



# **AI in Healthcare – a holistic approach**

Holger Rank

Bosch Healthcare Solutions

Bosch Global Software Technologies



# Invented for life



# Who we are in figures



**90.3**

billion euros  
sales revenue



**3.1**

billion euros EBIT  
from operations



**417 900**

Bosch associates  
worldwide at year-end



**490**

Subsidiaries/regional  
companies in more than  
**60** countries

**Robert Bosch Stiftung**

Approx.

**219**

million euros  
funding in 2024

Approx.

**2.5**

billion euros  
funding for  
charitable work

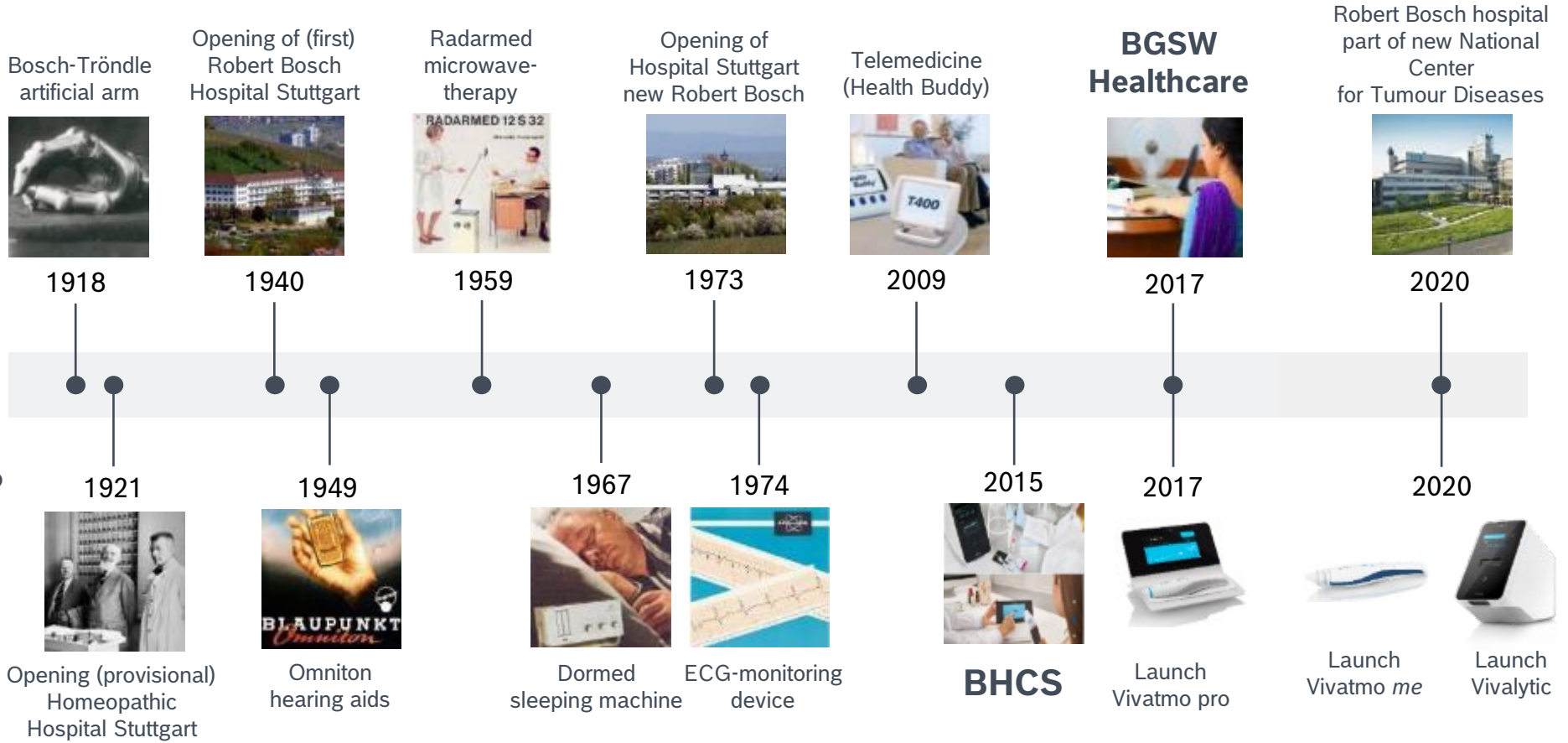
# Healthcare @Bosch

## Medtech has long been a part of Bosch's DNA



“It is inherent to the nature of medicine that its greatest concern is to cure the suffering and, where this is not possible, to alleviate their pain.”

