Health 4.0 made in Germany
Global digital health market is booming, Europe one of the three regions to look at – Germany now to create connected infrastructure

Key hypotheses on the Digital Health market

1. The Digital Health market is expected to grow by c.24% p.a. and surpass USD 650 bn by 2025 – driven by growing patient numbers and technology

2. Europe is currently still #2 for Digital Health after the US – however, we expect China to drive the digital health market in the coming years

3. Germany needs to be quick to provide the connected infrastructure and clarify regulations to allow the digital health market to fully develop – different scenarios to be considered

Source: Roland Berger
Global Digital Health market continues to show double-digit growth and surpass USD 650 bn by 2027

Digital health market development 2015 – 2025 [USD bn]

**EMR/EHR**
- Continuous and stable growth due to increased adoption
- Integration of wearables to EHR will be next major growth step

**Telehealth**
- Steadily growing market due to growing demand for personal health care, increasing government expenditure and the unmet medical needs in rural places

**Mobile Health**
- Main value drivers will be the chronic disease management (46% of mobile health segment) and diagnostic services (15% of mobile health segment)

**Wireless Health**
- IoT is driving changes through rapid reduction in costs (estimate lead to $63bn in global savings)
- Within 6 years >50bn devices will be connected to cloud systems, 30% of these within the Healthcare Sector

Source: Markets and Markets, Grand Market View, Transparency Market Research, BCC Research, Roland Berger analysis
EU second after the US but APAC and especially China will drive the market in the future

Digital health market per region 2018 [bn USD]

US
- US represents the largest market for Digital Health, driven by the early adoption of innovative health services by patients and payers
- Overall high number of companies providing mobile health service and developing health apps

EU
- EU represents a major market for digital health, especially
  - UK: Early adoption of telecare services as well as significant central government agenda for telecare
  - Germany: Leading market of medical device companies strengthening telehealth and mobile health segment

APAC
- Besides strong uptake of solutions in Japan, China is expected to become a major market
- Chinese government continues to support eHealth to address long-standing inefficiencies and unmet requirements for the health care system, esp. in rural areas

Source: Markets and Markets, Grand Market View, Transparency Market Research, BCC Research, Roland Berger analysis
In a recent study with SPECTARIS we have analyzed the status quo and expectations of digital health in Germany

Core study results: Health 4.0

> Digitalization of the healthcare industry offers enormous opportunities:
  - Significantly improved patient care
  - More efficient service provision
  - New high-tech medical products and new markets for the German medical technology industry

> In the field of medical technology alone, c. 10,000 additional jobs will be created

> Study participants expect sales of around EUR 15 billion from digital products and services in 2028

> Equally, the study illustrates the enormous pressure to act:
  - Not even 30 percent of medical technology companies invest more than 2.5 percent of their sales in digitization projects
  - Two thirds of the participants rate the healthcare industry as low-digitized
  - 36 percent of medical technology companies have a clearly formulated digital strategy
  - 98 percent of respondents would like to get more support from politicians

Source: SPECTARIS- and Roland Berger
10 recommendations for action provide concrete starting points for accelerating digitization

Overview of recommendations for action

### 10 Recommendations for Action for the Digitization of the Health Care Industry

<table>
<thead>
<tr>
<th>Companies</th>
<th>Healthcare stakeholders</th>
<th>Politics</th>
</tr>
</thead>
<tbody>
<tr>
<td>2. Increasing investment in digitization in medical technology and hospitals</td>
<td>4. Simplifying approval processes for new, digital products</td>
<td>8. Developing an infrastructure program</td>
</tr>
<tr>
<td></td>
<td>5. Developing fast and transparent processes for the reimbursement of digital products</td>
<td>9. Setting minimum technical requirements that promote interoperability</td>
</tr>
<tr>
<td></td>
<td>6. Promoting digital model projects through a central information platform and transfer to the standard care system</td>
<td>10. Creating a uniform German data protection standard</td>
</tr>
</tbody>
</table>

> In order to accelerate the digitization of the health care industry and medical technology and to develop Germany into the leading market for the digitized health care industry, joint efforts of all parties are necessary.

> All players in the healthcare system including companies and politicians have to be involved in and contribute their part.

> The recommendations for action have been developed jointly by SPECTARIS and Roland Berger and show concrete starting points – the authors are happily available for a joint exchange.

Source: SPECTARIS; Roland Berger
We will see the Healthcare infrastructure and decision making processes being digitized and disrupted.
The traditional patient-physician-journey mainly relies on face-to-face interaction

Current patient-physician-journey

- Early detection of symptoms
- Self diagnosis
- Online treatment research

Appointment
- Appointment for physician visit

Diagnosis
- Anamnesis
  - Pre-condition check
    - Lab testing
    - Medical referral
  - Diagnosis

Treatment
- Treatment options
  - Option evaluation
    - Drug prescription
    - Drug pick-up from pharmacy
- Filing medical report

Documentation
- Sharing medical report with patient

Monitoring/Follow-up
- Follow-up check
  - Stop, continue or switch

Source: Roland Berger
Many future touchpoints of the patient-physician journey are complemented by new services

Overview of new services along the patient-physician journey

Source: Company websites, Roland Berger
Endgame: Patient care to be fully automated by data, apps and algorithms

Vision – Automated diagnosis and treatment, anywhere, anytime

**Symptoms**
- Automatic control of illnesses
- Exact diagnosis of specific conditions
- Subjective perception and decision to act

**Data+AI**
- Analysis with AI based on personal data and treatment recommendations
- EHR – Central collection of patient data linked with interfaces along the healthcare value chain

**Teledoctor**
- If necessary, complementation by doctor

**Therapy**
- Appointments
- Therapy recommendation + e-prescription
- Selftreatment

Data and algorithm will monitor the whole process and link all steps

Source: Roland Berger
Algorithms and data will determine healthcare provision, but who will own them?

