



**SIEMENS**  
*Ingenuity for life*

Siemens Advanta Consulting

# Staying competitive in a highly regulated market with Continuous Delivery and DevOps

Siemens Advanta Consulting and Siemens Healthineers

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[siemens-advanta.com/consulting](https://siemens-advanta.com/consulting)

# YOUR PRESENTERS

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Dr. Peter Fassbinder  
Siemens Advanta Consulting  
Principal Expert PLM Process Innovation

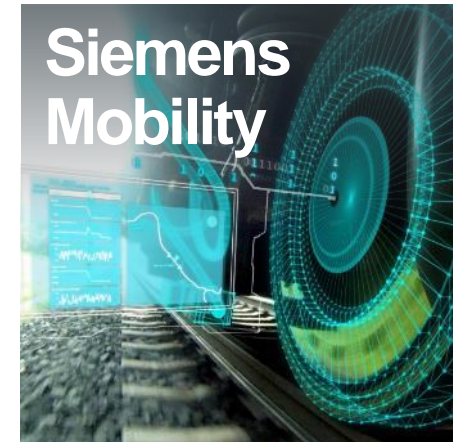
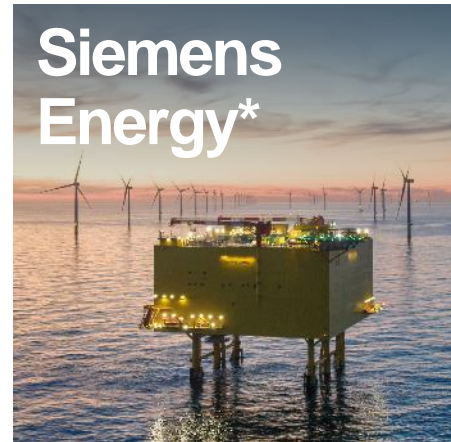


Carsten Spies  
Siemens Healthineers  
Head of R&D - teamplay

# Vision 2020+ Company setup

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## Operating Companies



## Strategic Companies

Service Companies (Financial Services, Global Business Services, Real Estate Services)

Corporate Development (e.g. Siemens Advanta, Corporate Technology, Next47, Portfolio Companies)

Governance units

\* Siemens Energy part of discontinued operations since Q2/20

Partial spin-off of Siemens Energy planned; Siemens Energy holds about 67% of the voting rights at Siemens Gamesa Renewable Energy

