



## Digital platforms in healthcare

Best Practices from Austria, Germany, Liechtenstein, and Switzerland

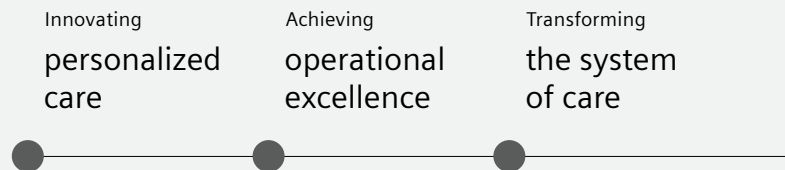
A thought leadership paper on "Achieving operational excellence"

# Preface

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# Foreword

Against the backdrop of a shortage of care staff and reduced investment in the German healthcare system, it is once again time to turn our minds away from the challenges and consider potential solutions. These include complete and seamless documentation of patient treatment, comprehensive traceability of pre- and post-clinical processes for attending physicians and care staff, and the active involvement of patients in the treatment process.

Platform concepts are a key part of delivering these solutions, for they allow the smooth and structured exchange of data across different IT systems, applications, and sectoral boundaries. This is beneficial for everyone involved in treatment—not only for the patients, who are the focal point of treatment, but also for physicians, care staff, physiotherapists, pharmacists, and so on. At the same time, platform concepts have the potential to reduce costs, in the sense that solutions bring about efficiencies and are supplied as either “software as a service” or cloud services. In addition, as volumes of data continue to grow over the coming years, this data will finally be utilized. Platforms have the potential to break down the “data silos” that still exist today by allowing data to be transferred securely between different systems. Moreover, open platform concepts that rely on standardization and interoperability allow straightforward and secure interfacing with tools outside of the institution, such as certified apps from

the countless new providers of digital health apps and other digital services—from fitness trackers to apps from health insurance companies and medication plans from pharmacists. By doing so, platforms are paving the way for improved care delivery across sectoral boundaries.

This thought leadership paper uses examples from the neighboring countries Austria, Liechtenstein, and Switzerland to show that best practices already exist for healthcare platforms on a national basis. These platforms incorporate all service providers involved in treating patients.

In the case of Germany, this paper looks at the example of University Medical Centre Mannheim (UMM), which uses a platform for institution-wide clinical solutions.



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# Introduction

Many of us now routinely consume content or perform tasks digitally in our everyday lives. Globally, people spend almost seven hours per day on the Internet.<sup>1</sup>

Digital living makes our daily lives easier in many respects: Our alarm clock goes off at the ideal time thanks to wearables that determine exactly when we should wake up by tracking our sleep phases. Our blinds open automatically thanks to networking via smart home applications. Our bathroom scales measure not only our weight but also our bone density and percentage of muscle and body fat. By recording this and other data, they can compare it with that of previous weeks on request. Based on this comparison, we may need to adapt the training program in our fitness app. At breakfast, the smart fridge reminds us that the milk is running out—and can relay this information to our electronic shopping list or go ahead and order the milk automatically. And it's now been some time since we stopped reading the morning newspaper in paper form, opting instead to read it on a tablet or smartphone. Nowadays, many of our morning routines look something like this. The scenarios outlined here illustrate the sheer quantity of digitalization we experience before we've even been awake for half an hour!

As the day progresses, we make use of many other digital tools. We attend our first meeting of the day in virtual form from our cars, and later in the day we pay invoices by making wire transfers from our online banking. In our lunch break, we buy shares or order more shampoo. After work, AI algorithms provide us with tailored suggestions for our next vacation destination—and we can book our chosen package effortlessly online.

Our day ends in front of a smart TV that recommends our favorite series at the touch of a button.

Medical assistance is another area in which we can increasingly turn to digital services for help. Although the bulk of interactions between healthcare providers and patients still take place in an analog setting, there has been considerable progress in this area in recent years—not least as a result of the global COVID-19 pandemic. Appointments can now be booked online, and some consultations are even held virtually via telemedicine apps. Medicines can be ordered from online pharmacies, and the data generated in the process is stored in electronic patient records in countries such as Austria, Liechtenstein, and Switzerland.

