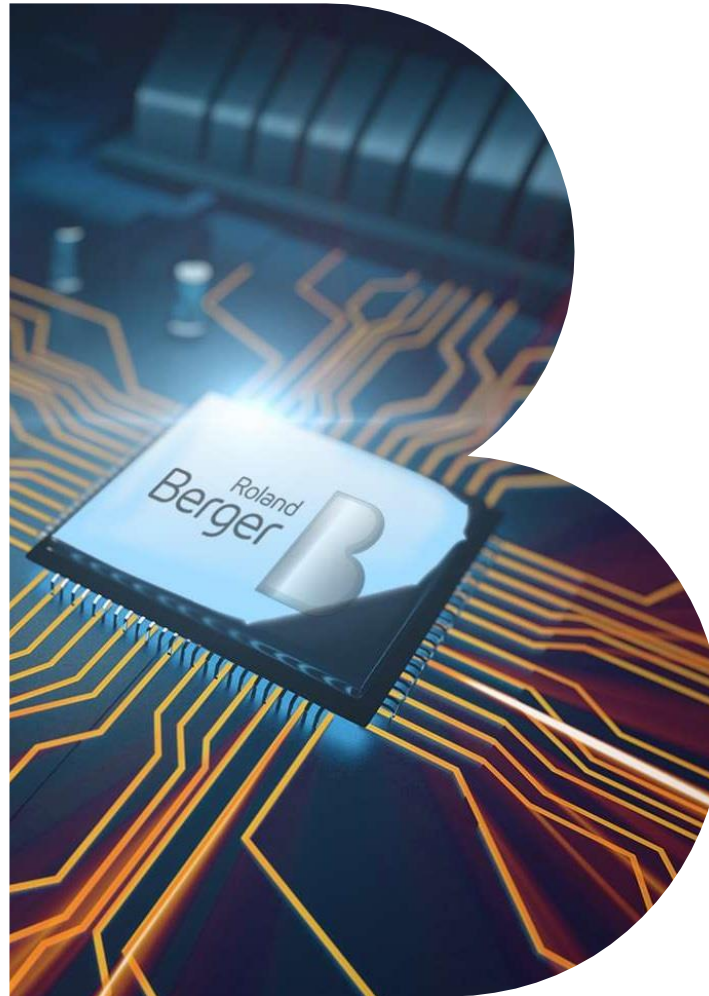


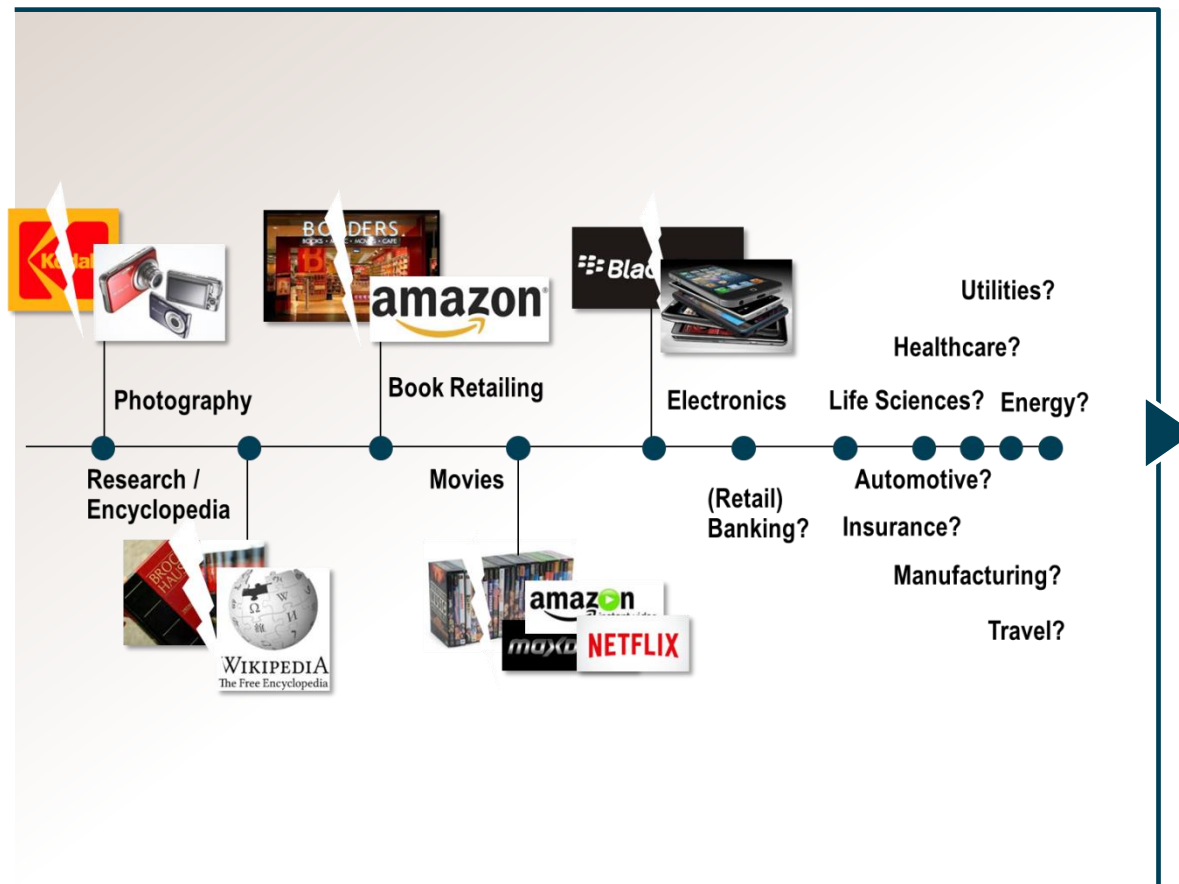
# What's the market pull for E-Health?

Presentation at 9th Berlin  
Conference on IP in Life  
Sciences – Digital Health  
Solution

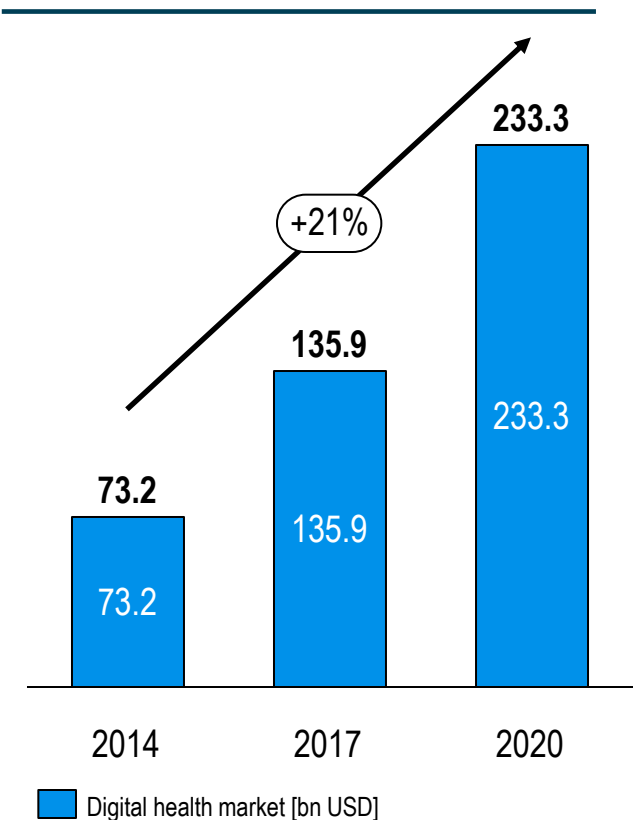


# There is clearly a market pull towards digitalization, across industry and in healthcare

## Digitalization is disrupting traditional industries...



## ...and creates strong pull in healthcare



# Across industries, a technological and a sociological revolution are under way

## Trend overview

### A TECHNOLOGICAL REVOLUTION



#### TECHNOLOGY ADVANCES

- > The world is connected via the internet
- > Powerful computing & communication devices are increasingly mobile