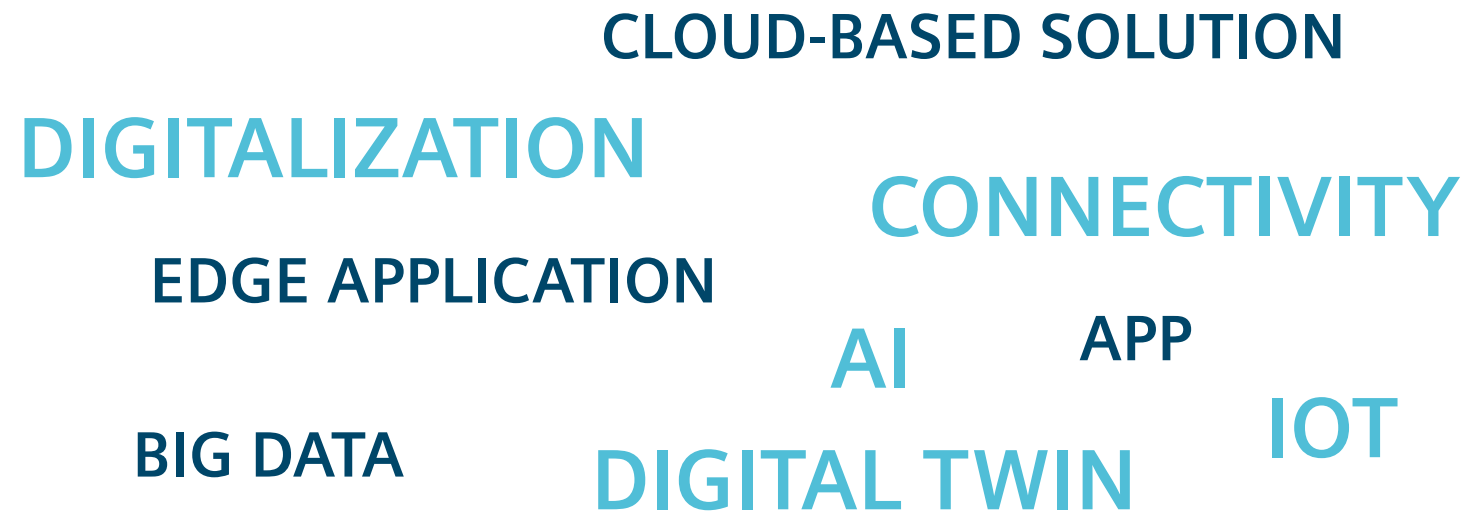
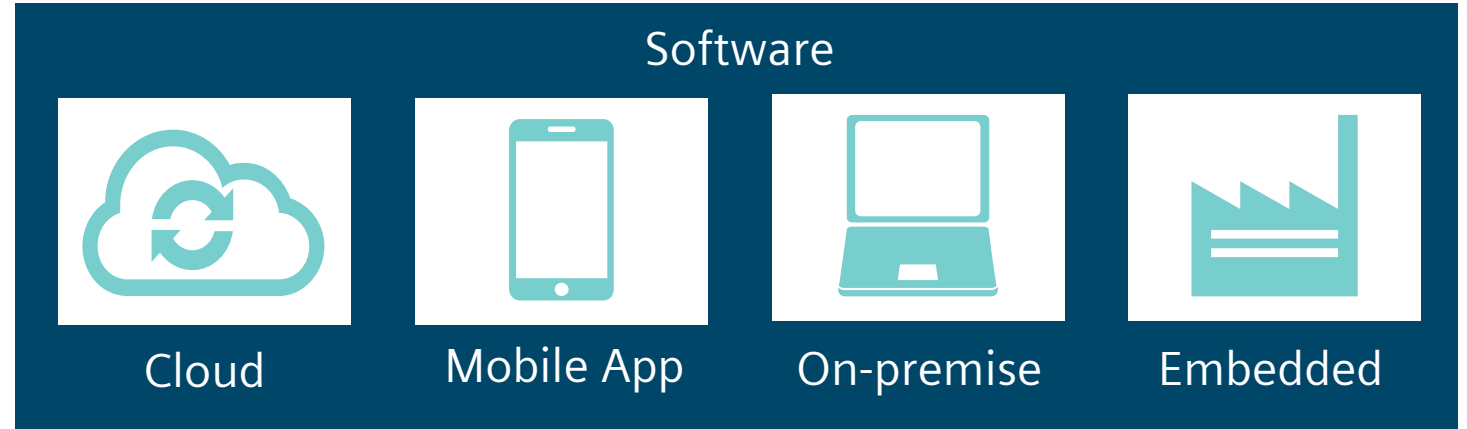


