

Insights Series

Issue 16
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The New
Normal

Who are the leaders in digital health and what can we learn from them in times of COVID-19?

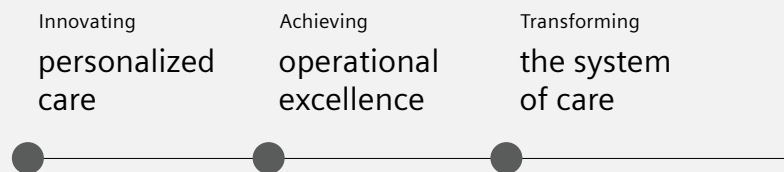
A thought leadership paper on “Transforming the system of care”
and “Achieving operational excellence”

Preface

The Insights Series

The Siemens Healthineers **Insights Series** is our preeminent thought leadership platform, drawing on the knowledge and experience of some of the world's most respected healthcare leaders and innovators. The Series explores emerging issues and provides you with practical solutions to today's most pressing healthcare challenges.

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Introduction

Digitalization continues to transform our world. The industries at the forefront of the digital transformation – retail, communication, travel, entertainment – began to move boldly down this path a full quarter century ago, when the first browser appeared on the commercial internet. Many of these ventures realized significant benefits from their “early adopter” status. The healthcare sector was, however, slower to embrace this new development, due to a combination of financial, regulatory, cultural and technological reasons. Yet in terms of digital adoption healthcare is now rapidly catching up.

There are three essential reasons why healthcare is now making up lost ground. First, medical technology is advancing at a remarkable pace: everything from smart wearables to extraordinary leaps in fields like robotic surgery are making digital processes easier, safer and more affordable. Second, patient demand. Patients are increasingly approaching healthcare services as “consumers”, expecting the same level of convenience and personalization they have come to expect in other areas of their lives. Finally, external factors have made the shift to digitalization not only desirable but in many cases urgently necessary. The COVID-19 pandemic immediately made digitalization a top-of-mind issue at every level of the healthcare industry, both as strategy to remain viable during the crisis and simply because of health concerns, i.e., mitigating the risks of exposure to a deadly and unknown virus.

The digital healthcare transformation is proceeding at a brisk pace. Prior to the pandemic, digitalization was already well underway, and COVID-19 has accelerated this trend further. More than 80 percent of hospital CEOs stated that investments in digital tools and systems has changed significantly as a result of the pandemic. In the U.S., this number is greater than 90 percent.*

According to data from a survey prepared and conducted by The Economist Intelligence Unit, which was sponsored and then analyzed solely by Siemens Healthineers, hospital CEOs indicated that many of these investments have been in the area of upgrading electronic communications between healthcare professionals – things like e-communication tools and apps – mentioned by 57 percent of respondents. Tools to use e-prescriptions were named by 51 percent; e-observation tools for ward patients by 50 percent. Other high responses were in the areas of improved capacity for storage of patient records (47.5%); and the use of digital triage as a first approach for identifying and prioritizing patients arriving at emergency rooms (46%). Improved interoperability of digital data between secondary and primary care providers was also named by 46 percent of respondents, and greater use of telemedicine or e-consultations with patients was close behind at 45 percent.

Yet important questions remain. Will these digital changes be sustainable, post-COVID? Will the necessary legal and regulatory frameworks be updated to accommodate, for example, new reimbursement models, liability questions, and licensing issues?

On a more elementary level, are digital investments being made in the right places? Are they generating the desired results? What do the decision-makers, hospital CEOs, see as the greatest advantages of digitalization – and what are the greatest obstacles?

Who are the leaders in this digital journey, and what can we learn from them?

These are some of the questions Siemens Healthineers set out to answer through a global survey of healthcare leaders which was prepared and conducted by The Economist Intelligence Unit. The results of this survey offer an illuminating new perspective on some of the most fundamental issues facing healthcare in this time of unprecedented change and disruption.

*Siemens Healthineers analyzed raw data from a survey prepared and conducted by The Economist Intelligence Unit

The challenge

Digitalization has been on the radar screens of all healthcare leaders for some time now. Yet, it has rarely received the attention and resources necessary to unlock its full potential. According to a study conducted by PricewaterhouseCoopers in 2018 (before COVID transformed the healthcare landscape), 38 percent of the senior healthcare executives surveyed indicated that digitalization was not part of their overall corporate strategy¹. The same study also indicated that only 21 percent of healthcare companies employed a Chief Digital Officer, compared to 32 percent of banks and 41 percent of insurance companies¹. Money was being spent, yet many healthcare leaders were of the view that these investments were not justified by actual results – return on investment (ROI).

Clearly, more information is needed about what digitalization can, and cannot, do, and how these goals can be realized.

