

The digital opportunity in the Swiss healthcare system

A patient-centric analysis of technology trends
in Swiss healthcare

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strategy&



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Management summary

This study reveals that certain new technologies (including big data and data management, and improved and more accurate wearables and sensors) will be highly effective in terms of addressing the pain points currently reported by patients themselves. These technologies should be commercially available very soon. We expect big data and data management to transform the diagnosis process from a subjective experience to an objective, data-driven process, resolving patient concerns about transparency, treatment rationale and treatment effectiveness.

We also believe that improved wearables and sensors will enable effective self-diagnosis, monitoring and remote treatment. These would be significant steps towards a prevention-based healthcare industry able to identify and remedy medical conditions at a very early stage.



About this study

This study examines Swiss patients' needs in conjunction with major technological trends in the healthcare industry. Conducted in cooperation by PwC, Strategy& and the University of St. Gallen (CEMS Master's in International Management programme), it strives to understand the Swiss healthcare sector from the patient's point of view. Based on a total of 38 interviews with a diverse set of patients and industry experts, we synthesised patient personas and developed comprehensive customer journeys. The input served as a basis for identifying pain points for each of our predetermined persona groups. By linking these to existing and upcoming digital trends, we get an indication of which trends can best tackle the industry's challenges from a patient's perspective.

23
Persona
interviews

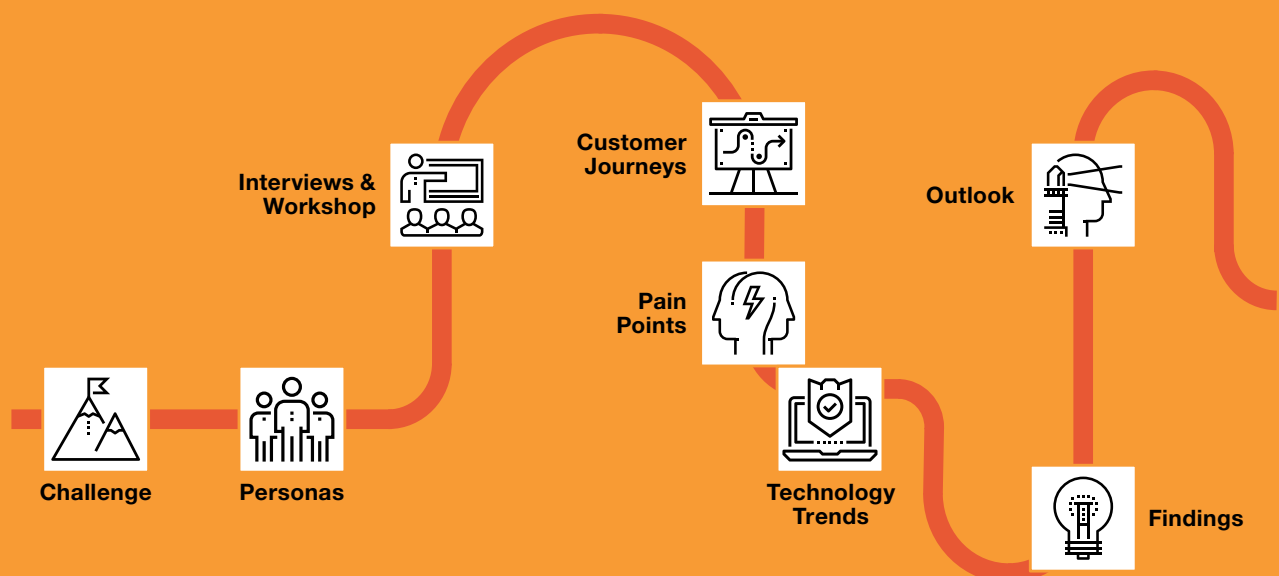
15
Expert
interviews

1
Workshop
with leading
health experts

Graph 1: Overview of interviews and workshop



Graph 2: Study approach



Introduction

This study looks into Swiss patients' needs in conjunction with major technological trends in the healthcare industry

In the last couple of years, any discussion about the healthcare industry has inevitably touched on digitisation and new technologies. These trends offer many opportunities to improve healthcare, both in terms of the way patients are treated and the way treatments are organised and enabled. They're also seen as a means of tackling major challenges in the healthcare system. The problem is that simply applying these new technologies without properly understanding the needs of patients will cause new problems rather than solving existing ones.