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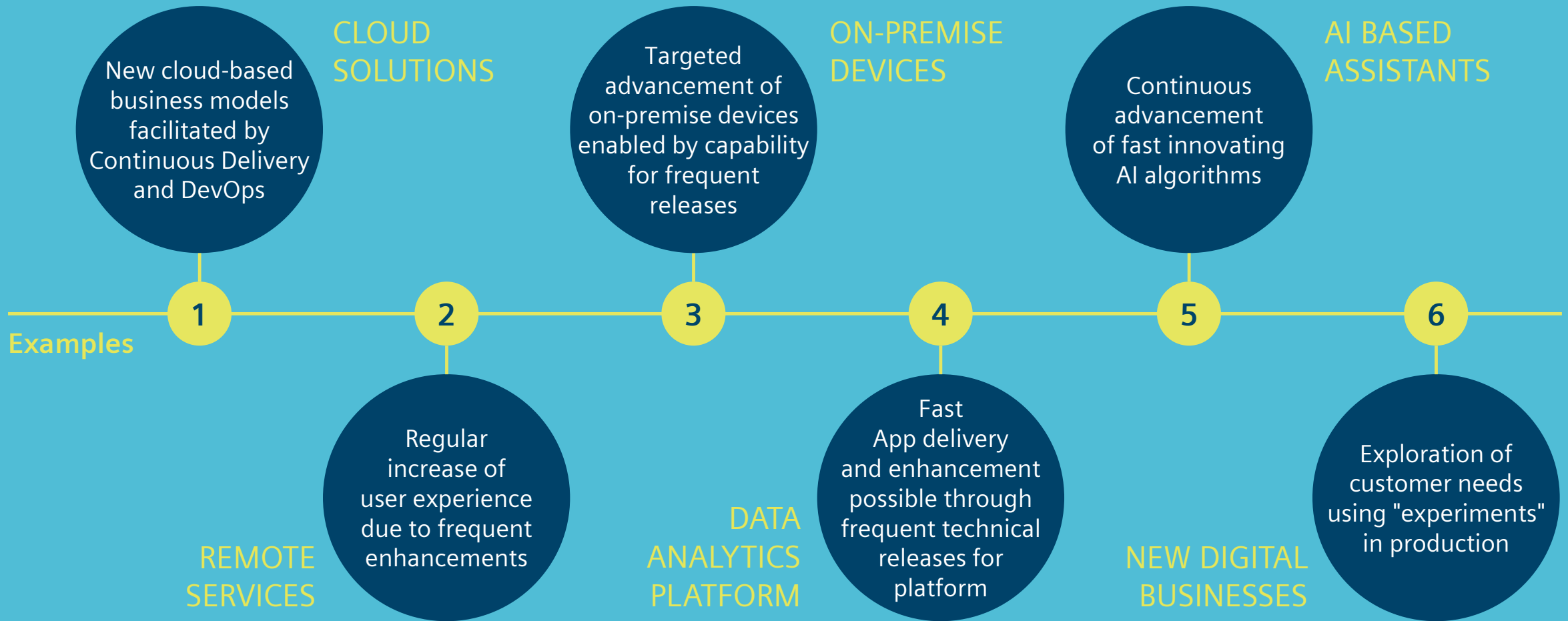
# CHANGING PRODUCT DEVELOPMENT FOR A CHANGING WORLD

# BOOST OF DIGITAL CAPABILITIES

enables new  
business scenarios  
based on continuous  
enhancements  
of solutions