Robert Bosch, 1941



# Bosch Healthcare

## Bringing experience in healthcare development to the customer

### BHCS

Bosch Healthcare Solutions GmbH  
HQ: Waiblingen, Germany

Laboratory Diagnostics  
Therapy Management  
Digital Products and Solutions



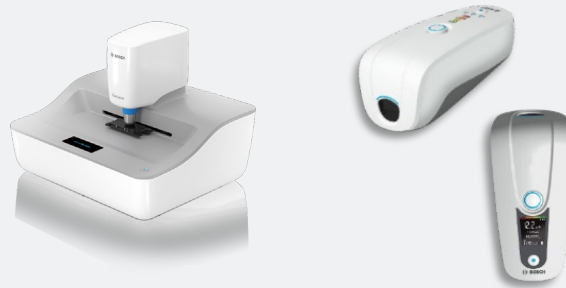
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✓ivatmo

### BGSW

Bosch Global Software Technologies Pvt. Ltd.  
HQ: Bangalore, India

Connected Products  
Embedded Technologies  
Enterprise IT  
AI & Data Science



✓ivalution

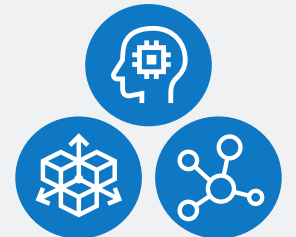
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### BGSW and BHCS in Healthcare

Digital Products and Solutions  
Software Engineering Services



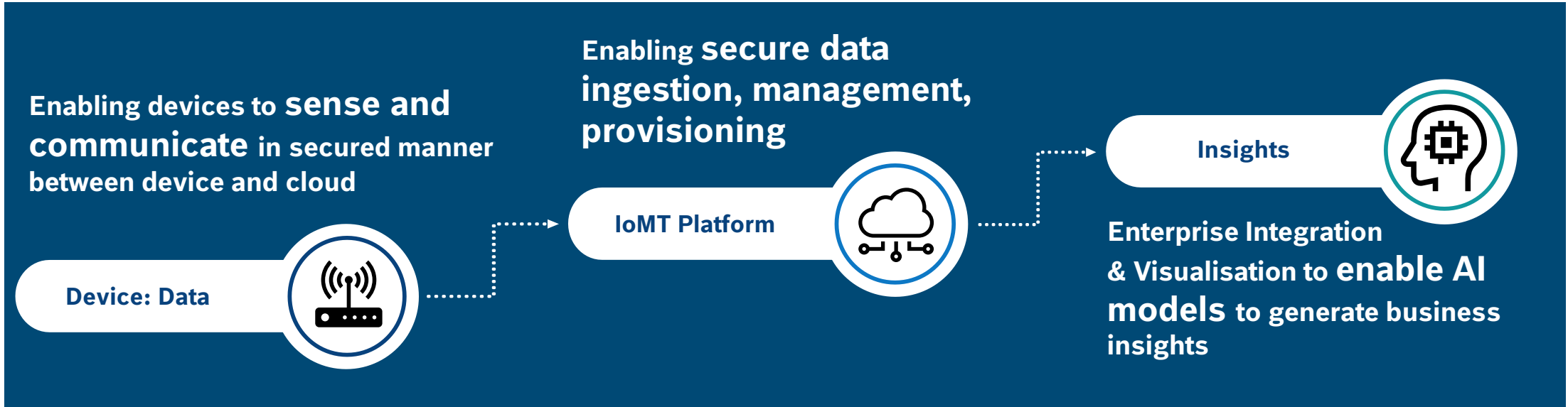
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Embedded & sensor fusion  
Internet of Medical Things  
Cloud solutions  
AI & Data Science