In our study we analyse these technological trends from the patient's point of view. We identify the customer journeys of major patient groups and important pain points along these journeys, and on this basis work out which technological trends can best address these pain points.

This customer-centric approach has enabled a solid analysis of patient needs and pain points while at the same time allowing us to identify profound implications in terms of the relevance of these technologies for the healthcare industry. The dual thrust of our findings will help key players prioritise and optimise the way they adapt new technologies to succeed in a competitive environment in the future, and ultimately unleash the full potential of digitisation in healthcare.



Graph 3: Patient-centric approach of the study

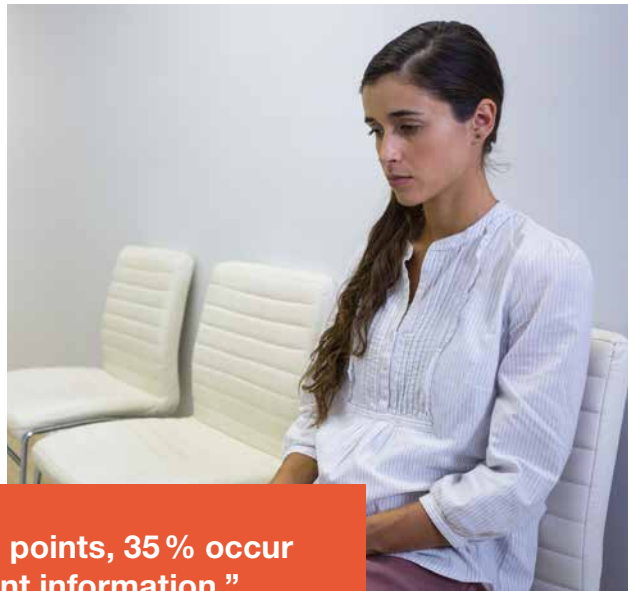


Key findings across patient journeys and the resulting pain points

Six key types of patient were identified and differentiated in terms of distinctive characteristics

To best reflect the Swiss patient landscape, we identified six personas to cover the most important demographic clusters, lifestyles, attitudes, and mental and social statuses (see Graph 4 and 5).

We analysed each persona's customer journey to identify and understand the main pain points experienced by the various groups. The diagram on page 7 shows the underlying customer journey framework (see Graph 6.)









“Of all the listed pain points, 35 % occur because of insufficient information.”





Graph 4: Description of patient personas

Health Enthusiast	Health enthusiasts are regularly physically active and value wellness and coaching services. Their personal health is one of their highest priorities. They have rather low hospitalisation rates, though they're quite open to consulting physicians and specialists.	
Sceptic	Sceptics generally avoid interacting with the health system. They have nearly the same hospitalisation frequency (emergencies and hospital visits) as health enthusiasts, but see physicians and specialists less often.	
Healthy Family	Healthy families are households with healthy dependent children under the age of 18. They interact with the health system at about the same frequency as the Health Enthusiasts – mainly for vaccinations and regular check-ups for their children.	
Chronic	Customers with chronic, complex disease and mental illness live with one or more chronic conditions affecting one or multiple body parts. They require uncomplicated (one body part) or complicated (more body parts) disease management.	
Frail Elderly	Frail elderly people are over the age of 75, live at home or in old people's homes, and face health issues related to falls or dementia and suffer generally poor health. They are the heaviest users of care services and prescription drugs.	
Mentally Stressed	Mentally stressed people can be found at all age levels within our society. The awareness of mental health has grown in recent years. However, many who suffer are still left alone with their problems, or don't have the courage to seek help.	

Graph 5: Categories to define patient personas

Demographics	Age and gender together lead to specific health needs at different levels of the variables.	
Lifestyle	Exercise, diet and substance consumption have a clear impact on health needs.	
Health Disengagement	Lower use and distrust of the health system and potentially undetected serious problems affect the way patients interact with the healthcare system.	
Medical Conditions	Existing, recurring health issues lead to specific healthcare needs.	
Mental Health	Mental health issues and forms of stress affect the need for counselling and related therapy.	
Social	Living situation and social network have an impact on how people interact with the healthcare system and potential health problems.	