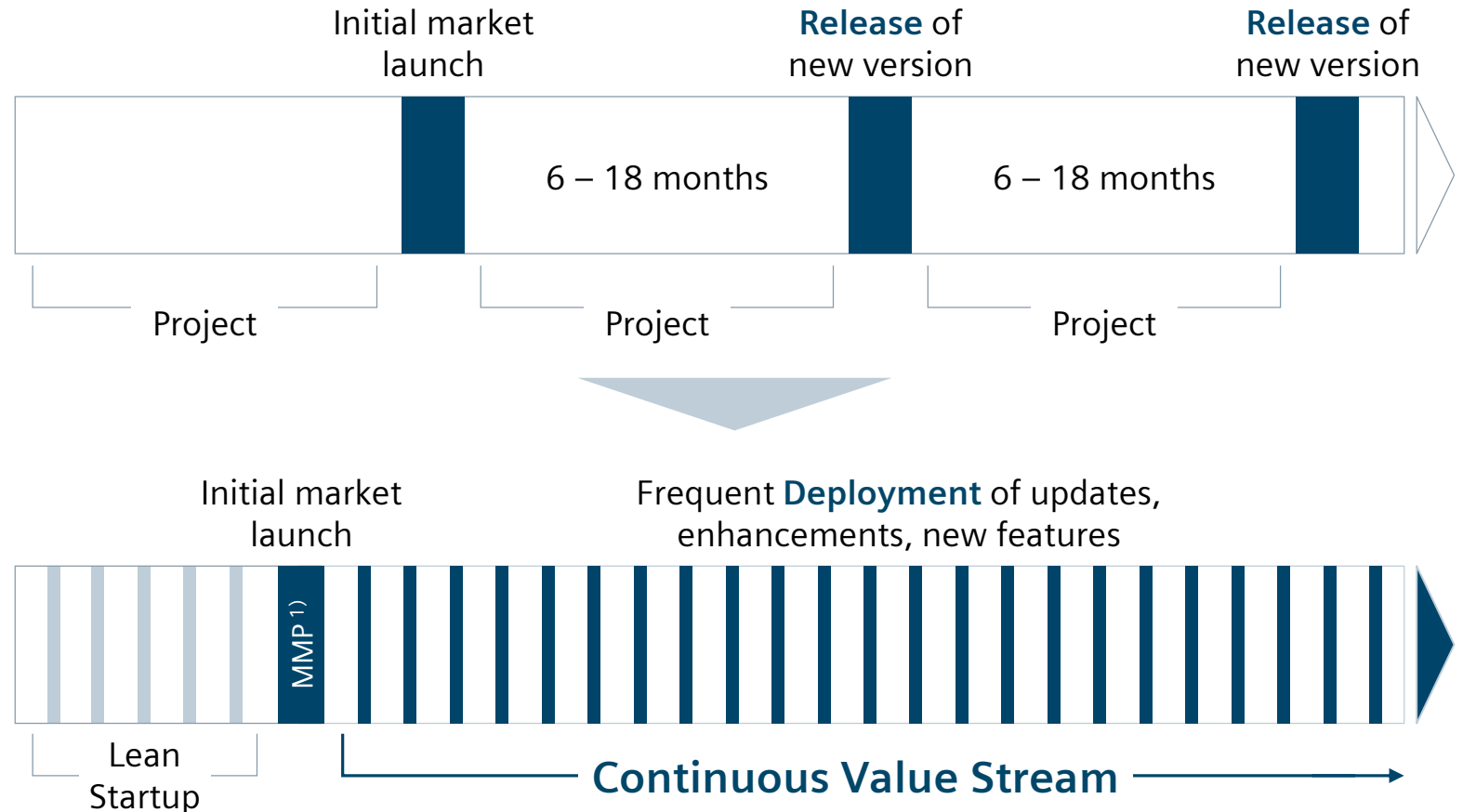


# Boost of digital capabilities and connectivity provide many application scenarios for industrial companies



Continuous Deployment implies a shift from projects with discrete releases to a

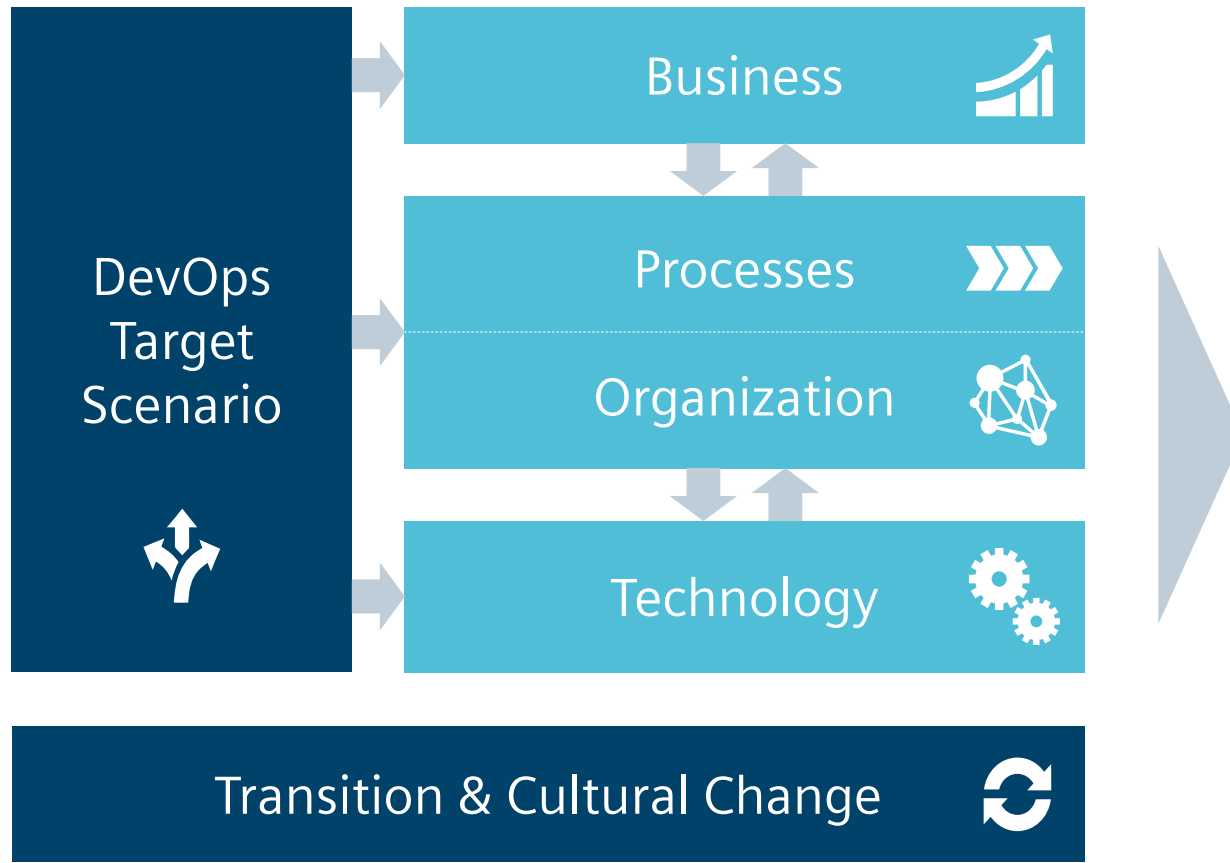
# CONTINUOUS VALUE STREAM TO CUSTOMERS



1) Minimal Marketable Product



# Establishing Continuous Delivery and DevOps requires a targeted, organizational transformation



CHANGING  
PRODUCT  
DEVELOPMENT  
FOR A  
CHANGING WORLD



# Siemens Healthineers - A long story of success



Röntgen



Von Behring

## 1901 Nobel prize winners (Physics and Medicine)



**1896**  
First industrially  
manufactured  
medical X-ray unit



**1909**  
The fastest X-ray  
device of its time



**1933**  
Our first rotating  
anode X-ray tube



**1941**  
First rapid urine test



**1953**  
First device for  
echocardiography



**1956**  
First ever dry  
chemistry testing  
for glucose in urine



**1957**  
First fully auto-  
mated discrete  
chemistry analyzer  
for whole blood  
or serum



**1958**  
First nuclear  
medicine scanner  
from Siemens



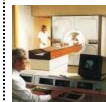
**1964**  
First glass  
electrode for  
blood-gas analysis



**1967**  
World's first real-  
time ultrasound  
scanner



**1975**  
Our first  
CT scanner



**1983**  
First Siemens  
MRI scanner



**1990**  
World's first  
spiral CT scanner