The four components of digitalization in healthcare

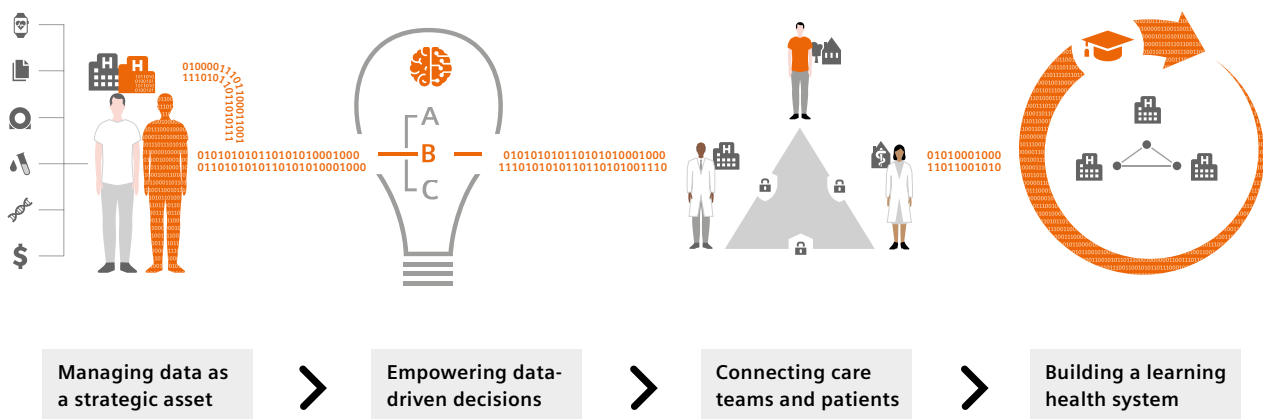
An analysis of digitalization within the healthcare sector must begin by addressing the basic question: what is digitalization in healthcare? Digitalization of healthcare occurs in four areas of activity, each with its own priorities and requirements.

First, providers must manage data as a strategic asset. This demands new hardware, software, as well as a cultural shift. Data must be integrated from multiple sources, like wearables, imaging, diagnostic laboratory, and genetics. Broader, external social determinants must also be included. Information from payors plays a crucial role as well. All of this must be accessible on secure and easily reachable data platforms. The benefits of this shift are clear. By managing data as a strategic asset, providers will gain unprecedented insight into clinical and non-clinical processes.

Second, digitalization must empower data-driven decisions. With the help of powerful analytical tools such as AI-technologies, digital data can lead to better decision-making along every step of a patient's care pathway. In the clinical or operational space, caregivers will have access to a more complete picture of individual patients, guiding their medical decisions. And patients themselves will be better informed, with reliable and relevant information, helping them to make the right choices at the right time.

Third, digitalization must be utilized to connect care teams and patients. The bonds between patients and their care teams can be made stronger, safer, easier and quicker through the use of digital tools and technologies that bridge physical distances and help to unify fragmented systems of care. Accordingly, healthcare providers will increasingly embrace the concept of “moving information, not patients.” Home monitoring and secure tele-consultation technology will enable some patients to receive hospital quality care while at home; this shift to home care will be enabled by digital decision support tools that can more accurately identify candidates for home-based outpatient care. Through remote care and telehealth, patients will gain more transparency into their own care, and become more active participants in their own care and the prevention of disease.

Fourth, digitalization must be used to build a learning health system. Data-gathering must continually improve. At the same time, as more data is gathered, the value of this data increases exponentially, allowing greater insights as well as a better understanding of how, why, and what data should be collected. Rigorously measuring and disseminating patient outcomes will serve as the basis for course correction and will make it possible to identify and scale the right measures for optimizing, expanding and advancing enterprise performance. In this way, a true learning health system will be better prepared for both “routine” care and for extraordinary circumstances such as responding to new viral outbreaks or other infectious disease events or public health crises.



The survey

Survey methodology

The Economist Intelligence Unit prepared and conducted the survey and submitted the raw data to Siemens Healthineers. The description and analysis of the survey results is the sole work of Siemens Healthineers and did not involve The Economist Intelligence Unit.

The survey comprised 12 questions sent to 269 C-level healthcare leaders from ten countries: the U.S., Brazil, France, Germany, the UK, Spain, Italy, Australia, China, and Japan. For each of the questions, respondents were asked to give a rating from 1 to 10, and an average rating was calculated for all respondents from the same country.

Survey results

The first question in The Economist Intelligence Unit survey was designed to identify the ultimate goal of digitalization in each of the ten countries.