What all of these scenarios have in common is that they involve the use of multiple apps, software solutions, or websites that are often based on a corresponding platform solution. The implication is that large volumes of data are generated and collected on many different platforms, but there is often no connection between the platforms and data. In some areas, this lack of interconnection is a positive feature in terms of data protection. After all, an online supermarket shouldn't know how much I weigh based on data that my digital scale automatically stores in an app—nor should it know what movie I watched last night. In medicine, on the other hand, this kind of interconnection might be a sensible idea. Would it not be useful if my family physician could instantly see how my weight has changed, what medicines I've ordered or taken, and what diagnosis the specialist has reached?

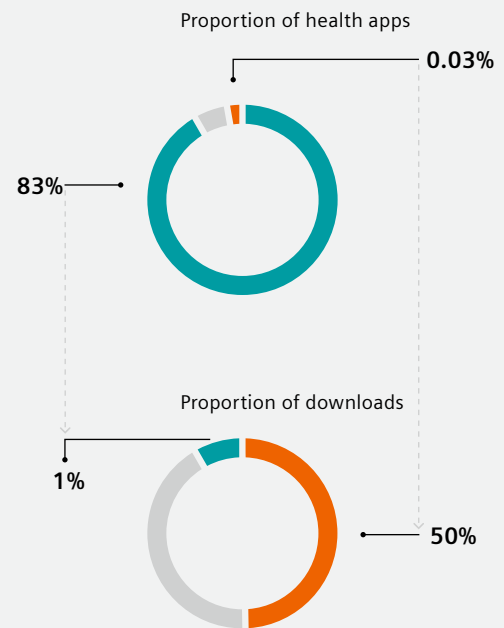
# The challenge

In the healthcare sector, there is a clear trend toward platform concepts in both the B2B and B2C markets. For example, a growing number of platforms act as portal solutions, providing physicians with access to patient data. These are joined by communication platforms for service providers, as well as platforms that are used to provide training or continuing education to staff. Likewise, there are a growing number of platforms in the B2C market, including solutions for virtual consultations or preventive measures, and platform technology provides a basis for interfacing with online pharmacies and health insurance companies. A variety of platforms now also allow users to download numerous apps for specific clinical pictures or indications.

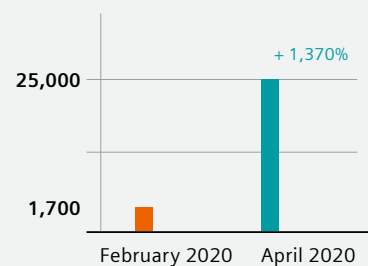
## A growing range of digital solutions

A study has shown that, in 2021, app stores provided patients and service providers with access to over 350,000 health apps.<sup>2</sup> A large proportion of these apps—almost 50%—provide services for specific clinical pictures, chronic diseases, or mental health. Analyses of user behavior show that not all of these apps are used successfully or on a lasting basis.<sup>2</sup> Specifically, 83% of health apps have been installed fewer than 5,000 times and therefore account for less than 1% of all downloads in this sector.<sup>2</sup> By contrast, the top 110 health apps account for 50% of all downloads and have been downloaded more than 10 million times.<sup>2</sup>

Only a very small proportion of the over 350,000 health apps have been downloaded frequently (2021).<sup>2</sup>