Graph 6: Structure of patient journeys

Stages	Prevention	Diagnostic	Treatment	Aftercare
Doing	<ul style="list-style-type: none"> • Everyday health habits • Illness/accident occurs • First interaction with healthcare sector 	<ul style="list-style-type: none"> • Direct interaction with hospital • Process until diagnosis is provided 	<ul style="list-style-type: none"> • Treatment advised to cure the diagnosed problem • Potentially several stages 	<ul style="list-style-type: none"> • Steps towards full recovery • Efforts to return to healthy everyday life (back to prevention stage)
Thinking	 Thoughts of persona; more along rational lines			
Feeling	 Feelings of persona; more along emotional lines			
Experience	 Satisfaction level, interaction intensity & cost commitment			
Pain Points	 The most pressing complaints of the persona at each stage			

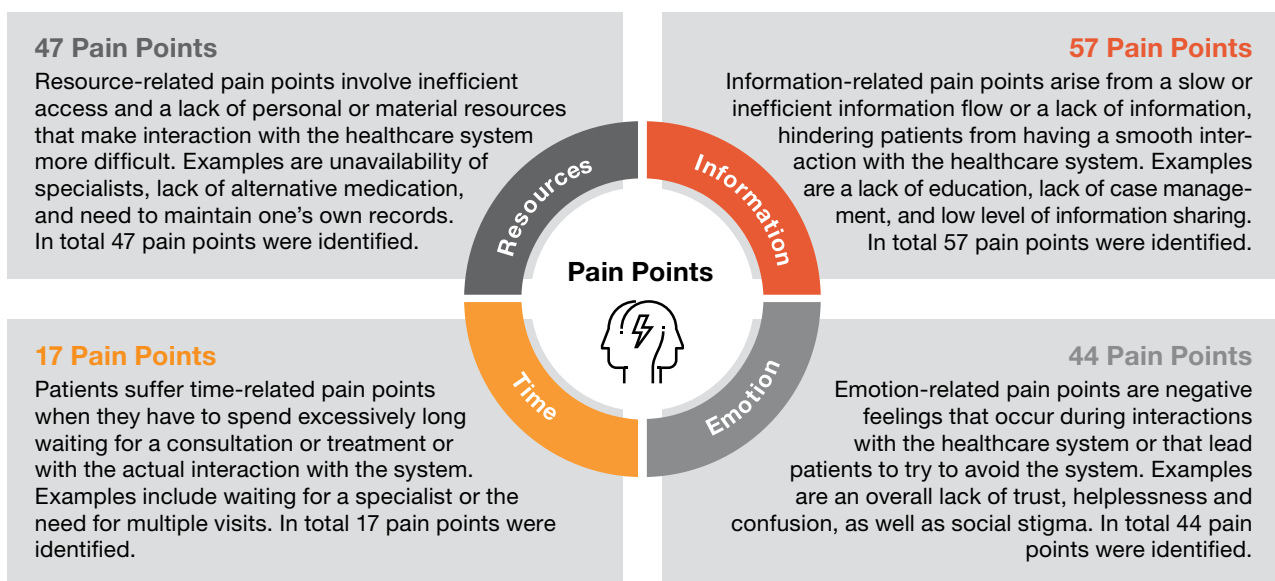
Across all six personas we identified 165 pain points experienced by patients. These pain points are the factors that make patients' experience of interacting with the healthcare system unpleasant. We clustered the pain points into four main categories: information, emotions, resources and time (see Graph 7).

The following heat map illustrates the intensity of pain points for each persona. Overall, information-related pain points are the most intense for all personas (see Graph 8).