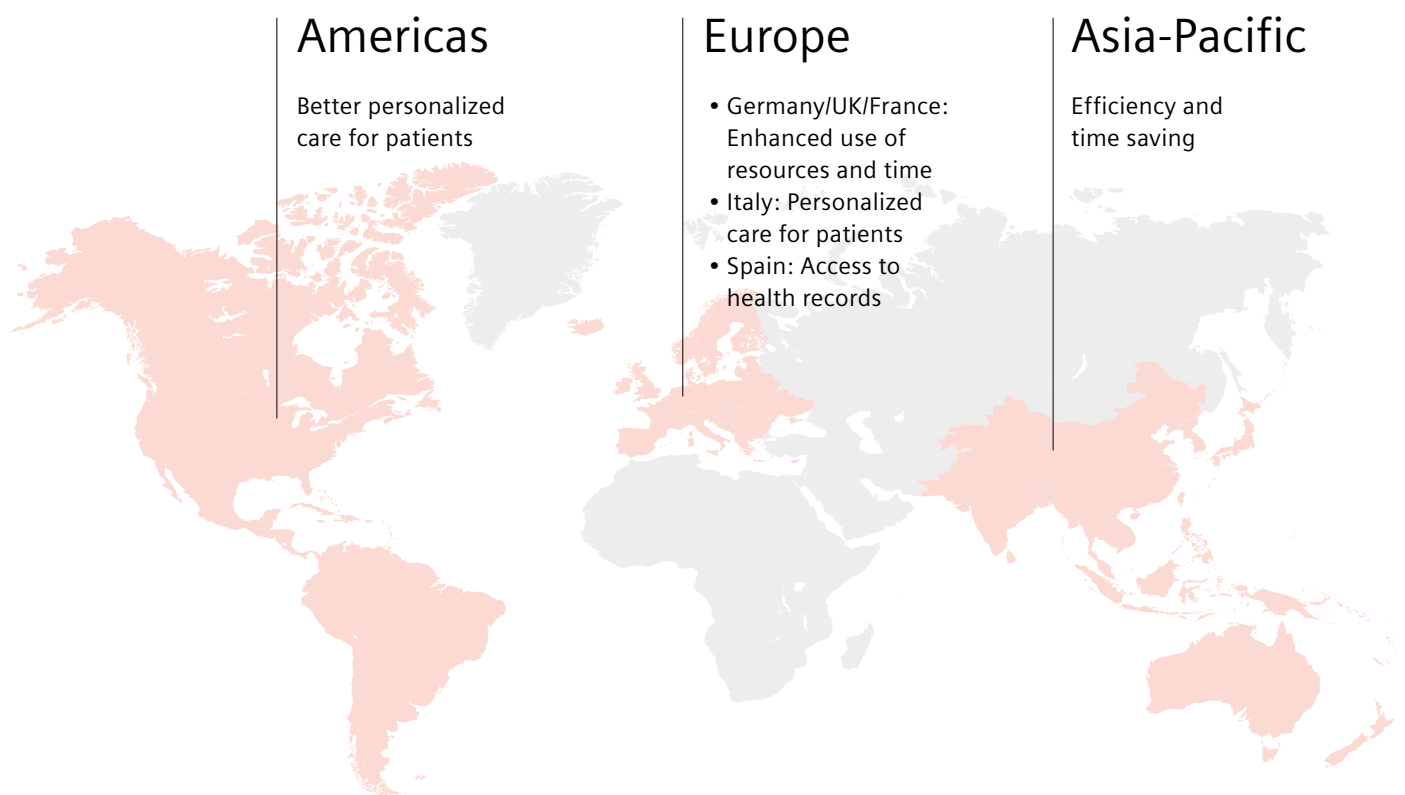
It asked, “What are the greatest advantages of improved digital health solutions in a hospital environment?” The results revealed interesting and noteworthy differences.

In the U.S. and Brazil, the greatest advantage was an outcome-focused goal: better personalized care for patients, supported by 49 percent of respondents. The shift to value-based healthcare delivery model, where providers are paid based on patient health outcomes, could be the reason behind this observation. The second and third most beneficial advantages received significantly less support and were both related to efficiency gains: enhanced use of resources (39%), and time savings for healthcare professionals (31%).

In Asia, the results painted a different picture. Here, efficiency was rated highest, with time saving for healthcare professionals receiving the greatest support (41%). Compared to the U.S., China only has one-third the number of nurses for every 1,000 people². This was closely followed by outcome topics including personalized care for patients (40%), and a better understanding of patient clinical history and management (38%).

In Europe, the differences between countries were significant. The primary goal in Germany and the UK (47% and 43%, respectively) was the enhanced use of resources. In France, time saving for healthcare professionals was rated highest. In Italy, better personalized care for patients was rated number one (44%), while in Spain, timely access to personal health records for patients was rated highest (44%).

