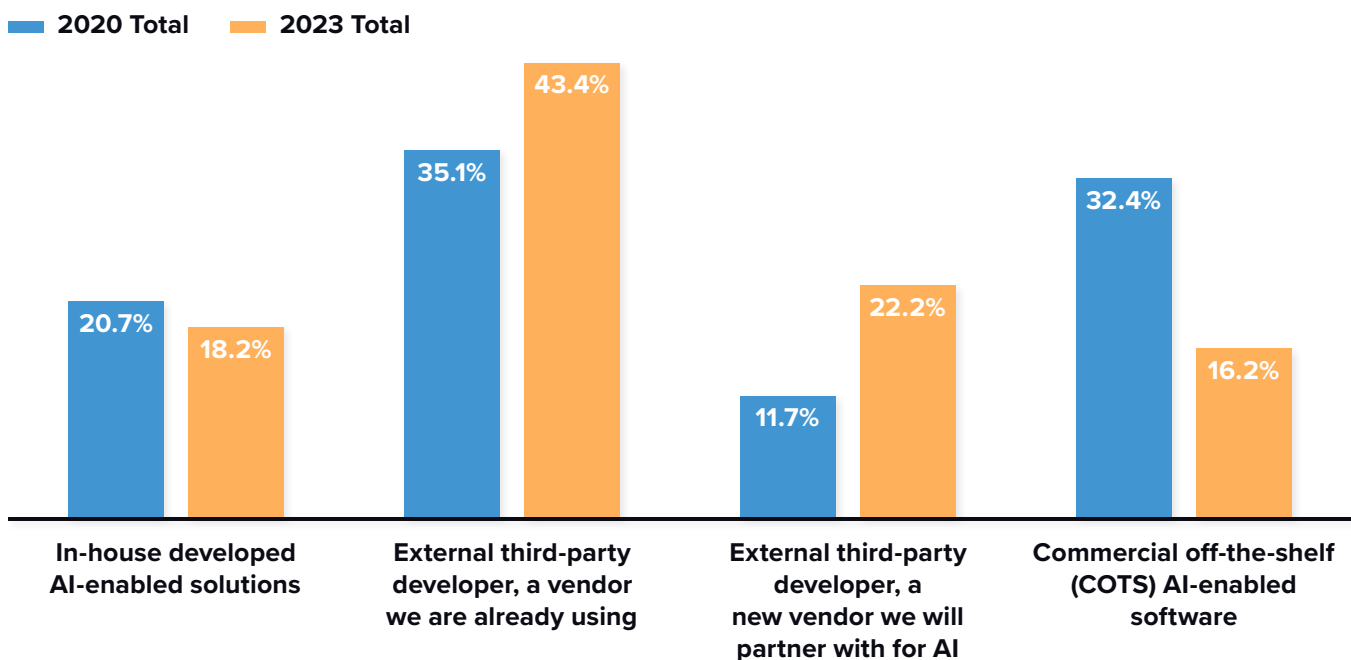
The results of the *AI in Healthcare Survey* show that healthcare providers are increasingly electing to engage a third-party vendor for AI development. For many of the reasons discussed in this paper, most healthcare providers do not have the necessary resources for in-house development. They lack access to data scientists, engineers, data modelers, the necessary volume of quality data for testing, and the expertise to develop clinically oriented algorithms. In addition, respondents to the *AI in Healthcare Survey* identified the lack of access to computing resources among the top 5 barriers to AI adoption. A development model is emerging where third-party vendors are developing, testing, validating, and maintaining AI algorithms on behalf of their clients. While there is obvious customization required as each provider has nuances in data and processes, there is often enough commonality that vendors can reuse the knowledge they gain to the benefit of future clients.

The most dramatic change in deployment strategy from 2020 to 2023 is the expected decline in organizations identifying commercial off-the-shelf (COTS) as their primary development strategy (see Figure 2). The unique nature of an organization's data and the need to tune an AI algorithm for each organization almost defy the definition of COTS. Less than 10% of hospitals in the United States and the United Kingdom indicated that they would be using COTS as their primary development approach in 2023. Interestingly, 38% of German providers indicated that they would be using COTS in 2023.

**FIGURE 2**

### AI Development Strategies

**Q. How would you describe your organization's primary development approach for AI-enabled solutions now and in three years?**



Source: IDC's *AI in Healthcare Survey*, May 2020

## Priority Use Cases Span Clinical, Operational, and Analytic Domains

Respondents were asked to identify the top 3 use cases that represent their organizations' priority for the next three years. There is marked variation by country, which is shown in Table 4. The variation by country reflects both the AI maturity and the culture of the country. For example, organizations in the United States ranked "read images to assist in diagnoses" a lower priority, while other countries ranked it among the top 3. Physicians in the United States are culturally reluctant to introduce AI into clinical practice, and at this time, there is no shortage of radiologists, so there is little incentive to adopt AI for this use case. Keep in mind that the distribution of organizations across countries is not equal and that results are skewed because the United States represents nearly one-half of the sample size.