#### DATA VOLUME INCREASES

- > More and more digital data is generated
- > The belief in mutual enrichment by exchange fuels data sharing



## DIGITAL TRANSFORMATION

#### BIG DATA CHANGES TRADITIONAL BUSINESS

- > Existing businesses must identify the value of data for their industry if they want to be sustainable in the future



### A SOCIOLOGICAL REVOLUTION

#### CONSUMER/PATIENT BEHAVIOR CHANGES

- > Consumers/patients have increasing access to transparent information
- > The 'informed patient' is transforming to the 'participating patient'



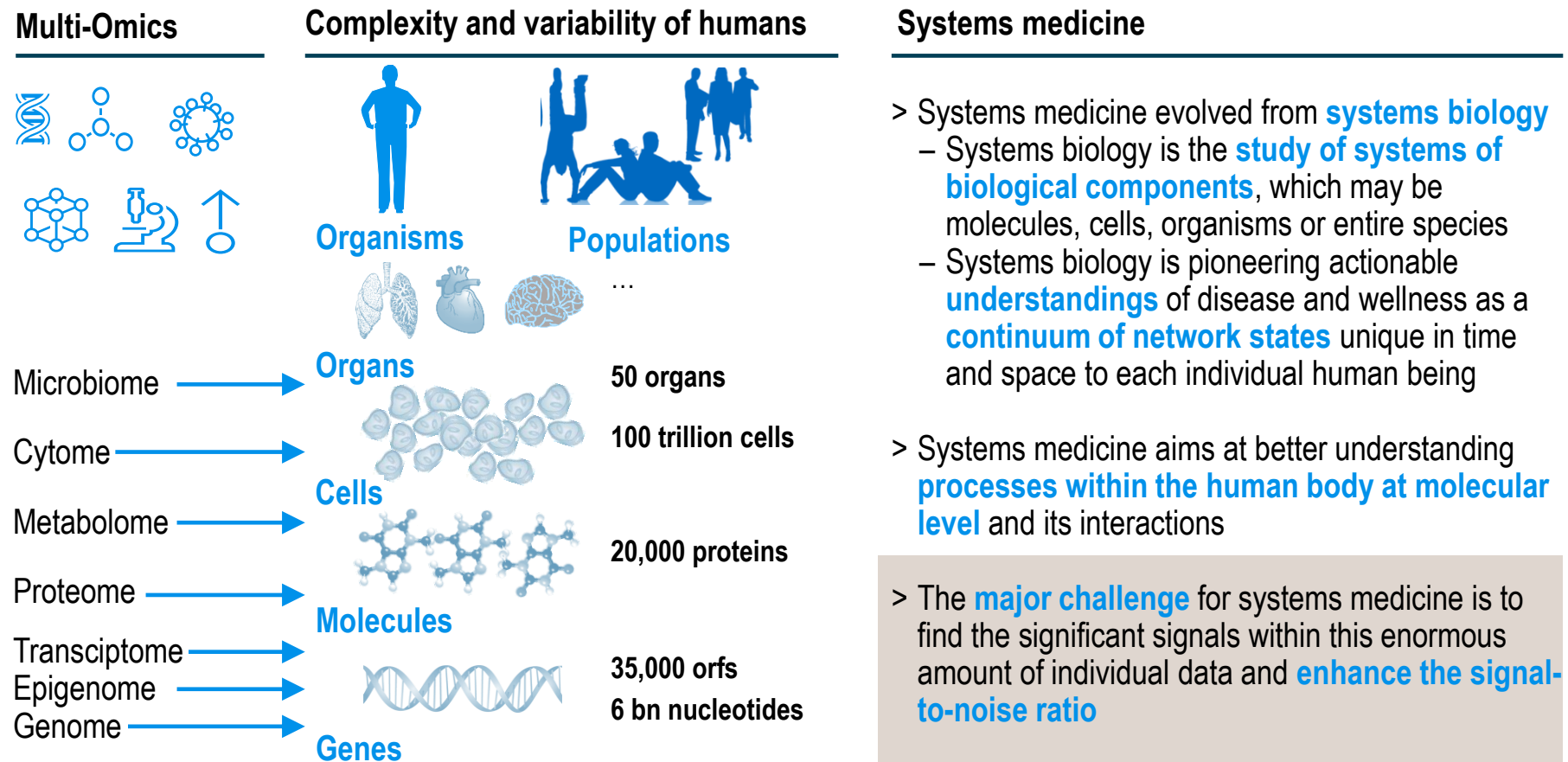
#### START-UP ACTIVITIES INCREASE

- > VCs believe in business models that are designed for this new environment



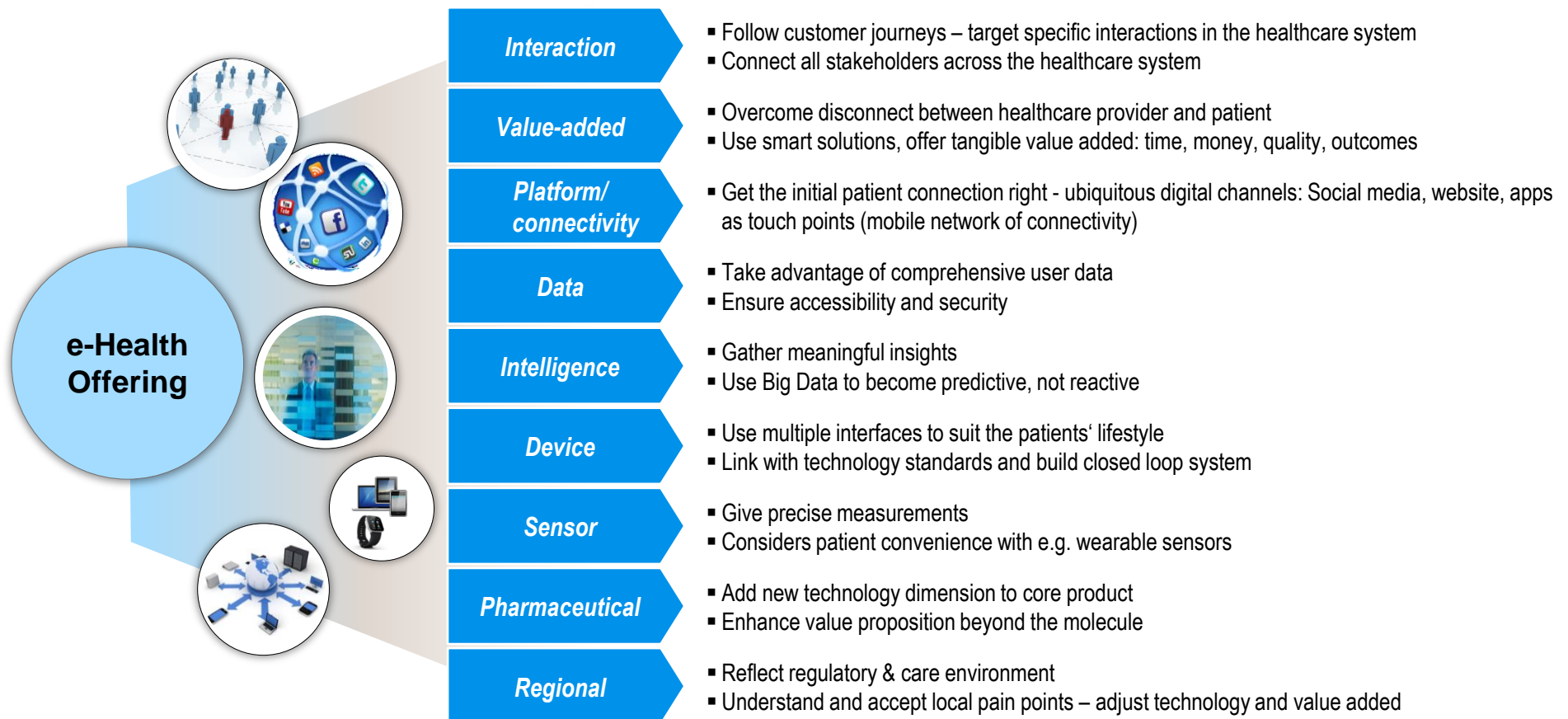
# The major challenge in modern medicine is the interpretation of enormous amounts of data within human biological networks