**1996**  
The best-selling  
ultrasound system  
of all time



**1997**  
First in-vitro whole-  
blood detector of  
platelet-function  
abnormalities



**1998**  
Our first track-  
based laboratory  
automation system



**1999**  
First intuitive medical  
IT platform  
from Siemens



**2001**  
Our first PET/  
CT system



**2005**  
World's first Dual  
Source CT scanner



**2006**  
Diagnostic analyzer  
integrating four  
technologies in  
one system



**2008**  
Robotic-assisted  
angiography  
system



**2008**  
Digital radio-  
graphy, wireless  
flat panel detector



**2009**  
Multi-modality 3D  
imaging software



**2011**  
First integrated,  
simultaneous whole-  
body MRI and PET



**2012**  
Wireless  
transducers  
for ultrasound



**2014**  
"Free breathing"  
CT scanning with  
dual X-ray sources  
and detectors



**2014**  
Cloud-based  
network: teamplay



**2015**  
Wide-angle image  
acquisition breast  
tomosynthesis



**2015**  
The first research  
7T MRI:  
MAGNETOM 7T



**2015**  
First Twin Robotic  
X-ray for better  
patient care and  
productivity



**2015**  
First BTP assay to  
determine RRF  
and CSF leakage



**2016**  
Liquid biopsy



**2016**  
Cinematic  
rendering for 3D  
medical imaging



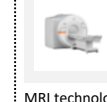
**2017**  
Lab diagnostics  
solution for  
immunoassay  
and clinical  
chemistry:  
Atellica® Solution