# Internet of Medical Things (IoMT)

## From Sensors and Data to Insights



(Medical) device & sensor information



Embedded Software and Connectivity



Data collection & ingestion



Cloud & Edge Solutions: Services and Storage



Visualization, Custom Dashboards, Websites and Apps



AI and Data Science



# The ever-growing importance of AI in Healthcare

## Quantifying the AI Revolution

AI would analyze the same number of images a radiologist will analyze over a lifetime in less than 2 hours.<sup>1</sup>

**5,000,000**

AI applications have the potential to reduce healthcare costs by 50%.<sup>2</sup>

**50%**

Average accuracy of AI systems, compared to 88.2% of human pathologists.<sup>3</sup>

**99.5%**

Potential economic value that AI could add to the pharmaceutical industry globally by 2030.<sup>4</sup>

**\$2.2 t**

AI-driven drug discoveries have been up to 100 times faster than traditional methods, allowing for quicker identification of potential candidates.<sup>5</sup>

**100x**

Estimated annual savings of the pharma industry by leveraging AI<sup>6</sup>

**\$300 bn**

# The ever-growing importance of AI in Healthcare

AI has become a very **developed technology area** in many different business domains in the last 10 years.

**Key pilot domains** are e.g. the automotive industry and consumer industry.

Healthcare & life sciences are currently **fast followers** in AI.



## Chances

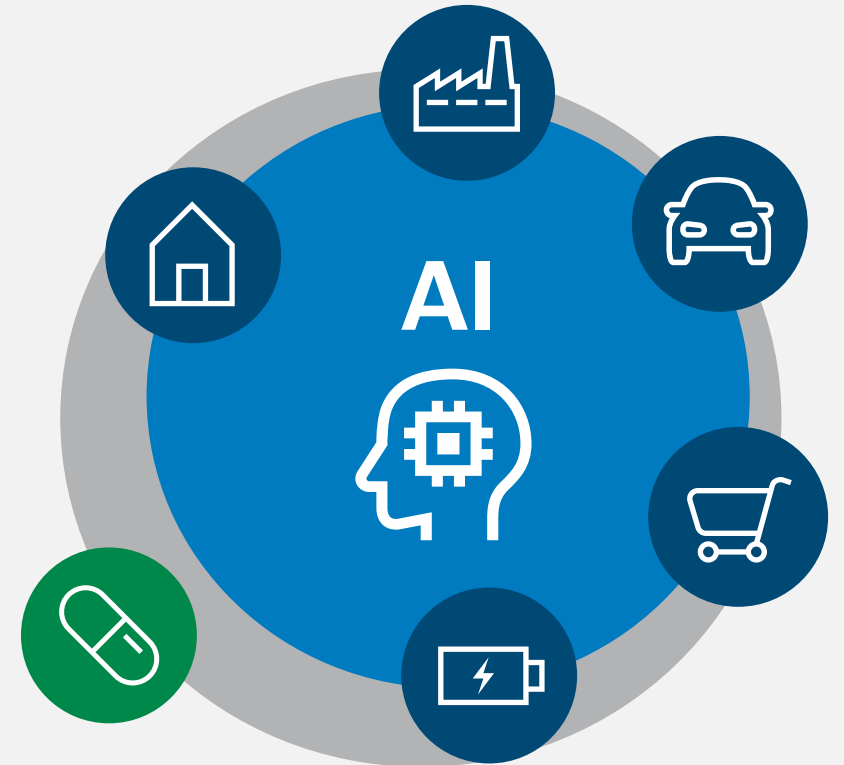
- Learn from the pioneers
- **Gain speed**
- **Reduce** learning curve and **failure** rate



## Risks

- High **speed** of **developments**
- **Multi-domain** knowledge needed

**“You don’t need to be a pioneer to succeed in AI”**



# The ever-growing importance of AI in Healthcare



Accelerated Drug  
Discovery



Faster Clinical  
Trials Dev Times  
& TTM



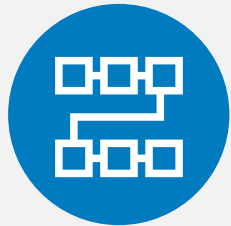
Enhanced Drug &  
Product Safety &  
Security