**TABLE 4**

### Top Use Cases by Country (% of Respondents)

| Use Cases                                           | Total<br>(n = 210) | Germany<br>(n = 54) | United States<br>(n = 105) | United Kingdom<br>(n = 51) |
|-----------------------------------------------------|--------------------|---------------------|----------------------------|----------------------------|
| Inferencing to improve data quality                 | 35%                | 41%                 | 37%                        | 26%                        |
| Read images to assist in diagnoses                  | 30%                | 39%                 | 27%                        | 28%                        |
| Early identification of hospital-acquired infection | 30%                | 22%                 | 34%                        | 29%                        |
| Patient risk stratification                         | 27%                | 26%                 | 30%                        | 24%                        |
| Predict adverse events                              | 25%                | 35%                 | 20%                        | 26%                        |
| Improve back-office productivity                    | 25%                | 24%                 | 24%                        | 28%                        |
| Forecast hospital patient admission                 | 23%                | 19%                 | 28%                        | 20%                        |
| Supply chain                                        | 23%                | 20%                 | 27%                        | 20%                        |
| Early identification of sepsis                      | 22%                | 19%                 | 17%                        | 35%                        |
| Chatbots for patient education and coaching         | 21%                | 28%                 | 14%                        | 28%                        |

Source: IDC's AI in Healthcare Survey, May 2020

The relative priority of use cases distributes fairly consistently by country.

It was reassuring to note that the top use cases were spread across clinical, operational, and analytic domains, which indicates the democratization of AI across the provider organization.

The *AI in Healthcare Survey* asked respondents the status of deployment for the use cases. The analysis in the sections that follow provides detail on the status of use case deployment for three use cases based on percentage of organizations.

## Inferencing to Improve Data Quality

The heterogeneity of data in healthcare requires enormous efforts to harmonize, clean, and integrate. AI requires data volume and quality to be accurate. There are often issues of inconsistent data on an individual across healthcare applications, and data is often thought to be missing; however, through inferencing, a diagnosis can be determined, for example. Clearly, the healthcare providers that completed the survey understood the data requirements for AI and are taking steps to improve data quality (see Table 5).

**TABLE 5**

**Country Comparison: Use of Inferencing for Data Quality (% of Respondents)**

| Status                        | Germany | United Kingdom | United States |
|-------------------------------|---------|----------------|---------------|
| Algorithm in place            | 41%     | 23%            | 23%           |
| Algorithm deployed in 2020    | 23%     | 31%            | 41%           |
| Algorithm deployed after 2020 | 18%     | 23%            | 23%           |

Source: IDC's *AI in Healthcare Survey*, May 2020

The heterogeneity of data in healthcare requires enormous efforts to harmonize, clean, and integrate. AI requires data volume and quality to be accurate.

## Read Images to Assist with Diagnoses

The application of AI in imaging was limited to grant-funded academic research for many years, especially in developed countries where government approval is required to commercialize a product. In the United States, any medical device that uses AI must be approved by the Food and Drug Administration (FDA); it took several years for the FDA to begin approving the application of AI in imaging. The approval process appears to be proceeding as the FDA has become more comfortable working with AI in medical devices. Fifty-two percent of German respondents have algorithms deployed, and the United Kingdom and the United States will catch up in the next few years (see Table 6).

**TABLE 6**

**Country Comparison: Use of AI to Read Images to Assist with Diagnoses (% of Respondents)**

| Status                        | Germany | United Kingdom | United States |
|-------------------------------|---------|----------------|---------------|
| Algorithm in place            | 52%     | 7%             | 11%           |
| Algorithm deployed in 2020    | 38%     | 36%            | 57%           |
| Algorithm deployed after 2020 | 10%     | 36%            | 21%           |

Source: IDC's AI in Healthcare Survey, May 2020

## Early Identification of Hospital-Acquired Infection

Depending on the country, province, or state, the implications of hospital-acquired infection vary. In the United States, for example, select infections must be reported to the Centers for Disease Control and Prevention (CDC), and a local department of public health may decide to investigate a hospital based on reported cases. Depending on how the hospitals are reimbursed, the additional cost associated with treating a hospital-acquired infection may not be covered. Reputational risk must also be considered if a hospital's infection rate is made public (see Table 7).

**TABLE 7**

**Country Comparison: Use of AI in Early Identification of Hospital-Acquired Infection (% of Respondents)**

| Status                        | Germany | United Kingdom | United States |
|-------------------------------|---------|----------------|---------------|
| Algorithm in place            | 25%     | 13%            | 28%           |
| Algorithm deployed in 2020    | 50%     | 53%            | 42%           |
| Algorithm deployed after 2020 | 17%     | 27%            | 17%           |