## Holistic approach to studying complex biological systems



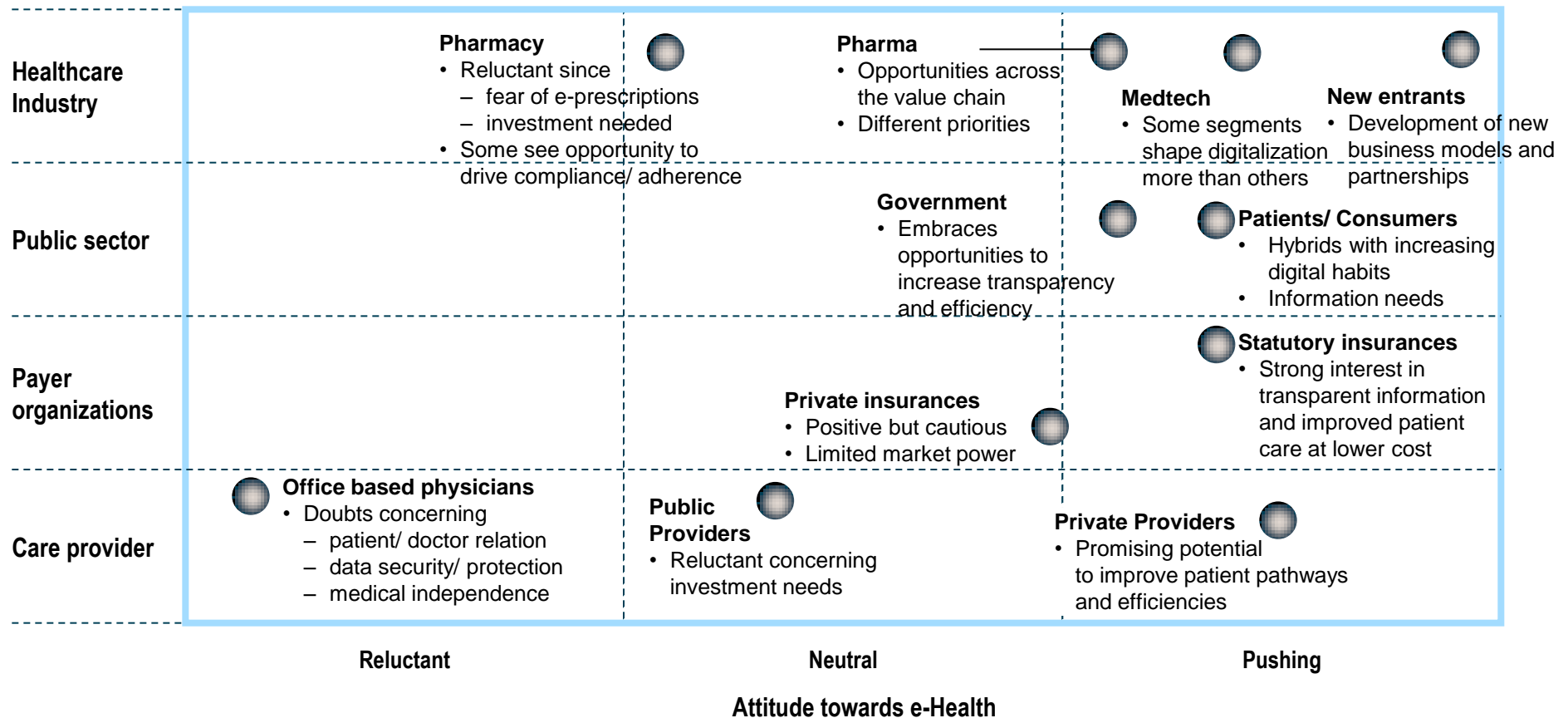
# In our view, winning Digital Health offerings must fulfill a clear set of principles to make it attractive