Optimized  
Manufacturing &  
Supply Chain



Personalized  
Medicine



Enhanced  
Features &  
Functionalities



Enhanced  
Regulatory  
Compliance



Virtual Health  
Assistants



Improved Market  
Access



Insights from  
Scientific  
Literature

# Yet the actual numbers reveal a different story

The % of healthcare organizations reporting **suboptimal integration** of AI into existing systems, indicating challenges in seamless implementation.<sup>1</sup>



**50%**

The estimated **decrease in patient trust** in healthcare institutions due to perceived overreliance on AI, highlighting the importance of transparent communication.<sup>2</sup>



**40%**

The average **delay in timelines** for implementing AI solutions in pharmaceutical R&D due to technical challenges and resistance to change.<sup>3</sup>



**5 years**

The reported **cost of failed AI-driven drug development projects**, underscoring the financial risks associated with unsuccessful implementations.<sup>4</sup>



**\$2 bn**

# What it takes to make an AI implementation successful



## Data Strategy

Outlining objectives

Data understanding

Data governance

Data quality

Data integration

Data scalability

Flexible architecture

Data latency

Cost effectiveness

Cross-functional data collaboration



## AI Strategy

Outlining objectives

Pilot programs

Scalable modules

Adaptable models to changing data

Model monitoring

Model governance

Continuous learning

Quantifiable success metrics

Cost effectiveness

Reusable ML pipelines



## Compliance Strategy

Data privacy

Data security

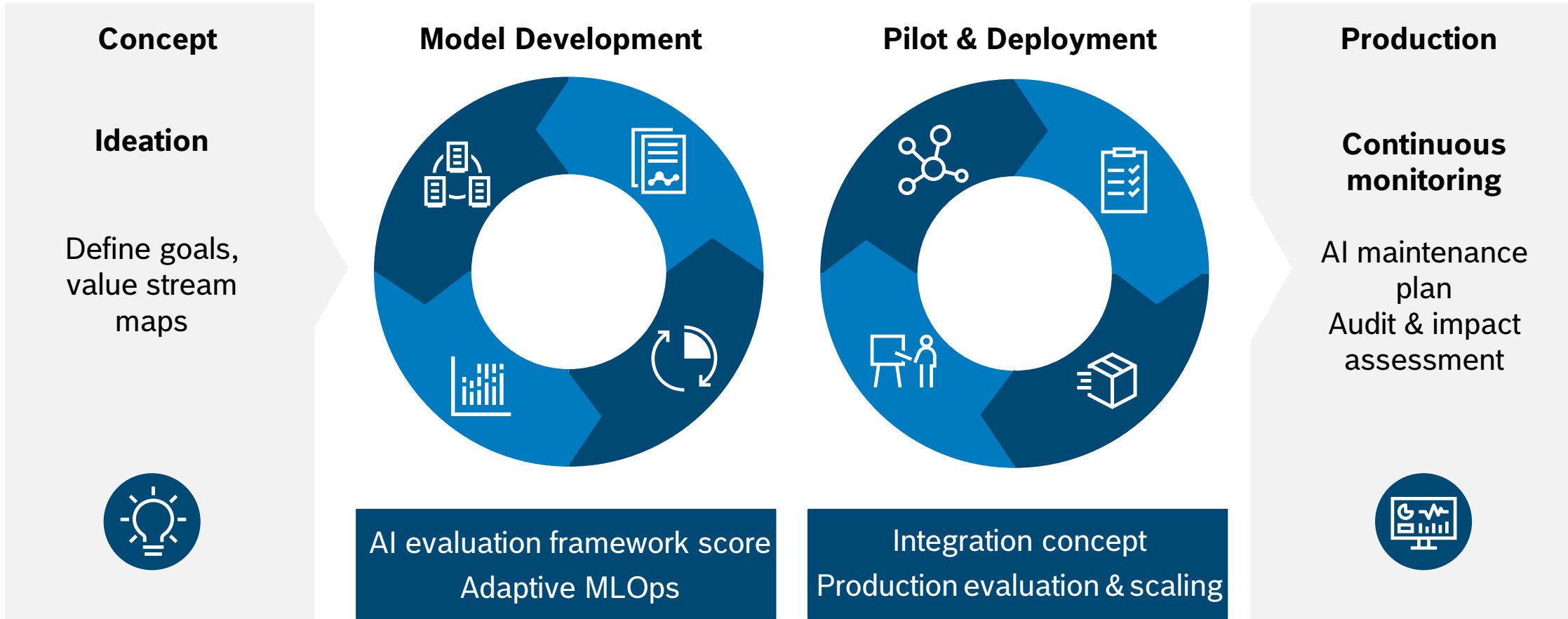
Ethical AI

Responsible AI

Fairness in AI

Explainable AI

# AI strategy – Experience-driven AI implementation



**Continuous improvement-driven AI adoption to maximize the ROI.**

# Data strategy - Treat data as a key asset



## Data Governance

Govern and manage data as a strategic asset



## Data Access

Enable efficient data access & analysis



## Data Security

Ensure robust data security & compliance



## Data Workforce

Cultivate a modern data skills workforce



## Data Collaboration

Promote collaborative data innovation

Unlocking the power of AI begins with recognizing that **data** is the **indispensable cornerstone**, the very heartbeat, that breathes life into **exceptional results**.