What C-level leaders think is the greatest advantage of digitalization



Interestingly, Spain was the only country where more than a third of respondents believed that digitalization contributed to significant budgetary savings. In all other countries, not many believed in budgetary savings. While digitalization can save costs in delivering care down the road, there are investments that hospitals need to make to fully digitalize their organization, such as revamping their IT infrastructure, recruiting digital expertise, and investing in new digital tools. This could help to explain why it is not perceived to be a contributor to budgetary savings.

A more interesting and contemporary perspective on this issue was provided by placing these questions into the context of the current pandemic. What impact has COVID-19 had on the pace or scope of digitalization? What have been the highlights – and lowlights? From whom can we learn, and what challenges remain?

In order to evaluate responses more accurately, the various measures identified by the Economist Intelligence Unit survey were clustered by Siemens Healthineers into four distinct fields.

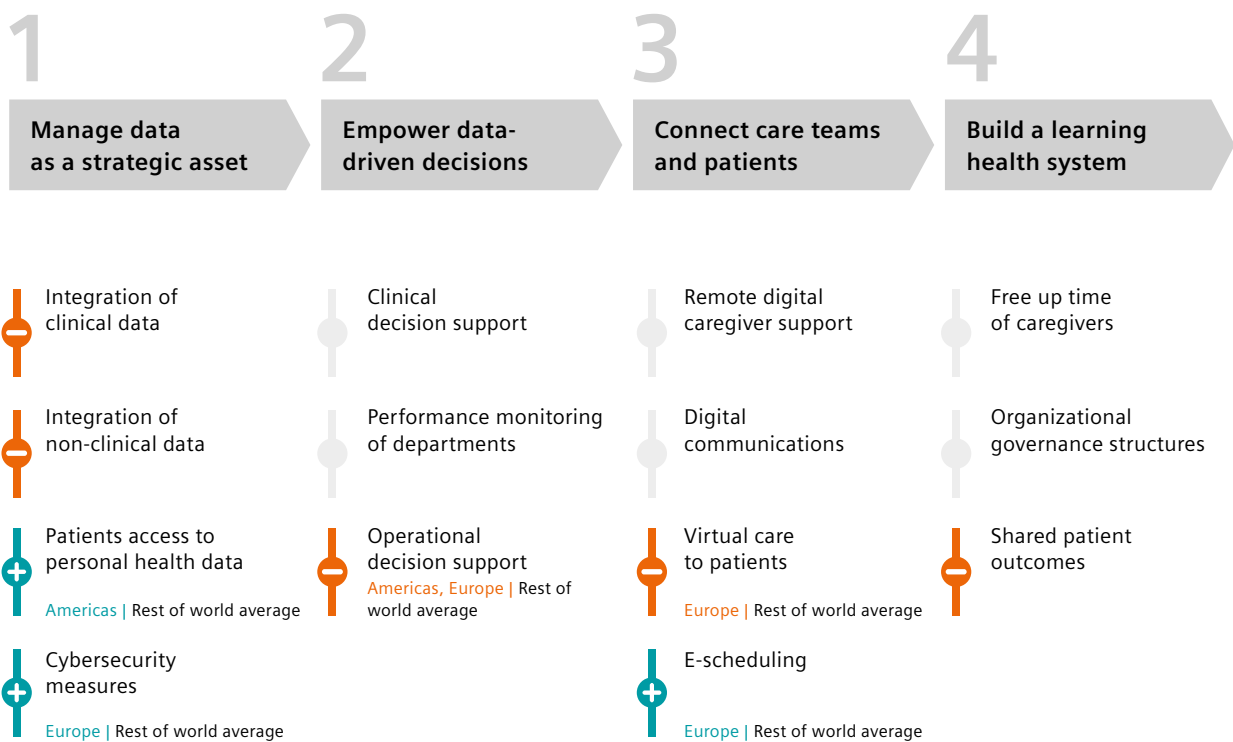
1. Managing data as a strategic asset
2. Empowering data-driven decisions
3. Connecting care teams and patients
4. Building a learning health system

Overall, with an average rating of greater than 7.2 across all ten countries, today's healthcare leaders have a positive view on the digitalization of their health systems (see appendix A). Based on their self-assessment, Asian countries are the most confident about their digitalization efforts (average rating of 8.3), followed by the Americas (average rating of 8.1). European countries are most critical of their digitalization efforts (average rating of 7.6).

However, as the absolute ratings from self-assessment could be impacted by respondent and cultural bias, the relative rating results (i.e., the percentage deviation from the averages per country) are a more accurate guide for evaluating how C-level leaders think about their relative performance in digitalizing their health systems (please see appendix B for details).