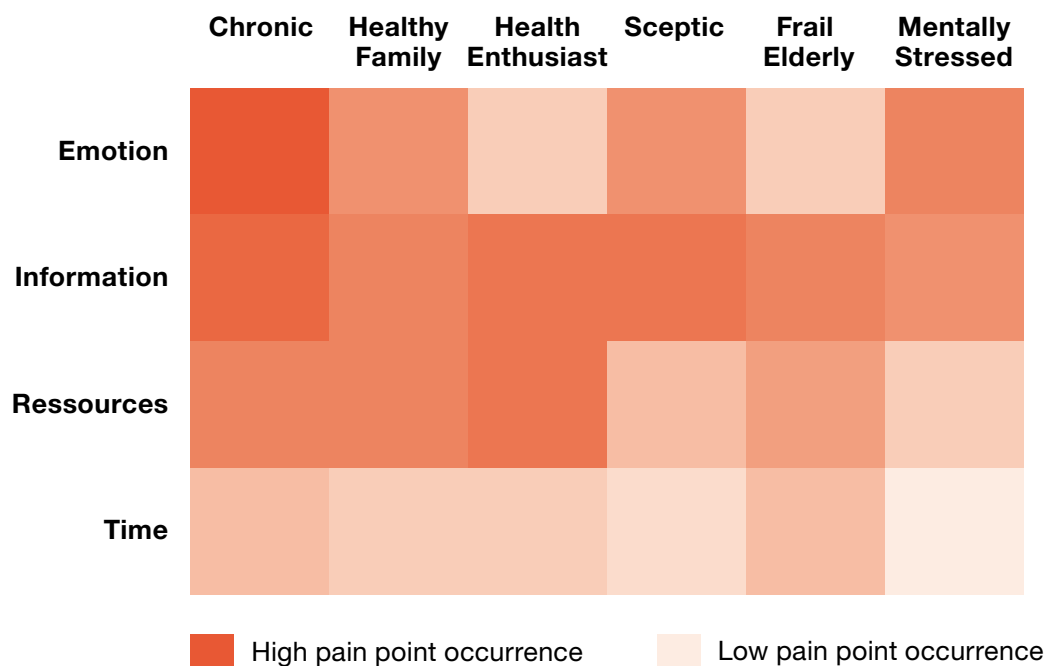
Most pain points occur because of information management issues

Of all the listed pain points, 35 % occur because of insufficient information. Interviewees often mentioned the limitations of paper-based administration and the inefficient flow of data that results (between doctors and between doctors and patients). This leads to constant repetition of patients' problems and a loss of time and money. Information-related pain points are consistently relevant for all personas. For instance, the frail elderly struggle with maintaining their patient files, while health enthusiasts find it more difficult to lead a conscious lifestyle because of a lack of proper education about healthcare.

Graph 7: Pain point overview



Graph 8: Pain point heat map



Lack of trust in the healthcare system is common

The mentally stressed and sceptic personas are the two most emotionally affected types, with 57 % and 44 % of their pain points respectively falling into the emotion-related category. An overall lack of trust in the system is widespread among Swiss patients. Mistrust mostly occurs because patients feel they are badly informed about treatment decisions and are not involved in the decision-making process. Patients also feel insecure about the quality of diagnoses and treatment decisions, which is why they often seek second opinions. For instance, one interviewee said: “I often feel helpless and confused before and after appointments and I’m sure they [the doctors] want to sell me something even if I feel completely fine!”

The availability and accuracy of resources is still insufficient

The patients interviewed complained about the lack of availability of doctors and treatments. Health enthusiasts are most likely (23 %) to suffer pain points related to personnel and technology resources, and the frail elderly often criticise the access to personnel resources.

One interviewee in this group said: “I struggle to go to physical appointments with my doctor because of my physical barriers”. Patients are open to technology-driven solutions that would help tackle these challenges. However, there is still a lack of support from the industry for these types of resources. For example, health enthusiasts said that they use or are eager to use wearables to measure their health data. However, they feel that doctors do not use the data anyway. They also raised the criticism that wearables are either too expensive or measure their activities poorly.

Too much time is spent in waiting rooms

Time-related pain points occur the least frequently, accounting for only 10 % of all pain points. However, all persona groups consider the time spent at doctors or in hospitals waiting for appointments as a major hurdle. The mentally stressed and healthy families in particular struggle with slow processes and a lack of transparency regarding the waiting times required. By comparison, chronics and the frail elderly spend a lot of time within the healthcare system, but are more willing to take their time for appointments.



Technological trends in the healthcare industry




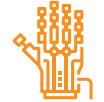






Technology-driven trends are rapidly transforming the global healthcare industry

We found ten key technological trends with the potential to disrupt the Swiss healthcare sector (see table 1). The list of possible applications ranges from those that are fully market-ready and established (e.g. wearables and big data) to solutions that are still more or less fiction (e.g. full brain simulation). Whatever the stage of maturity, however, selected specialists in the market have already launched initiatives for all these technologies.

All the trends described above have the potential to resolve a Swiss patient's pain points. The exceptions are body augmentation and body regeneration. While these two trends might potentially arouse the interest of Swiss patients, as things stand at present they don't resolve any of the pain points identified and are not actually relevant in terms of their health life cycle.