**2017**  
A whole new  
world of precision:  
Biograph Vision



**2017**  
Mobile operations  
for closer patient  
interaction: SOM-  
ATOM go.platform



**2017**  
MRI technology  
adapting to human  
nature: BioMatrix



**2017**  
FAST 3D Camera –  
automated precise  
patient positioning



**2018**  
More than 40 AI-  
enriched offerings



**2018**  
AI-Rad Companion  
Chest CT to mark  
and measure  
potential  
abnormalities



**2018**  
Software for remote  
scanning assistance:  
syngo Virtual Cockpit



**2018**  
Innovision:  
Planned  
to redefine the  
MRI experience<sup>1</sup>



**2019**  
AI-enabled user  
guidance system:  
myExam Companion



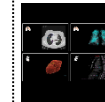
**2019**  
MR Fingerprinting<sup>2</sup>:  
Leverage quantitative  
data to understand  
more precisely a  
patient's condition



**2019**  
ARTIS icono - enables  
a wide procedure mix  
and multi-disciplinary  
usage



**2019**  
CT imaging of the  
head at the point of  
care: SOMATOM  
On.site<sup>3</sup>



**2019**  
Multi-modality  
imaging decision  
support<sup>4</sup> with AI-Rad  
Companion



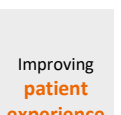
**2019**  
AIDAN<sup>5</sup> Artificial  
Intelligence for  
Molecular Imaging



Expanding  
precision  
medicine



Transforming  
care  
delivery



Improving  
patient  
experience



Digitalizing  
healthcare

Future

The products/features (mentioned herein) are not commercially available in all countries. Due to regulatory reasons, their future availability cannot be guaranteed. Please contact your local Siemens Healthineers organization for further details. | <sup>1</sup> Innovision is still under development and not commercially available yet. It is not for sale in the US. Its future availability cannot be ensured. | <sup>2</sup> Magnetic Resonance Fingerprinting is 510(k) pending. It is not commercially available in all countries. Due to regulatory reasons the future availability cannot be guaranteed. | <sup>3</sup> SOMATOM On.site is pending 510(k) clearance, and is not yet commercially available in the United States or other countries. | <sup>4</sup> AI-Rad Companion Chest CT (MSK) is pending 510(k) clearance, and is not yet commercially available in the United States. Its future availability cannot be guaranteed. | <sup>5</sup> AIDAN The features herein are pending 510(k) clearance, and are not yet commercially available in the United States or other countries worldwide on Biograph Horizon, Biograph mCT and Biograph Vision. Their future availability cannot be guaranteed. The features here do not yet fulfill all the essential requirements according to the European Medical Device Directive (93/42/EEC) and its national implementations for Biograph mCT and Biograph Vision. They are not yet commercially available in the EU. Future availability cannot be guaranteed. Please contact your local Siemens Healthineers organization for further details.

# Who we are

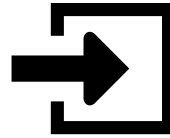


1) Revenue FY 2019

2) AdvaMedDX, "A Policy Primer on Diagnostics", June 2011, p. 3

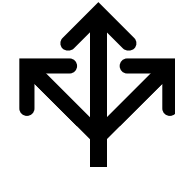
# What is the teamplay digital health platform?

The teamplay digital health platform is **the enabler of your digital transformation** by facilitating easy access to operational, clinical and shared decision support solutions combining accessibility, flexibility, scalability and connectedness for your future readiness.