Number of German medical practices offering video consultations.<sup>3</sup>



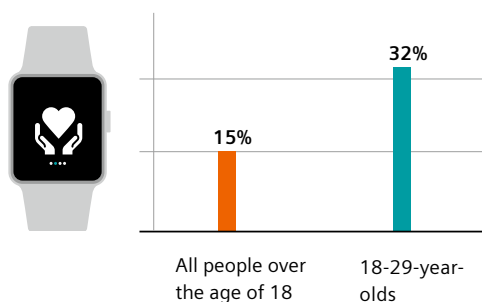
Particularly since the COVID-19 pandemic, there has also been a significant increase in investments in digitalization on the part of service providers. According to estimates by the National Association of Statutory Health Insurance Physicians (KBV) in Germany, some 25,000 German medical practices—around a quarter of the total number—offered video consultations in April 2020. Compared with late February of the same year, this represents a massive increase of around 1,370%.<sup>3</sup>

### Increased demand driven by patient interest

This trend is driven by many factors, including, above all, significant advances in technical capabilities—particularly in the last decade. Increased demand from patients, or rather consumers, can be seen as another key factor. In a survey carried out in 2018, before the COVID-19 pandemic, 32% of 18-29-year-olds reported using wearables.

## Patients want more digitalization

Proportion of people who wear wearables in Germany (2018)<sup>4</sup>



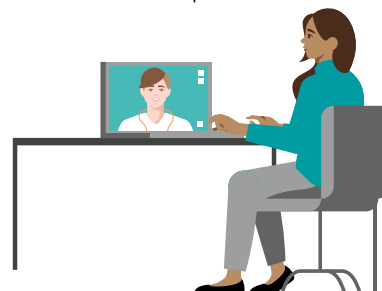
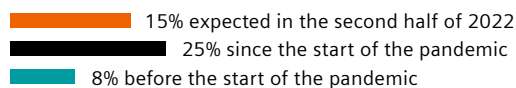
In total, over half of Germans could imagine themselves using a wearable or were currently wearing such a device.<sup>4</sup>

There is also greater interest in virtual consultations. Whereas the proportion of virtual appointments for patients was around 8% before the COVID-19 pandemic, this figure rose to 25% in June 2020.<sup>5</sup>

### Healthcare—an attractive target market

Changing demand has led to the emergence of many new market players. In addition to the founding of multiple startups in this sector, there have been particular attempts by major global tech companies—including Alphabet, Amazon, Ping An, or Tencent—to gain a foothold in the healthcare market by means of platform solutions. Indeed, given recent improvements in the legal framework, the time seems to be ripe for such endeavors.

Proportion of virtual consultations in Germany<sup>5</sup>



These improvements take the form of various legislative initiatives such as Germany's Hospital Structure Act (KHSG). Likewise, there is growing acceptance and readiness on the part of insurers to contribute to the costs of such platforms in the B2C market.

### Data silos—a challenge for efficient service provision

The increasing number of digital platforms allows two challenges to be addressed at once. On the one hand, there is a growing “flood of data” in the healthcare sector, and it is predicted that the volume of healthcare data will grow by an average annual rate of 36% from 2018 to 2025.<sup>6</sup>

This means that no other industry is growing as rapidly as healthcare (manufacturing: 30%; financial services: 26%; media and entertainment: 25%).<sup>6</sup>

Although this is not a major challenge in itself, the number of possible locations at which data is stored is also increasing, making it very difficult or even impossible to exchange data between these locations. This leads to a situation whereby only one in three hospitals in the U.S. is able to exchange patient data with other service providers electronically.<sup>7</sup> This, in turn, exacerbates a problem that has existed in healthcare for decades—namely, the formation of data silos.

Data silos are the cause of insufficient data integration and are estimated to result in annual losses of US\$342 billion in the U.S. alone.<sup>8</sup> The resulting problems include not only additional costs, but also other issues—including everything from inefficiencies in service provision to unnecessary errors in both diagnosis and treatment. These issues are compounded by a series of missed opportunities that could have paved the way for better patient outcomes.