Table 1: Emerging technologies applied in healthcare

Technology/Description*	Exemplary applications	Examples
 <p>Big data & data management Gathering and managing large volumes of complex and often unstructured data to gain insights about patients, illnesses or levers to improve existing practices</p>	<ul style="list-style-type: none"> - Basis for AI applications - Medical records - Distributed ledgers 	<ul style="list-style-type: none"> - Flatiron Health, Inc. - Lyfegen
 <p>Wearables & sensors Smart electronic devices worn as accessories or implants to gather physiological or movement data</p>	<ul style="list-style-type: none"> - Medical devices - Sport wearables - Implanted sensors - Smart textiles 	<ul style="list-style-type: none"> - Google Glass - Fitbit, Inc.
 <p>Artificial Intelligence (AI) Algorithms with the ability to perform tasks associated with intelligence, such as reasoning, realising and learning from past experience; closely linked to data management</p>	<ul style="list-style-type: none"> - Diagnostics - Organisation of patient journeys - Development of treatment and prevention plans - Natural language processing 	<ul style="list-style-type: none"> - IBM - DeepMind
 <p>Robotics Electromechanics-based solution where the programmed robot is able to execute a specific task or communication element</p>	<ul style="list-style-type: none"> - Robotic nurse assistants, e.g. to lift patients - Surgery assistants, e.g. daVinci - Disinfectant robots - Companion robots 	<ul style="list-style-type: none"> - Kuka AG - Anybots® 2.0 Inc.
 <p>Telemedicine Healthcare provided from a distance, leveraging telecommunication and information technology</p>	<ul style="list-style-type: none"> - Virtual appointments - Digital treatment platforms 	<ul style="list-style-type: none"> - WebMD LLC - HealthTap, Inc.
 <p>Mobile health Data processing applications used through mobile devices to support communication or provide and visualise information for the user</p>	<ul style="list-style-type: none"> - Health apps in general - Diagnostics support - Second opinions - Patient boards 	<ul style="list-style-type: none"> - SIMpill® - Wellpass, Inc.
 <p>Biotechnology & gene therapy Manipulating or genetically engineering living organisms for health purposes</p>	<ul style="list-style-type: none"> - Genomic editing - Stem-cell treatments - Personalised medicine 	<ul style="list-style-type: none"> - Mayo Foundation for Medical Education and Research - BDI Group
 <p>Digital simulation Virtual modelling a process, product, service or its effect that improves prevention and allows more precise planning</p>	<ul style="list-style-type: none"> - Digital twin - Full brain simulation 	<ul style="list-style-type: none"> - SimforHealth
 <p>Body augmentation Technology that improves the productivity or capability of the body, overcomes current limitations or cures illnesses</p>	<ul style="list-style-type: none"> - Artificial retinas - Intelligent prostheses (arms, legs, hands, etc.) 	<ul style="list-style-type: none"> - Synthes - American Macular Degeneration Foundation (AMDF)
 <p>Body regeneration Developing synthetic or grow-to-order organics to replace damaged body parts such as major organs and skin</p>	<ul style="list-style-type: none"> - Lab-grown skin - Lab-grown inner organs (lung, kidneys, heart, etc.) 	<ul style="list-style-type: none"> - Demedi-Dent GmbH und Co. KG - Life Extension Advocacy Foundation

*Ordered based on the trend's efficiency in resolving pain points

Key findings on technological trends

In the following section, we elaborate on how technological trends are able to address the pain point categories (information, emotion, resources, time) we have identified.

Data management and mobile health interfaces enable more transparent, effective and user-centric information management and sharing

Insufficient information management and sharing is one of the most serious pain points for patients. They struggle with a lack of consistent data flow that results in redundancies, loss of information and misunderstandings between patients, doctors and other stakeholders.

This shortcoming can be addressed by two technologies. Consistent data management based on electronic patient records enables digitised workflows that ensure more transparent data documentation. Healthcare applications with personalised and user-centric interfaces help improve information sharing and understanding.

Ultimately, all this benefits patients by providing a transparent environment enabling them to interact with doctors and access information about their diagnosis and treatment. This results in greater understanding and clearer communication with medical staff throughout the entire treatment process, enabling patients to get more actively involved in their own health.

Combining more effective and user-centric information sharing with AI creates more confidence for patients

Data and AI-based diagnosis and decision-making help recognise patterns in data more reliably for a variety of variables and scenarios. For example, algorithms can help predict the effectiveness of treatment by processing a large amount of historical medical data, research results and the individual patient history, and comparing and contrasting symptoms, causes and treatments.