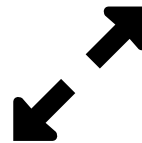
## Accessible

Easy access to a broad selection of decision support software and innovations in AI



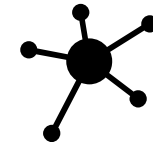
## Flexible

Tackle the increasing speed in digital transformation and save time while entering new markets



## Scalable

Solutions for different levels of digital maturity that grow with your needs



## Connected

Platform-enabled interoperability offers seamless access to digital health solutions

# Digital Health Solutions – Supporting operational, clinical, and shared decision-making along the patient pathway



## Streamlining operations management

Service line management solutions

teamplay performance management applications  
(teamplay Dose, Usage, Protocols, Images, Insights)

Medicalis Workflow Orchestrator

Medicalis Referral Management

BEFUND24



## Supporting diagnostic and therapeutic decision-making

Clinical decision support solutions

AI-Rad Companion

AI-Pathway Companion

Medicalis Clinical Decision Support



## Connecting care teams and patients

Patient management solutions

teamplay myCare Companion

eHealth Solutions



## Your entry point to digital offerings

Digital Marketplace solutions

Siemens Healthineers and partner solutions



## teamplay digital health platform

Enabling healthcare providers a quick start into digitalization

Healthcare provider IT

DICOM | HL7 | FHIR

RIS

PACS

VNA

HIS/EMR

LIS

CVIS

OIS

...



# Product innovation goes hand in hand with innovating the way we develop, deliver and operate products

## Traditional business model

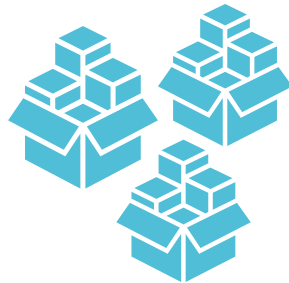
- hardware products and traditional software solutions
- customer-individual on-site installation and operation
- software updates are handled as IT-projects
- rather long product release cycle time (up to >1 year)



## Additional new business models

- subscription based service (e.g. pay-per-use)
- centrally operated & globally available software solutions
- immediate access to latest software by automatic updates
- rapid innovation with fast customer feedback cycles