## Principles of winning Digital Health offerings

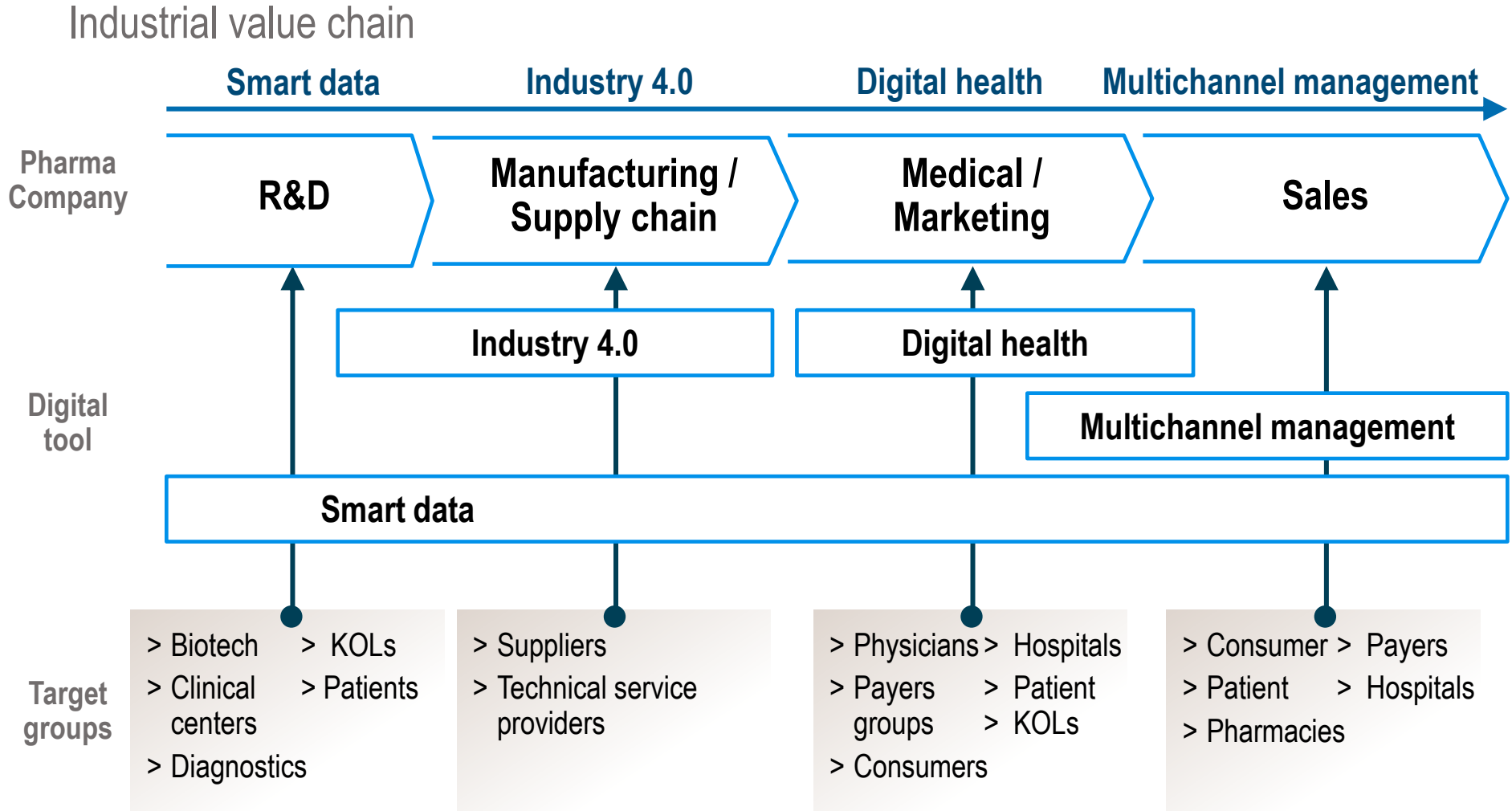


Market pull is mainly driven by new entrants, consumers, insurances, government and industry – players move to the right