Summary of results: How C-level leaders think about their relative performance in digitalizing their health systems: The integration of clinical and non-clinical data and patient outcome sharing are seen most critically globally.

How would you rate the status of digital technology implementation/readiness of your hospital?



+ Higher than regional average +/- around regional average - Lower than regional average

Source: The Economist Intelligence Unit surveyed 269 C-level decision-makers from 10 countries: See Appendix B for details on questions.

1. Manage data as a strategic asset

Respondents from all ten countries in this survey agree that the most fundamental part of digitalization, namely, to appropriately manage the massive influx of data, is also the most challenging. For more personalized patient management, data from sources such as socioeconomic situations, payroll, living conditions, etc. would be valuable for providing clinicians a holistic view of the patient. However, due to data security or privacy reasons in Europe, or interoperability issues in other parts of the world, non-clinical data seems to reside in an isolated island in the health system. Particularly in Germany, respondents rated -16 percent in this area compared to their average digitalization rating. Germany's Digital Care Act (DVG), which supports and further accelerates the digitalization of the country's healthcare system, was only passed by the parliament in December 2019. Other parts of the world also show a drop in their performance rating when it comes to integrating non-clinical data. When it comes to integrating clinical data, Australia and Japan also rated themselves lower than their digitalization average, at -10 percent and -3 percent respectively. The overall challenge of data integration seems to be the bottleneck that holds most providers back from better data-driven decision making.

Not only does data need to be integrated, it also needs to be protected. Data privacy and security is especially critical in the healthcare industry. Countries vary in their assessment of current cybersecurity measures, with Germany rated highest with +13 percent compared to its average rating of digitalization. Other European countries like Italy and France also self-assessed their performance in data security relatively high. ENISA, the European Union Agency for Cybersecurity, has been working to make Europe cyber secure since 2004. It has also launched an eHealth Security experts group to promote data security in the healthcare sector³.

Countries such as the U.S. and Brazil, however, view their cybersecurity measures critically with -4 percent and -2 percent, respectively, which is lower than the ratings of Asia-Pacific countries. According to the U.S. Healthcare Data Breach statistics, 70 percent of the US population has been affected over the past decade and the country has seen a 2,733 percent increase in healthcare data breaches⁴. While there were already some rules around data protection in Europe beginning in the 1970's, a discussion of privacy and data protection by Brazilians authorities came much later⁵.



European healthcare providers gave the highest relative ratings on cybersecurity and e-scheduling

2. Empower data-driven decisions

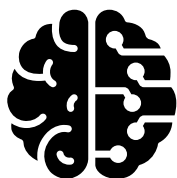
When data is secure and accessible, hospitals can harness its power for monitoring, as well as supporting their operational and clinical decision-making. Across the world, hospitals seem to have a fair adoption of digital analytical tools to monitor the performance of their departments, as evidenced by the average ratings compared to other areas of digitalization.

It is rather in operational decision support that assessments are more diverse. While Australia is rated highly when it comes to using data for operational decision-making, countries such as Brazil, France, Germany, Italy, and the U.S. rated themselves as lacking behind relative to other areas of digitalization. In terms of clinical decision support, Australia again gives a high rating. The UK and the U.S. also rated themselves positively.

3. Connect care teams and patients

What about delivering care to patients using digital tools? Interacting with patients in their homes using virtual care is still a challenge in many countries. Germany and France rated their virtual care capabilities significantly below their country averages with -16 percent and -7 percent, respectively. Until 2018, remote consultations in Germany were not allowed⁶, as compared to its neighbor Switzerland, where telemedical treatment has been available for more than a decade ago⁷. Germany's recent Digital Care Act is set to bring new opportunities to accelerate efforts to digitize and innovate.

Germany also rated low in remote digital tools to support caregivers, as compared to Brazil, where C-level decision-makers rated it as working comparably well (+6%). However, when it comes to tools for e-scheduling and using digital tools for team communication, both Germany and France perform well with positive ratings.



Healthcare providers in Australia, the UK, and the U.S. have a positive assessment on using clinical decision support tools

4. Build a learning health system

For health systems to continuously learn and effectively course correct their digitalization strategies, it is important that patient outcomes are shared across the care continuum. Yet there is not a country where the C-Suites believe this effort is well underway. C-level leaders from seven out of ten countries surveyed perceive the implementation of shared patient outcomes dashboard as below average. However, some countries are optimistic because they believe that at least the organizational governance structures are already in place to support further digital transformation efforts, such as Germany, Australia, and the U.S.