### Average annual growth rate of data (2018–2025)<sup>6</sup>



Both the volume of data and the number of locations where it is stored are growing

### Key technologies for healthcare providers in % of respondents<sup>9</sup>

78%

Electronic patient records (EHR)

57%

Digital patient portal

52%

Patient medical devices that integrate with the EHR

44%

Mobile apps that help patients manage their health

*The percentages above indicate the proportion of surveyed healthcare providers that answered 6 or 7 on a scale from 1 ("not important at all") to 7 ("very important") when asked: "In your opinion, how important are each of the following technologies for you today?" Source: PwC. Medical cost trend: Behind the numbers 2022. 2021.; PwC Health Research Institute clinician survey, March–April 2021.*

## The solution

### Health platforms in Switzerland, Austria, Liechtenstein, and Germany

Until now, the digitalization of healthcare has focused on optimizing individual, largely stand-alone primary and expert systems that operate and collect data independently of one another. The potential for optimization, however, lies in using digital platforms to link up the individual participants and their systems.

According to a study in the U.S., service providers believe that the key lies in adopting a standard for patient records. This is hardly surprising given that patients—and therefore their data—are at the focal point of healthcare provision. In the study, 78% of respondents felt that this technology was very important.<sup>9</sup> Second in the list of identified needs, at 57%, was the digital patient portal—in other words, a portal for admission, treatment, and discharge management.<sup>9</sup>

Instead of focusing purely on electronic patient records, most countries go one step further and use this technology as a basis for implementing comprehensive health platforms that bring together a series of digital solutions.





### Best practices from the Switzerland, Austria, Liechtenstein, and Germany

1

Switzerland

2

Austria

3

Liechtenstein

4

Germany

## National platforms

The seemingly unstoppable rise of digital health platforms represents a game-changer when it comes to the transformation of healthcare. Switzerland, Austria, and Liechtenstein are leading by example in this regard.

### Switzerland

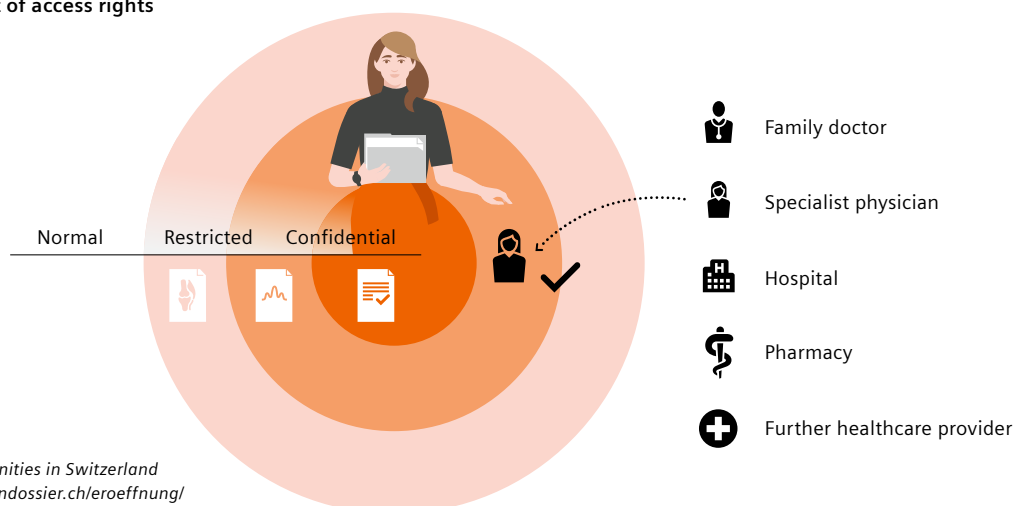
In Switzerland, system providers including Swiss Post facilitate the provision of electronic patient records for “core communities” (organizational associations of health professionals and their institutions).<sup>a</sup> The Post E-Health platform enables not only healthcare providers but also citizens to store important documents (such as advance healthcare directives or self-measured data) and to provide additional information that is relevant to treatment.

Patients can control access to the data themselves, and it is therefore up to them which healthcare providers can view which data. In the case of medical emergencies that require immediate access to data, however, health

information can be accessed regardless of the data protection settings. Any such use is automatically recorded so that patients can be notified afterwards. This improves the safety and quality of treatment because the attending professionals always have the relevant data to hand.