Source: IDC's AI in Healthcare Survey, May 2020

# Essential Guidance

**The following guidance is a combination of the results of the *AI in Healthcare Survey* and IDC's experience:**

- **Establish an AI strategy for your organization before you make technology investments.** Becoming an AI-first organization takes a very different strategy and subsequent investments than consuming AI incrementally as business needs arise.
- **Understand and address data quality issues,** and ensure you have adequate volume of data to train AI models. Third-party vendors should provide data quality expertise and often have data available for testing.
- **Balance the art of the possible with the art of the permissible,** which is highly dependent on cultural norms and historical practices of healthcare providers. This is evident when looking at the variation in use case priorities by country.
- **Start deploying AI to use cases that represent the low-hanging fruit** such as predicting the likelihood of readmission. Avoidance of readmission is good for the patient and good for the institution. Stay away from “sacred cows,” particularly those that impact clinical practice.
- **Give everyone a voice in the process of developing and deploying AI.** Even the most skeptical should be involved, and AI initiatives must be joint efforts between IT and the lines of business.
- **Recognize that the introduction of AI will bring about change,** and be prepared to embrace change management.

# Methodology

**FIGURE 3**

## Demographics of Respondents

### PRIMARY PROVIDER TYPE

|                                  |       |
|----------------------------------|-------|
| Hospital/health system .....     | 48.1% |
| Academic medical center .....    | 26.2% |
| Community hospital .....         | 21.4% |
| Integrated delivery system ..... | 4.3%  |

### BED SIZE

|                 |       |
|-----------------|-------|
| 300–499 .....   | 11.0% |
| 500–699 .....   | 15.0% |
| 700–899 .....   | 22.0% |
| 900–1,099 ..... | 36.0% |
| >1,099 .....    | 16.0% |

### REGION

|                      |       |
|----------------------|-------|
| United States .....  | 50.0% |
| Germany .....        | 26.0% |
| United Kingdom ..... | 24.0% |

### PEER COMPARISON

|                             |       |
|-----------------------------|-------|
| Far behind our peers .....  | 8.6%  |
| Lag our peers .....         | 23.8% |
| At par with our peers ..... | 32.9% |
| Exceed our peers .....      | 25.7% |
| Best in class .....         | 9.0%  |

### ROLES IN AI

|                                 |       |
|---------------------------------|-------|
| Part of the strategy team ..... | 56.0% |
| Manage the developer team ..... | 28.0% |
| Developer .....                 | 18.0% |

### RESPONDENTS

|                   |       |
|-------------------|-------|
| IT director ..... | 42.0% |
| CMIO .....        | 17.0% |
| VP IT .....       | 13.0% |
| Other .....       | 28.0% |

### DECISION AUTHORITY

|                         |       |
|-------------------------|-------|
| IT influencer .....     | 64.0% |
| IT decision maker ..... | 29.0% |
| IT knowledge .....      | 7.0%  |

Source: IDC's AI in Healthcare Survey, May 2020 | n = 210

# About the Analyst



**Cynthia Burghard**

**Research Director**

**Value-based Healthcare IT Transformation Strategies, IDC**

Cynthia is responsible for the value-based healthcare practice. A key focus of her research includes the use of cognitive/AI technologies to advance digital transformation in healthcare. Areas of research include analytics, population health workflow, proactive patient engagement including patient personal assistants.

[More about Cynthia Burghard](#)

# Message from the Sponsor

The poor quality of healthcare data is an age-old problem that continues to derail the use of machine learning and AI. Poor quality data will result in poor insights and drive poor decisions.

Healthy data is data that has been unified, cleaned, and is ready for action. InterSystems makes healthy data available, usable, governable, and actionable to organizations and individuals throughout the healthcare ecosystem via multiple platforms. With 1,700 employees worldwide, InterSystems puts unified, clean, healthy data to work for you.

[Learn more about healthy data](#)

## About IDC

International Data Corporation (IDC) is the premier global provider of market intelligence, advisory services, and events for the information technology, telecommunications, and consumer technology markets. IDC helps IT professionals, business executives, and the investment community make fact-based decisions on technology purchases and business strategy. More than 1,100 IDC analysts provide global, regional, and local expertise on technology and industry opportunities and trends in over 110 countries worldwide. For 50 years, IDC has provided strategic insights to help our clients achieve their key business objectives. IDC is a subsidiary of IDG, the world's leading technology media, research, and events company.

## IDC Custom Solutions

This publication was produced by IDC Custom Solutions. The opinion, analysis, and research results presented herein are drawn from more detailed research and analysis independently conducted and published by IDC, unless specific vendor sponsorship is noted. IDC Custom Solutions makes IDC content available in a wide range of formats for distribution by various companies. A license to distribute IDC content does not imply endorsement of or opinion about the licensee.



### **IDC Research, Inc.**

5 Speen Street  
Framingham, MA 01701  
USA  
508.872.8200

[idc.com](https://www.idc.com)

 [@idc](https://twitter.com/idc)

---

Copyright 2020 IDC. Reproduction is forbidden unless authorized. All rights reserved.

### **Permissions: External Publication of IDC Information and Data**

Any IDC information that is to be used in advertising, press releases, or promotional materials requires prior written approval from the appropriate IDC Vice President or Country Manager. A draft of the proposed document should accompany any such request. IDC reserves the right to deny approval of external usage for any reason.

IDC Doc. #US46919920