Which country is leading the pack in the digitalizing healthcare self-assessment? From whom can the world learn from according to the perspective of C-level decision-makers? China, the Eastern digitalization powerhouse, has the highest self-assessment ratings across the board in absolute number (please see appendix A for the absolute ratings across all countries). China has been facing challenges of doctor shortages and poor access to healthcare in rural areas. The use of digital tools is one of their key strategies to overcome this. For example, there is already an emergence of innovative healthcare companies such as Ping An Good Doctor which enables 346 million users to access healthcare⁸. Patients can even get their prescriptions from the attached smart vending machine through its a one-stop healthcare ecosystem platform.

While each country has different strengths, all countries have best practices to share in different categories. For example, for supporting caregivers using remote digital tools (e.g. e-learning or physician teleconsultation), Brazil is ahead of others in its self-assessment. One reason for this could be that Brazil offers 3D digital interactive environments to improve education and training of caregivers in order to interact with them as a game to improve the daily care services tasks since 2016⁹.

For cybersecurity, one can look to health systems in Germany (+13% vs. country average), Italy, or Australia for expertise. Spanish healthcare providers offer sound approaches in E-scheduling of appointments with a rating of 11 percent against country average, while French health providers can offer insights in using digital tools to free up time. When it comes to using clinical decision support tools to optimize patient outcomes, healthcare providers in the UK rate comparably high. Finally, for best practices in the challenging topic of data integration from non-clinical platforms, healthcare providers from Japan are the only ones who rated this category higher than its country average.



Healthcare providers in China give the highest self-assessment ratings overall – in absolute numbers

The next steps in digitalizing healthcare

Digital technologies have proven to be invaluable in helping health systems around the world weather the COVID-19 storm. The pace at which digital technologies are bringing efficiencies is swift and their effects are enduring. As we look to the immediate future of healthcare, what changes to the digital environment would bring the greatest positive impact for the next three years down the road? A-third of the C-level decision-makers (33.8%) across the globe believe that improving electronic communications between healthcare professionals is the number one priority, for example mobile tools such as apps to facilitate cross department communication would be very useful. The ability to store and effectively utilize patient records is the next element that would deliver the most impact. Decision-makers from the Americas and Asian countries also rank digital triage as the desirable first approach to identify and prioritize patients high on the list. Still, almost a third of respondents believe that there is an urgency in adopting telemedicine or e-consultation with patients.

Clearly, connecting care teams and patients, as well as effectively leveraging patient records are top of mind for C-level decision makers. (Case studies on how other hospitals have effectively achieved this are provided at the end of this paper.)

What changes would bring the greatest positive impact?



#1:

E-communication between healthcare professionals



#2:

Effective storage and use of patient records



#3:

Tele-medicine and e-consultation

The challenges of digital transformation in healthcare

If decision-makers are convinced of the benefits that digital technologies can bring to healthcare, what is holding health systems back in their efforts to digitalize their enterprises? Our analysis of the data from The Economist Intelligence Unit survey reveals that the lack of investment in digital technologies is the leading challenge globally, with more than half of respondents naming it as the main roadblock. Nearly half (47%) of decision-makers reported a shortage of skills as a key challenge as well. It is no surprise that respondents struggle with finding the right talents to digitalize their enterprise, especially in Asia where this is ranked highest. Recruiting people with expertise both in healthcare and digitalization is not easy. Bureaucracy is another hurdle that hinders the development of digitalization in health systems, with respondents in Europe perceiving it as a greater challenge than others. While technology is at the core of digitalization, people and their talent are the engine driving this vision forward.

What are the main challenges to improving digital environment?



#1:

Lack of investment



#2:

Shortage of skills



#3:

Bureaucracy

Conclusion

Prior to the pandemic, healthcare providers around the world have already been paving the way in their digital journey, and their efforts have helped them manage the COVID-19 challenge. Digital tools such as telehealth and e-communication tools for caregivers have proven to be viable and effective and will continue to be an important part of patient care post-COVID-19. The demand for digital tools in healthcare triggered by COVID-19 should help healthcare providers reprioritize funding needed for improving its digital environment, and new purchasing models that are not highly dependent on capital expenditure should be evaluated. To overcome the challenge of skill shortage, healthcare providers should consider launching programs similar to the ones in Spain, where disruptive talent development initiative called Moebio consists of several training programs is used to promote innovation and entrepreneurship in the digital health field¹⁰. Remote expert support and clinical decision-making tools also play a major role in enabling healthcare providers to offer care in areas where skilled workers are lacking. Finally, to tackle bureaucracy, more recommendations and guidelines similar to the study¹¹ funded by the European Commission on how to improve the procurement of digital solutions in healthcare would be needed. Clearly, providers cannot be in this journey alone. A coordinated effort between providers, industry, and government would be crucial to making headway for digitalizing healthcare. Providers would need stable support from the government for having appropriate reimbursement model, while reducing bureaucracy and regulatory hurdles. At the same time, vendors need to act as partners to healthcare providers and offer new and relevant digital solutions.