Swiss Post has also launched “Cuore—the Swiss health platform,” a secure digital platform aimed at all health-care stakeholders looking for an easy-to-operate solution for improved care delivery. These stakeholders include hospitals, rehabilitation associations, medical practices, nursing homes, associations for assistance and care at home, health insurers, technology partners, and patients. Interfacing with networking platforms provides new approaches to integrated care across the entire treatment pathway. This begins with a central record of healthcare providers and includes everything from the first appointment in the form of a virtual consultation to electronic referral to specialists and continuous monitoring of patients via sensors (remote monitoring).

### Individual management of access rights



<sup>a</sup>An overview of core communities in Switzerland can be found here: [patientendossier.ch/eroeffnung/wer-sind-die-epd-anbieter](https://patientendossier.ch/eroeffnung/wer-sind-die-epd-anbieter)

**97%**

*of the insured population of Austria  
is registered with the ELGA system<sup>10</sup>*

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## Austria

Austria is one of Europe's pioneers when it comes to the use and widespread adoption of a nationwide health platform. A system of electronic health records known as ELGA provides secure and easy access to the necessary data for users including citizens, patients, physicians, care staff, and pharmacists. Access to the data is, however, limited to the citizens themselves and the healthcare providers that are currently providing their treatment or care.

Whereas Switzerland requires its citizens to actively register for the platform, Austria operates an opt-out model. In other words, all citizens participate in ELGA automatically and must actively deregister if they prefer not to take part. As a result, around 97% of the insured population of Austria is registered with the system.<sup>10</sup>

Austria also operates its own model with regard to data protection. Physicians can view patient data for 90 days from the start of treatment, and hospitals have access to the data for an additional 90 days after the patient is discharged. ELGA also allows the integration of additional eHealth solutions. During the COVID-19 pandemic, for example, many countries discussed the introduction of an electronic vaccination certificate. Thanks to ELGA, Austria already had a technical foundation in place for the electronic management of vaccination records. By August 2022, more than 19 million vaccinations had been recorded in Austria's electronic vaccination certificate system.

## Liechtenstein

Liechtenstein is in the process of implementing a platform known as the Electronic Health Dossier (German abbreviation: EGD), which contains administrative and health data relating to insured individuals. Its use will be compulsory for healthcare stakeholders such as hospitals, medical practices, and pharmacies from July 1, 2023.

The insured individual can object to the use of the EGD, in which case the dossier will not be used to store any medical information. In the absence of such an objection, the corresponding legislation clearly sets out which health and genetic data are considered to be relevant to treatment and must therefore be stored in the EGD or processed by stakeholders.

When it comes to treatment, access rights are granted to EGD healthcare providers that are, in principle, entitled to them. In addition, the insured person has the opportunity to hide or delete specific information altogether or to mark it as confidential so that it can only be viewed by their specified stakeholders. Data sovereignty therefore always remains with the insured person, although any stakeholder can access the EGD in an emergency even if the patient has not granted them access rights in advance. All access is logged, and the patient is then notified proactively in the event of emergency access without prior permission.

## Advantages

Depending on how the national health platform is designed, there are different advantages for patients, health insurance companies, and healthcare providers.

Patients benefit in several respects. Thanks to the individual assignment of rights, they enjoy full sovereignty over their data and independent access to their medical information. Use of the platform is facilitated by the incorporation of additional features such as electronic vaccine certificates, individual medication plans, or virtual consultations.

A nationwide health platform also offers numerous advantages for health insurance companies. For example, it greatly facilitates the provision of medical data in digital health and patient records. In supply agreements between health insurance companies and service providers, digital support also makes it easier to incorporate value-added services.

In addition, digital communication between service providers leads to cost savings as well as improved quality, and the open platform concept promotes direct collaboration with other healthcare stakeholders. The harmonization of data and standards also leads to a reduction in administrative costs.