# Compliance



## Robustness

Computational validation  
Audits & monitoring



## Safety

Fail-safe designs  
Testing & simulation



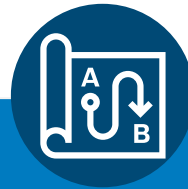
## Fairness

Bias controlled  
Legality  
Compliance



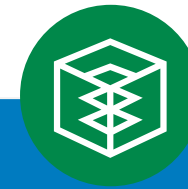
## Security & Privacy

Data governance  
Compliance



## Explainability


Communication  
Documentation  
Audit & governance



## Transparency

Organizational structure  
Audit & governance

# Bosch's Centre for Data and Applied Sciences @ BGSW

 **Bosch Centre for DataScience**

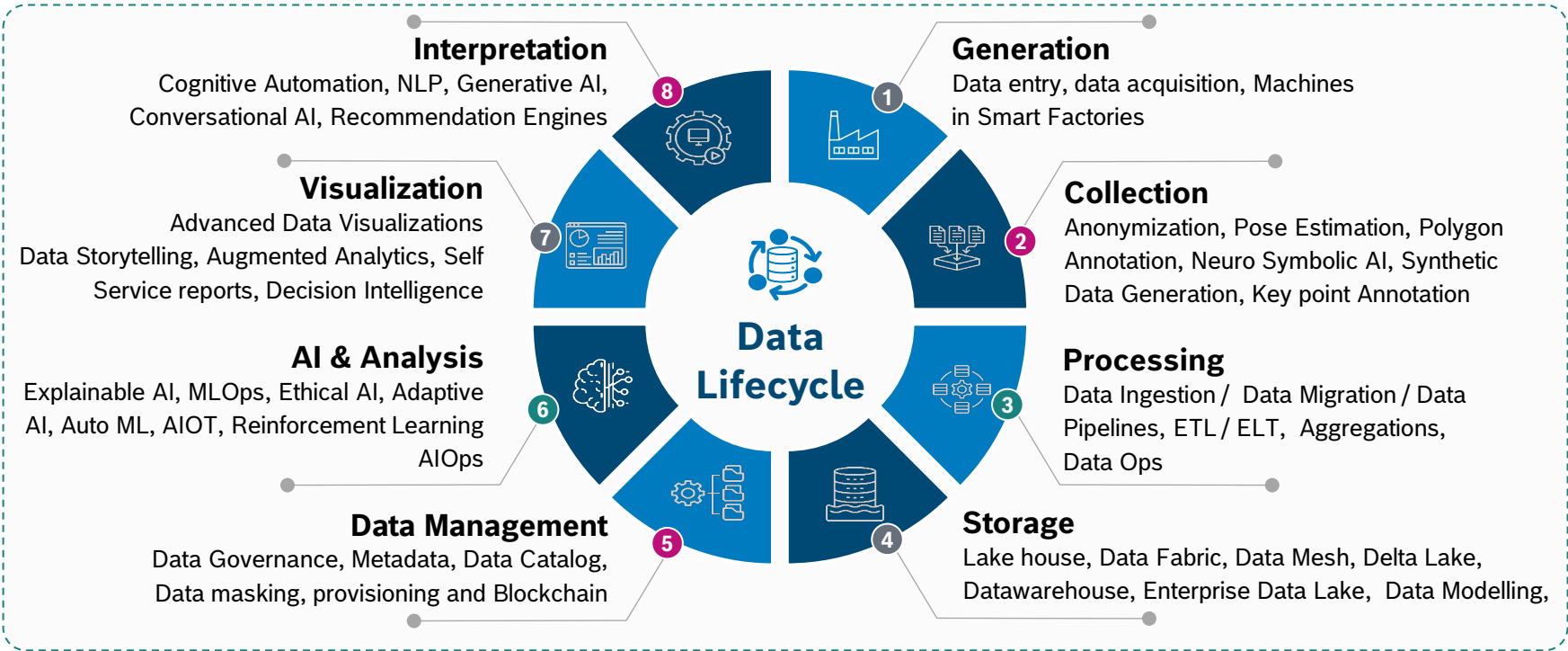
 **1200+** Professionals & Experts

 **250+** Data Transformation & AI Use cases

 **450+** Success Stories

 **550+** Certified Associates

 **30+** Invention Reports



**Partners**

**Clients**

Many Customers inside and outside of Bosch in Lifescience, Pharma, Healthcare and beyond....

# Bosch healthcare & life science expertise



## Sensor Engineering & Services

Hardware and embedded software development

Sensor fusion technologies

Software testing



## Internet of Medical Things

End-to-end IoT solution development

Cloud and data management

Integration & interoperability applications



## Data Science, Computer Vision & AI

Predictive analytics for device management

Clinical analytics

Computer vision & AI algorithm development

# Partnership & Competence

## Unlock AI's potential

Revolutionize research & supply chains through **synergistic achievements**.

Foster **internal expertise**, cultivate **industry knowledge**, and embrace **continuous learning** to drive AI advancements

## Partnerships

Choose **capable partners** that are:

- **Multi-domain & scalable** teams & highly educated & **research-driven** workforce
- **Pioneers** in AI
- **Hyperscalers** that engage with regulatory authorities