**Scenario 1**
Established players at the pole position:
Healthcare insurances expand their portfolio with existing data pool and AI based services

**Scenario 2**
Supremacy of new data players:
Amazon, Google and Co + independent data brokers get access to patient data – first for single illness, next step for everything

**Scenario 3**
Independent offerings along the healthcare value chain:
Connected with patient records but without integration
The scenarios depend on different parameters – But all provide value added patient services

Basic requirements for the three scenarios

**Scenario 1:**
**Established players at the pole position:**
Expanded data portfolio of insurances and other players.
Open regulations allow usage of a common data model with a transfer into specific services

**Scenario 2:**
**Supremacy of new data players:**
Data sharing is caring – patients allow data access for personalized value added services

**Scenario 3:**
**Independent offerings along the healthcare value chain:**
Policy fosters EHR initiative, data are stored in a central patient record enabling a seamless patient journey

Source: Roland Berger
Established players at the pole position: Healthcare insurances expand their portfolio

Strong position of well known players due common data model

Scenario 1

Data hubs of the healthcare insurances and hospitals

One data model in use: Collection, analytics and transfer

But different apps and service models

Intelligent diagnostics and prediction of diseases
Transparent information and full time services
Optimized treatments
Direct delivery
Personalized reimbursement models

Source: Roland Berger
Supremacy of new data players: Amazon, Google and Co get access to patient data

Data sharing for caring – Patients allow data access for value added services

Scenario 2

- Multichannel patient data collection
- Analytics and prediction
- Numerous healthcare services with significant value added for the patients
Independent offerings along the healthcare value chain: patient records as central data pool

Patients benefit from additional services

Scenario 3

Situation: health problems during a business trip

1. Mobile, AI-based diagnosis via an app

2. Confirmation and e-prescription via video-conference with physician

3. Drugs delivered to hotel / office within two hours

Continuous data transmission by tracker or AI based app

**DIGITAL**

- Tracker
- Symptoms
- Early detection

- Self-diagnoses and per telemedicine Appointments via app
- Patient record with data in control of the patient
- Intelligent, IT-based diagnoses and therapy recommendations
- Direct reim-bursement after data transfer to health insurance
- Continuous remote care via sensors and apps

Data / EHR

Transmission of patient data

Source: Roland Berger
Healthcare players have to react quickly

Strategic consequences for healthcare players

- Decoupling and extinction of value creation stages

- New customer offerings, e.g. fostering patient empowerment

- New forms of corporations e.g. with startups, competitors, platform providers

- Implementation of AI and data based technologies, new interfaces

- New working & decision making: agile and iterative

Source: Roland Berger
A bold vision and rapid implementation of initiatives are needed

How to scale digital – Aiming far and implementing fast

**Vision**
"Be bold"
"We are the first fully digital health insurance company."

**Discover**
"Curate and assess ideas"
e.g. screening of technologies within market

**Design**
"Estimate success"
e.g. development of new products and services

**Develop**
"Develop strength"
e.g. derivation of processes and IT requirements

**Deploy**
"Scale fast"
e.g. internal implementation, partnerships

---

"Be bold"
A transformative vision is characterized by a clear and bold declaration aiming to boost ambition for supreme goals and stimulate imagination of all stakeholders.

"Scale fast"
Speed and scalability of digitization are decisive success factors for differentiation from the competition.

Source: Roland Berger
To explore these opportunities, pharma companies should design digital health offerings following a set of 10 winning principles

### Principles of winning digital health offerings

| **Interaction** | > Follow customer journeys – target specific interactions in the healthcare system  
> Connect all stakeholders across the healthcare system |
| **Value-added** | > Overcome disconnect between healthcare provider and patient  
> Use smart solutions, offer tangible value added: time, money, quality, outcomes |
| **Platform/ connectivity** | > Get the initial patient connection right – ubiquitous digital channels: Social media, website, apps as touch points (mobile network of connectivity) |
| **Data** | > Take advantage of comprehensive user data  
> Ensure accessibility and security |
| **Intelligence** | > Gather meaningful insights  
> Use Big Data to become predictive, not reactive |
| **Device** | > Use multiple interfaces to suit the patients' lifestyle  
> Link with technology standards and decide on closed loop vs. open platform |
| **Sensor** | > Give precise measurements  
> Consider patient convenience with e.g. wearable sensors |
| **Pharma-ceutical** | > Add new technology dimension to core product  
> Enhance value proposition beyond the molecule |
| **Regional** | > Reflect regulatory & care environment  
> Understand and accept local pain points – adjust technology and value added |
| **Data security/ compliance** | > Ensure compliance in stakeholder communication and data security for patients |

Source: Roland Berger
Roland Berger supports – From analysis to vision to implementation

Typical projects in Digital Health

**Research, studies, trends**
Publication, trend analyses and technology screening within the fields of Healthcare, Digitization, Megatrends etc.

**Inspiration days and rise of awareness**
Workshop series and inspiration days in order to create awareness towards new market, business and technology trends

**Development Eco-system Healthcare**
Idea generation, derivation of customer needs, analysis, identification of focus space, development of concrete concept

**Cultural and organizational transformation**
Boot camps, workshops, learning journeys, reorganization for creating an open-minded and innovative culture

**New products/service development**
Development and prototyping of new services, products, business models, from Design Thinking sprints to Proto-typing/Launch and venturing services

**E2E process digitization**
Process analysis, derivation of optimization potential, use of suitable technologies, implementation

**Innovation Lab & Hub deployment**
Develop an internal corporate innovation hub, customized approach (e.g. company and industry specific)

Source: Roland Berger