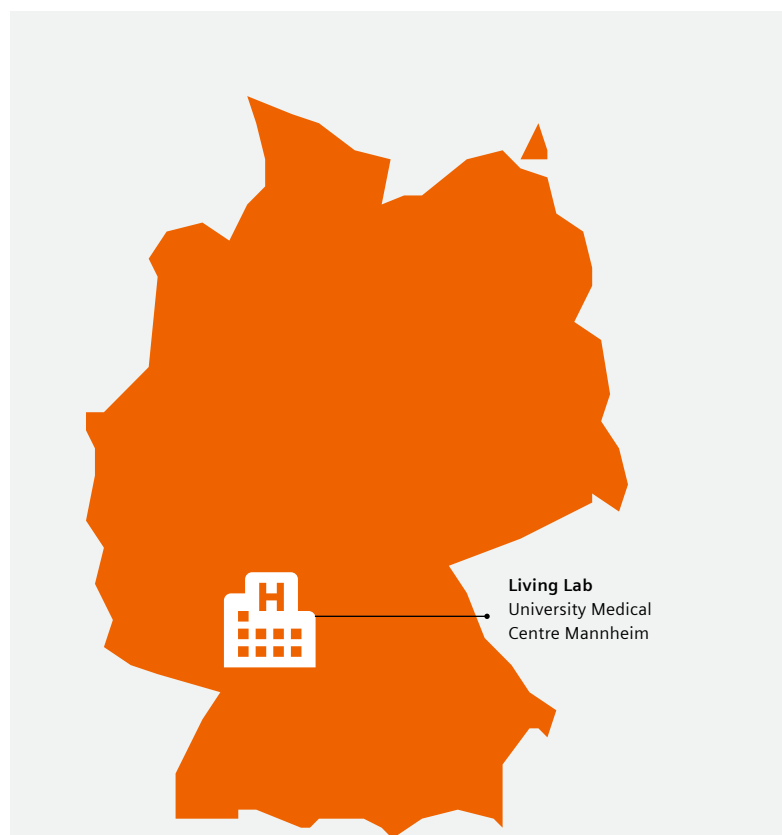
The advantages for healthcare providers include greater compliance by patients due to their closer involvement in care processes and prevention, as well as considerable competitive advantages thanks to the provision of individual digital services for their patients and simplified interfacing with health and patient records. There is also a reduction costs as a result of standardization and interoperability across departmental and institutional boundaries. This can lead to a significant boost in efficiency, as well as optimized processes and a welcome increase in interaction and personal responsibility on the part of patients.

## Institution-wide platforms

The key to a successful platform strategy in healthcare is to maintain a consistent focus on users, or rather patients, by adopting electronic patient records that can be used to integrate other eHealth solutions—for example, in the form of apps. Moreover, the examples from Austria, Liechtenstein, and Switzerland show extensive networking of healthcare stakeholders at the population, cross-institutional, and national levels. In Germany, the university hospital in Mannheim has embarked on a path that enables platform-based, institutional-level networking of digital solutions for everyday clinical practice.

### Germany

At University Medical Centre Mannheim (UMM), the Living Lab is using a test platform to bridge the gap between the university hospital and providers of digital solutions. The Living Lab is an interdisciplinary ward for the treatment of urology and orthopedic patients and offers a real-world clinical testing environment as well as technical facilities for the testing and development of digital solutions during everyday life on the ward. Here, startups and SMEs can put their solutions to the test in a routine clinical setting.