## Bosch as a Partner in AI

**Interdisciplinary** Bosch Data Science teams

1000+ Professionals

500+ Data transformation & AI use cases

Corporation **tool bench** & platform

- Bosch Automation
- Bosch Provenance
- Enterprise data lake framework



Data hub



Data-driven  
architecture



IP creation



Emerging  
market trends



AI strategy

# The Bosch way: Innovation impacts everyday actions



Bosch is driven by the motto “**Invented for life**” – ensuring highest quality products & services



Innovation at the core of Bosch culture;  
**18 patents filed everyday!**



Focus on fostering the transformational mindset - connected employees for a connected company



Bosch healthcare nurtures innovation with high quality; Bosch Vivalytic is the world’s fastest PoC<sup>1</sup> RT-PCR<sup>2</sup> test for SARS-CoV2



Technology excellence coupled with excellence in user experience is the key driver of the award-winning Bosch healthcare solutions



Connected health for a connected world: sensors to collect data, software to evaluate data, services to analyze data

# Sustainability embedded into our AI Strategy

Reduce CO<sup>2</sup> footprint of AI using **green algorithms**, selecting appropriate development methods, data centers, frameworks and file format

Enhancing transparency and responsibility by following a **compliance strategy**



By acting in an economically, environmentally, and socially responsible manner, we want to improve people's quality of life and safeguard the livelihoods of present & future generations.



“Our goal is that people should **trust our AI-based products.**”

# Contact Information

## Bosch

### Bosch Global Software Technologies

#### Key Account Management

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