The experiences from this pandemic will serve as guideposts for the next steps in healthcare digital transformation. By taking stock of the current progress collectively, healthcare organizations can not only better strategize the next course of action, but also greatly benefit from shared experiences to help each other navigate the complex digital landscape. You can benchmark the progress of your organization against the assessment of C-level decision-makers in your country using the overview of digital topics and technologies (please see graphic on page 9 and appendix B). Once you identify a topic of interest, please visit the following case studies for concrete examples as you chart the course of your digital expedition.

Case study 1

Manage data as a strategic asset: Scaling up and sustaining the digital transformation of US hospitals brought about by COVID-19. Hospitals that are a step ahead in digital transformation, including a cloud-first data strategy, have not only reaped the benefit of better managing the immediate crisis, but also being better positioned for long-term success.

Healthcare providers interviewed in this case study

- Christopher Longhurst, physician and Chief Information Officer at the University of California, San Diego, USA
- Dr. Jeffrey Ferranti, Chief Information Officer at Duke Health, USA
- Aaron Miri, its Chief Information Officer, University of Texas, UT Health Austin, USA

[Link to case study](#)

Case study 2

Empower data-driven decisions: Using imaging and AI to help diagnose and manage COVID-19 patients. AI-supported imaging tools can help hospitals diagnose COVID-19 patients quicker and more efficiently, unleashing its potential for wider adoption in managing patients with other conditions.

Healthcare providers interviewed in this case study

- Professor Alexander Wong, Canada Research Chair in AI and Medical Imaging, University of Waterloo, Waterloo, Ontario
- Dr. Erik Ranschaert, radiologist and AI project leader at Elisabeth-TweeSteden Ziekenhuis (ETZ) Hospital, Tilburg, the Netherlands
- Dr. Julien Guiot, head of clinics, at the department of respiratory medicine, CHU of Liège, Liège, Belgium

[Link to case study](#)

Case study 3

Connect care teams and patients: Virtual hospital ward rounds involve wider number of clinical experts and families. Virtual rounding has become an attractive solution during the COVID-19 pandemic. Its various applications could become a key part of the health system if its challenges are accepted and well managed.

Healthcare providers interviewed in this case study

- Dr. Lee Schwamm, C. Miller Fisher Chair of Vascular Neurology and director of the Center for Tele-Health at Mass General Hospital in Boston, USA
- Dr. Judd Hollander, emergency room physician and associate dean for strategic health initiatives at Thomas Jefferson University Hospital in Philadelphia, USA

[Link to case study](#)

Case study 4

Build a learning health system: Outside the hospital – cancer monitoring with apps. Mobile tools such as patient monitoring app is a key component to providing more personalized care to patients. Its application in oncology care unveils the pathway to success: a concerted effort from regulators, providers, developers, and patients.

Healthcare provider interviewed in this case study

- Dr. Trevor Royce, assistant professor and oncologist at the Lineberger comprehensive cancer centre at University of North Carolina – Chapel Hill

[Link to case study](#)

Appendix A

	Average self-assessment rating across all categories (in absolute numbers)	Self-assessment position
China	8.75	1
USA	8.19	2
Japan	8.08	3
Australia	8.05	4
Brazil	7.97	5
United Kingdom	7.87	6
Italy	7.77	7
Spain	7.73	8
Germany	7.23	9
France	7.22	10