This technology even allows digital simulations to compare treatment progression scenarios for individual patient cases. Doctors can share and better explain these databased diagnoses and treatment options supported by user-centric interfaces. This fosters patients' trust in the decisions made by healthcare providers.

Digital devices and user-centric interfaces increase resource availability

The challenges of resource availability can be addressed using smart electronic devices such as wearables and mobile health interfaces combined with data management. These days almost all patients have access to devices with sensors that are able to collect vital data about their state of health. Allowing easier measurement of data such as heart rate, movement or sitting and sleeping behaviour, these wearables have huge potential.

Collecting, analysing and monitoring a large amount of patient data reduces the number of physical visits to doctors and provides a broader database. Doctors in their turn will be able to use digital interfaces to present the data obtained in user-friendly form. Systematic use of these tools will free up scarce personnel and improve the availability of resources in healthcare for both patients and doctors.

AI-optimised patient processes and consistent use of telemedical tools reduce waiting time for patients

Patients find repeated and time-consuming visits to the doctor or long waiting times before treatment particularly unpleasant. Telemedicine and artificial intelligence (AI) address this pain point. Telemedical meetings between doctors and patients substantially reduce the waiting time for an appointment and the travel time to and from appointments, which in turn reduces stress and costs for patients. In addition, telemedicine gives patients in rural areas access to specialists.

AI has great potential in terms of tackling the problem of bureaucracy and inefficient administration, relieving doctors from time-consuming administrative tasks and giving them more time to spend with their patients. By automating and improving processes, artificial intelligence can benefit both patients and medical staff. By optimising patient processing planning it can reduce the waiting time and length of stay for patients, and it can also help medical staff in their day-to-day work.

Implications of technology for players in the healthcare system

Now that we've discussed the extent to which technological innovations address our identified pain points, in this chapter we'll focus on the implications for players in the healthcare system. An important point to realise is that from the patient's point of view, pain points arise primarily through contact with hospitals and doctors rather than with insurance companies and pharmacies.

Hospitals need to get on top of their data management game

Data is key to improvements in healthcare and the basis for technological innovation. Access to data has to be optimised in terms of both process efficiency and user experience. This means that hospitals need to develop the competencies and invest in IT systems and capacities to be able to use, manage and protect this data. Taking a pioneering role here and positioning themselves strategically may prove worthwhile for hospitals in the future. Partnering with other hospitals and IT providers is a way forward to handle the related investments and challenges and reduce risks, especially those related to IT security and data protection.

Outpatient care providers and doctors need to become digital champions

The implications of technological innovation for outpatient care providers are largely identical with those of hospitals. Investments in IT capabilities and new processes are particularly relevant here, as is the willingness of doctors to recognise the opportunities offered by these tools. Doctors, both in inpatient and outpatient care, must learn how to apply these new tools efficiently. This way they will be able to use, manage and share data with patients and other healthcare players and exploit the full potential of new technologies.

Applying technologies that support electronic patient files, digitalised workflows and interfaces, and databased decision-making frees up time for patient care, improves the quality of treatment and exploits potential cost savings. This changes the role of doctors. Indeed this role needs to change, as patients are increasingly expecting to be involved in gathering information and making decisions. In the future doctors will serve more as guides and health managers and less as the sole providers of information.



Conclusion

Players in the healthcare system have to fully understand patient journeys, needs and pain points before investing in and implementing new technologies. Patients currently struggle most with insufficient information sharing and resource access, coupled with a lack of trust. For this reason we believe that the greatest medium-term potential in Switzerland lies in data management, artificial intelligence, wearables and sensors, and mobile health interfaces. Given that these approaches will fundamentally resolve the challenges reported by patients themselves, we believe that in the years to come the industry will be shaped by healthcare businesses that focus on these key technologies.

However, this is only true for the moment. Patient journeys, needs and pain points change. It's also important to bear in mind that some healthcare players are highly specialised in certain patient groups with very specific needs and pain points, so they have to constantly learn about their respective patients and adapt their technological strategy accordingly.

All this will fuel a fundamental paradigm shift in medicine. This shift will require substantial investment and strong partnerships between healthcare providers, but it will also dramatically improve patient journeys. By adopting the approach and frameworks developed for this study, healthcare players will be able to design and implement a user-centric technology strategy that will enable them to them succeed in the future and unleash the full potential of digitalisation.

“...we believe that the greatest medium-term potential in Switzerland lies in data management, artificial intelligence, wearables and sensors, and mobile health interfaces.”



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