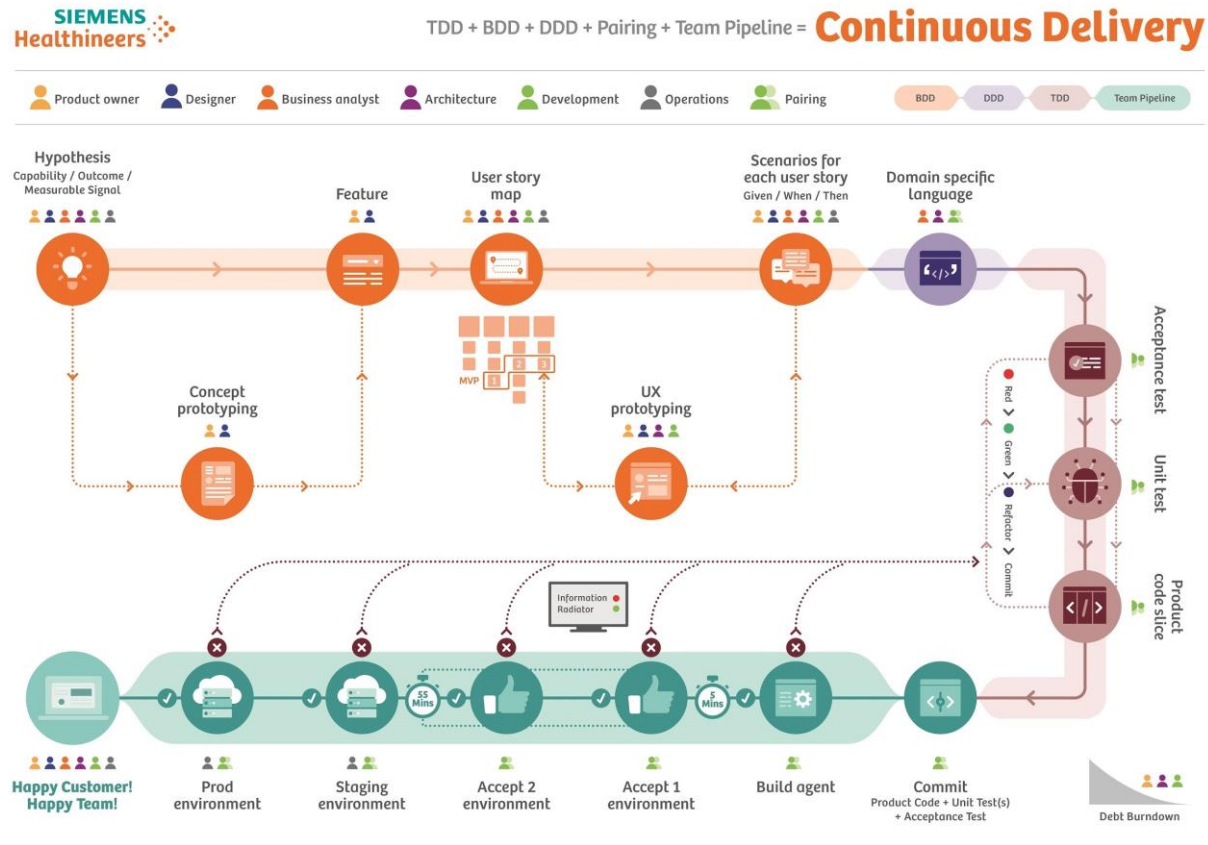
*From "shipping boxes" ...*



*... to additionally "operating global solutions for customers"*



# From Continuous Delivery to Continuous Compliance ...



- Our teams own CD pipelines from their developer machines all the way to production
- CD pipelines include generation of documentation artefacts required by our PLM process to comply with medical device regulations

Source: „Adopting Continuous Delivery at teamplay, Siemens Healthineers”  
David Farley & Vlad Ukis, Sep 04, 2018  
[https://www.infoq.com/articles/continuous-delivery-teamplay/?itm\\_source=infoq&itm\\_campaign=user\\_page&itm\\_medium=link](https://www.infoq.com/articles/continuous-delivery-teamplay/?itm_source=infoq&itm_campaign=user_page&itm_medium=link)

# What if customers could use smart data to reduce radiation dose & increase patient throughput?

## teamplay & Computed Tomography



### IATROPOLIS Athens, Greece

“The 10% increase of our efficiency gave us a revenue that we could reinvest in buying new machinery and having a *better quality to service or patients*.”<sup>1)</sup>

Gourlis Sokratis, Member of Board, IATROPOLIS Athens, Greece

## Challenge



Improve quality of care

**Deliver better and more personalized patient care**



Increase Efficiency

**Increase efficiency through workflow optimization**



Reduce risk & act compliantly

**Comply with changing European Union regulations**

## Healthcare engineering

- User-oriented dashboard to monitor KPIs in near real-time<sup>2)</sup>, enabling operational insights to e.g. match staffing schedules with demand
- Automated dose protocol management for immediate and reliable monitoring while considering legal requirements, e.g. Euratom

## Value contribution

**10 – 15%**

**Reduction of average patient radiation dose within 3 months**

**10%**

**Increase of patients since introduction of teamwork (up to 2,550 per day in total)**



**teamplay CORE App Dose helps you be compliant with EU EURATOM regulations**

1) The results by Siemens' customers described herein are based on results that were achieved in the customer's unique setting. Since there is no "typical" hospital and many variables exist (e.g. hospital size, case mix, level of IT adoption) there can be no guarantee that other customers will achieve the same results.

2) Prerequisites include: wireless connection to clinical network, meeting recommended minimum hardware requirements, and adherence to local data security regulations.

# INTERNAL NETWORKS DRIVEN BY KEY EXPERTS

speed up this radical  
paradigm shift and  
make it a success across  
the different businesses  
of the company





# WHAT WE WANT FROM YOU

Let's talk about DevOps in regulated industries

- Country Specific Regulations
- Approval Processes
- Continuous Compliance
- Adequate Tooling



# YOUR CONTACTS

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