Market pull of selected healthcare players – European perspective



# Industrial healthcare players identifying opportunities across the value chain



# Roche decided to exploit the market potential stemming from digitalization mainly in the R&D area

## Roche's strategic transaction regarding Foundation Medicine



- > In 2015, **Roche** acquired a majority stake in **Foundation Medicine**, a new player in the field of **molecular information in oncology**
- > FMI supports physicians by providing comprehensive molecular information to characterize a tumor that is being matched with approved targeted therapy options and novel treatments under development
- > Collaboration leverages both companies' strengths to advance the progress of **personalized treatments** for patients with cancer
- > The partnership includes both a **broad R&D collaboration** with the potential for more than USD 150 million funding by Roche to accelerate FMI's new product development as well as **commercial collaboration** agreements aimed at expanding the global sales efforts for FMI's current and future products

## R&D approach

- > Focus of the R&D collaboration will be on developing genomic profile tests for cancer immunotherapies and for continuous blood-based monitoring
- > **Roche** will be able to utilize FMI's proprietary molecular information platform to **standardize clinical trial testing**
- > Roche aims for **comparability of clinical trial results** for R&D purposes **to improve decision making** and support optimization of patient care as oncology management becomes more complex
- > Digitalization will further link R&D with real life treatment data

# New technologies have the potential to disrupt the Medtech and Pharma manufacturing world

## Selected Industry 4.0 technologies and use cases

### Virtual Manufacturing

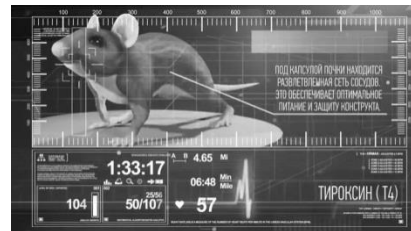
**SIEMENS**



- > 3D CT data and the NX-CAD/CAM software from Siemens PLM enable **simulation and design of customized and patient-specific artificial joints** with still a high degree of process chain automation

### Additive Manufacturing

**3dbio**



- > In March of 2015, 3D Bioprinting Solutions became the first group to **successfully bioprint and transplant a thyroid gland** for a mouse

### Predictive maintenance

**Microsoft** **ThyssenKrupp**



- > ThyssenKrupp uses Microsoft **predictive analytics** software for its **elevator** maintenance support
- > Elevators are connected to a cloud and transfer data from sensors to the system for predictive and even preemptive maintenance

### Cyber physical systems

**Rexroth**  
Bosch Group



- > On the assembly line at the Bosch Rexroth plant Homburg / Saar, an RFID chip on the **work piece steers its own production steps** through nine intelligent work stations
- > Displays show the employees the appropriate work instructions

# Digital offerings are manifold and will change the way how people are treated tremendously – Pharma's offerings will be impacted

## Apple Health



- > Currently focuses on collection of health and fitness information from third-party apps
- > Glucose monitor in development using non-invasive sensors
- > Takes advantage of pedometer, blood pressure, hydration and heart rate screening

## Bayer BETACONNECT™



- > Prescribes injection reminders, injection depth and speed based on patient preferences
- > Stores and shares injection information (date, speed, volume) and symptoms and syncs live with smartphone app
- > Shares the data with healthcare providers via an online dashboard
- > FDA approval in 09/2015

## 23 and me



- > FDA and CE approval
- > DNA analyzer that enables users to learn about and explore their DNA
- > Extrapolates ancestry reports and raw data from its database
- > Future use for health-related genetic information anticipated