Appendix B

Category		Deviation to average country/regional self-assessment										Amer- icas (rel.)	Europe (rel.)	Asia- Pacific (rel.)
		Australia	Brazil	China	France	Germany	Italy	Japan	Spain	UK	USA			
Managing data as strategic asset	The integration of data from clinical platforms into a single electronic health record ¹	-10%	2%	-1%	0%	-2%	-1%	-3%	2%	-1%	1%	2%	-1%	-4%
	The integration of data from non-clinical platforms into a single electronic health record ¹	-1%	-7%	-3%	-4%	-16%	-2	1%	-6%	0%	-7%	-7%	-5%	-1%
	Ease of patients access to their personal health data ²	-3%	2%	1%	1%	2%	-2%	2%	0%	-1%	6%	4%	0%	0%
	Cybersecurity measures to protect patient data from unauthorized access ²	5%	-2%	0%	4%	13%	6%	4%	1%	2%	-4%	-3%	5%	3%
Empowering data- driven decisions	Use of digital analytical tools to monitor the performance of hospital departments ²	-2%	2%	2%	-2%	0%	1%	3%	2%	-1%	1%	1%	0%	1%
	Operational decision support tools to inform leadership decisions ¹	3%	-6%	0%	-4%	-4%	-3%	1%	-2%	-1%	-3%	-4%	-3%	1%
	Use of clinical decision support tools to optimize patient outcomes ²	4%	2%	-2%	1%	-2%	0%	-1%	2%	3%	2%	2%	1%	0%
Connecting care teams and patients	Support to caregivers via remote digital tools (e.g. e-learning or physician tele-consultation) ²	3%	6%	2%	-1%	-5%	1%	-2%	0%	1%	-3%	1%	-1%	1%
	Care teams efficient use of digital tools to communicate with each other ²	-2%	3%	0%	2%	7%	4%	-3%	-2%	0%	3%	3%	3%	-1%
	Virtual care to patients in their homes ¹	-1%	-1%	1%	-9%	-17%	-3%	1%	1%	-2%	0%	0%	-6%	0%
	E-scheduling of appointments ¹	6%	3%	-1%	9%	15%	4%	0%	11%	1%	-1%	1%	8%	1%
Building a learning health system	Use of digital tools to free up time of caregivers ²	-1%	2%	1%	6%	0%	-2%	-2%	-2%	-1%	3%	2%	0%	0%
	Organisational governance structures to support digital transformation ²	3%	-2%	0%	0%	8%	-2%	1%	-1%	1%	3%	1%	1%	1%
	Shared patient outcomes dashboards ¹	-4%	-5%	0%	-4%	0%	-2%	0%	-5%	-3%	-2%	-3%	-3%	-1%

Footnote 1: Question asked in The Economist Intelligence Unit survey: "To what extent are the following implemented in your hospital - xxx"

Footnote 2: Question asked in The Economist Intelligence Unit survey: "How do you believe your hospital rates under the following measures - xxx"

About the authors



Dr. Ralph Wiegner
Global Head of Digitalizing Healthcare
at Siemens Healthineers

Ralph Wiegner and his team engage in thought leadership and portfolio-related activities for Digitalizing healthcare. Earlier, he worked as head of Improving patient experience, head of Marketing Strategy and in global key account management. Prior to joining Siemens Healthineers, Ralph worked for several years in the Banking and Asset Management practice of McKinsey & Company on various European and international assignments. Ralph holds a Ph.D. in Theoretical Physics from University of Erlangen, Germany, with several research engagements at the Oklahoma State University, USA.



Joanne Grau
Thought Leadership Manager Digitalizing
Healthcare at Siemens Healthineers

Joanne Grau focuses on current trends and thought leadership content for Digitalizing healthcare. Prior to this role, Joanne has had ten years of marketing experience in Siemens Healthineers as marketing director for the diagnostics division based in New York and as Head of Marketing for ASEAN countries based in Singapore. Joanne graduated from UCLA with a degree in Molecular, Cell, and Developmental biology. Before joining Siemens Healthineers, Joanne was a research scientist in Quest Diagnostics (formerly Celera) and has authored multiple publications. Joanne is also currently a faculty member in Union University of California.

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Suggested follow-up on

siemens-healthineers.com/insights/digitalizing-healthcare

- Siemens Healthineers Insights paper issue 12: This changes everything – The COVID-19 pandemic leads to a significant acceleration of digitalization in healthcare. Available at: siemens-healthineers.com/insights/news/accelerate-digital-health-transformation.html
- Siemens Healthineers Paper Embracing Healthcare 4.0. Available at: siemens-healthineers.com/insights/news/embracing-healthcare-4-0.html



Information

The Siemens Healthineers Insights Series is our preeminent thought leadership platform, drawing on the knowledge and experience of some of the world's most respected healthcare leaders and innovators. It explores emerging issues and provides practical solutions to today's most pressing healthcare challenges.

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Contact

For further information on this topic, or to contact the authors directly:

Dr. Ralph Wiegner
Global Head of Digitalizing healthcare

ralph.wiegner@siemens-healthineers.com

At Siemens Healthineers, our purpose is to enable healthcare providers to increase value by empowering them on their journey towards expanding precision medicine, transforming care delivery, and improving patient experience, all enabled by digitalizing healthcare. An estimated five million patients worldwide benefit every day from our innovative technologies and services in the areas of diagnostic and therapeutic imaging, laboratory diagnostics and molecular medicine as well as digital health and enterprise services.

We are a leading medical technology company with over 120 years of experience and 18,500 patents globally. With about 50,000 dedicated colleagues in over 70 countries, we will continue to innovate and shape the future of healthcare.

Siemens Healthineers Headquarters

Siemens Healthcare GmbH
Henkestr. 127
91052 Erlangen, Germany
Phone: +49 9131 84-0
[siemens-healthineers.com](https://www.siemens-healthineers.com)