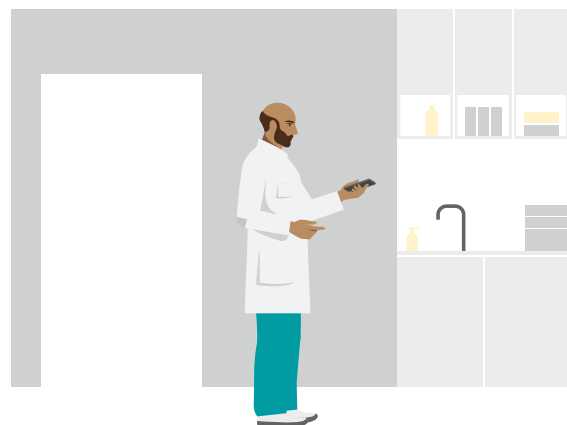
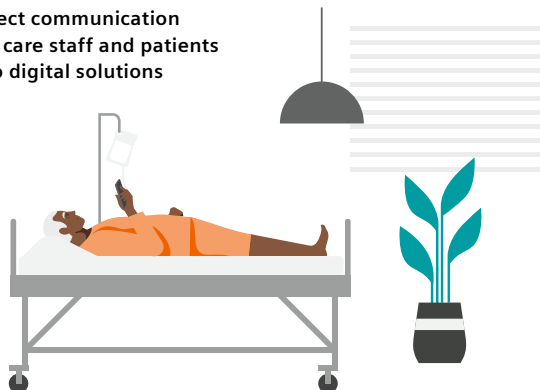


## Advantages

For example, an app is used to digitalize communication between care staff and patients as well as communication between hospital personnel. Using the app, patients can select their request from a preconfigured menu and send it to staff, who are automatically assigned to requests based on their skills profile and role. Messages are displayed on care staff's smartphones and include patient requests such as "The drip is finished," "I need a bottle of water," or "I'm missing a fork." The care staff receive details of the specific request while they're still on the move, saving them the need to make multiple trips. During testing of these innovative solutions, providers can collect feedback from physicians, care staff, and patients, as well as generating data for clinical studies and regulatory approvals. The Living Lab is currently operating in two departments of UMM. Of course, a platform of this kind can be used not only across an entire institution, but also across multiple institutions.

Thanks to integration into a digital health platform, even within the setting of a single facility, patients benefit from medical treatment and care based on innovative solutions. For example, the potential advantages include more efficient care thanks to shorter patient journeys, more direct communication, and shorter hospital stays. Likewise, for service providers, platforms offer access to future-proof solutions by allowing straightforward integration of digital solutions into routine clinical practice—for example, within the framework of an innovative testing environment that meets data-protection and other regulatory requirements, such as that at UMM. Here, uniform standards and reliable interoperability promote efficient collaboration between stakeholders and across care delivery boundaries.

**More-direct communication  
between care staff and patients  
thanks to digital solutions**



# Recommendations

The examples described here demonstrate that platforms can be a driver of efficiency in healthcare systems. This greater efficiency comes in addition to the added value derived from the smart exchange of data and the interconnection of various stakeholders, which pave the way for better integration of healthcare services. In turn, this improved integration boosts the quality of patient care and increases satisfaction among chronically overburdened physicians and care staff.

Nevertheless, if we are to push ahead with greater platform-based networking of healthcare, it will be necessary to involve the full range of healthcare stakeholders.

## **Establishment of a regulatory framework**

As we have seen, the degree of progress varies from one country to the next when it comes to digitalization—including with respect to the regulatory framework. In principle, the first step is therefore to establish a framework for achieving initial standards for the digitalization of healthcare. This includes the adoption of nationwide electronic patient records such as those

seen in the examples of Austria, Liechtenstein, and Switzerland. It also includes the digitalization of key documents, such as vaccination certificates, maternity records, and dental bonus booklets (particularly in Germany), as well as the acceptance of digital solutions such as health apps on prescription and the expansion and promotion of telemedicine—Germany has recently caught up in this regard, not least thanks to the billions of euros in support provided by the Hospital Structure Act (KHSKG). Moreover, it is vital to facilitate the electronic processing of health data so that these data can be analyzed and operationalized using business intelligence solutions. For example, this allows the creation of predictive models that identify cohorts and high-risk patients as well as the derivation of corresponding measures.

## **Modern infrastructure is essential**

Stakeholders should be aware that digitalization is about more than simply installing new software. Nevertheless, healthcare providers are often reluctant to make the necessary investments in converting or setting up modern IT infrastructure.