## Proteus digital



- > Available in the USA
- > Marketed as an intelligent medicine platform integrating patients, patients' relatives and treating doctors
- > Includes wearable and ingestible sensors
- > Developed in cooperation with Novartis and Otsuka Pharmaceuticals
- > FDA application for first drug/device combination (ABILIFY) ongoing

# Digitalization within healthcare sector gives birth to new business models enabling self-monitoring, higher efficiency & convenience

## Major Digital Health trends

### Quantified health



e.ventures says: "Wearables becoming smarter"

- > Tracking of physical activity and other health indicators due to rise of wearable technologies and sensors
- > Features of new devices going beyond fitness and are more sophisticated than ever



**Narrative** Record memories on the go



Activity & diet tracking



Fitness & sports activity tracking

### Tele-health



"Extending the point of care"

- > Telemedicine services connecting patients directly with doctors via video allow for higher convenience at lower costs
- > Monitoring of at-risk patients simplified especially in the field of chronic diseases



**Dr DOCTOR ON DEMAND** Online connection to your doctor



Tele-health platform connecting doctors & patients

### Medication online



"Pharmacy reinvented"

- > Simplified process of getting prescriptions or receiving medication through faster submission technologies



Online pharmacy

So for moving forward – what are the guiding questions to be answered?

What are the drivers and hurdles for digital transformation of Pharma and Healthcare and how does it change the paradigm in modern medicine?

Where is the potential of the new paradigm in modern medicine and how can digital transformation help unlock this potential?

Which new business models emerge from the associated digital transformation?

How can the opportunities arising from digital transformation in pharma and healthcare be addressed?

# Strategic collaboration will become more important than ever for established players to succeed in the new business environment

## Conclusion

### Challenges

- > Implement out-of-the-box innovation into a highly regulated environment
- > Combine development cycles and know-how from IT and medicine
- > Open up for partnerships
- > Achieve quick wins to keep going

### Exemplary partnerships and initiatives of established Pharma players with other industries



- > Google and Sanofi collaborate in Diabetes Care



SANOFI



- > Roche acquires Big Data platform Bina Technologies for next generation sequencing



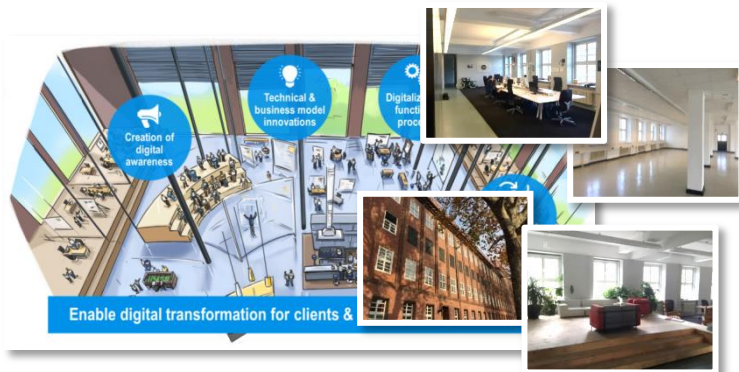
### Strategic cooperation to face new business reality

- > Pharma
- > Medtech
- > IT
- > Consumer industries
- > Telecommunications

On our first "Digital Health Day" on February 25th at spielfeld we are connecting industry leaders with promising start-ups

## "Digital Hub" in Berlin

- Strong network of digital-/tech-partners and start-ups
- Several top-companies working on digital projects, curated by RB
- 1,000m<sup>2</sup> multi-functional space
- Digital Academy
- Broad portfolio of services from inspiration formats to prototyping and change projects
- Big/Smart Data Lab



## Digital Health Day

- > Senior executives will meet innovative start-ups to discuss **disruptive and successful business models**
- > Clients will have the opportunity to **develop own ideas** through an idea generation workshop, and to develop and implement concepts in follow-on projects
- > **Selected participants:**

SIEMENS

LR Lohmann & Rauscher

SANOFI

Allianz

COLDPLASMA TECH

BAYER

METABOLOMIC  
DISCOVERIES

medlanes

GAIA  
MERCK

Roland  
Berger