This view is too short-sighted, however. If providers continue to use outdated software in core clinical processes—even though it offers neither the necessary scope of use nor sufficient user-friendliness or interoperability—then they are likely to fall behind in the competition for efficiency, staff, and patients. Platform concepts allow providers to achieve greater independence from existing systems by making manageable investments while also building up modern software infrastructure.

### **Patient involvement**

The successful use of platforms in healthcare depends largely on patient acceptance. Those who suffer from chronic diseases and/or mobility problems, platforms can have a positive impact—whether it is because they allow physicians to access health data via real-time monitoring or because they pave the way for remote consultations that avoid unplanned repeat admissions, resulting in an overall improvement in quality of life. As some people are often hesitant about engaging

with new technologies, however, it may be necessary to place a greater emphasis on patient involvement and education. Of course the issue of data protection and trust is also a key factor in this context. Health data is probably one of the most sensitive forms of data, and its secure storage and handling must not only be guaranteed, but also clearly communicated to patients. This communication can be assisted by a modern and easy-to-understand system of consent management.

### **Easy access to all services**

For both service providers and patients, it is possible to boost acceptance of platform solutions by making improvements to user-friendliness. In addition to a straightforward user interface, the key element here is the “single sign-on” approach. Instead of working with multiple different platforms that each have their own logins, this approach is the most convenient option both for patients and for medical staff. It is essentially the same concept as “one-stop shopping,” whereby a single platform provides access to various digital services.



## Solutions must be interoperable

Standardization and interoperability are essential when it comes to the application of digital platforms in healthcare, so that users can switch between platforms and services while the independence of the individual platforms is maintained. A cross-sectoral and cross-institutional approach allows the secure exchange of data between individual providers for the benefit of their patients and promotes efficient and secure collaboration.



## Suggested follow-up on

[siemens-healthineers.com/insights/transforming-care-delivery](https://siemens-healthineers.com/insights/transforming-care-delivery)

- Insights Series, issue 25: An ounce of prevention is worth a pound of cure: Population health management in Germany's Black Forest. Available at: [siemens-healthineers.com/insights/news/managing-population-health](https://siemens-healthineers.com/insights/news/managing-population-health)
- Insights Series, issue 19: Unlocking the Digital Front Door: How healthcare can be made more accessible. Available at: [siemens-healthineers.com/insights/news/unlocking-the-digital-front-door](https://siemens-healthineers.com/insights/news/unlocking-the-digital-front-door)
- Insights Series, issue 15: Achieving healthcare happiness – The Finland model. Available at: [siemens-healthineers.com/insights/news/the-finland-model](https://siemens-healthineers.com/insights/news/the-finland-model)



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At Siemens Healthineers, we pioneer breakthroughs in healthcare. For everyone. Everywhere. By constantly bringing breakthrough innovations to market, we enable healthcare professionals to deliver high-quality care, leading to the best possible outcomes for patients. Our portfolio, spanning from in-vitro and in-vivo diagnostics to image-guided therapy and innovative cancer care, is crucial for clinical decision-making and treatment pathways.

Built on a history of innovation going back more than 125 years and with unique strengths in patient twinning, precision therapy, as well as digital, data, and artificial intelligence (AI), we are well positioned to take on the biggest challenges in healthcare. We will continue to build on these strengths to help fight the world's most threatening diseases, improving the quality of outcomes, and enabling access to care.

As a leader in the industry, we aspire to create better outcomes and experiences for patients no matter where they live or what health issues they are facing. We innovate sustainably to develop scalable solutions that can be tailored to the needs of healthcare providers, and the local health infrastructures.

Motivated by our purpose and guided by our values, we are building an inclusive culture, where we embrace diversity in all its forms. We are a team of 66,000 highly dedicated employees across more than 70 countries passionately pushing the boundaries of what's possible in healthcare to help improve lives of people around the world.



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