Digitizing healthcare
Digital Innovation Forum 2017

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Digitization is transforming every industry
The digital revolution: how photography evolved

Mechanization → Digitization → Integration

An ecosystem of digital propositions
The pathway of the digital revolution
Disrupting industries and society

Multiple function integration
Single function integration

Analog
Digital
System

System of systems

Integrated solutions (ecosystem of digital propositions)
Early developments in Patient Monitoring

Sanborn – First portable ECG Machine, 1928

First Patient Monitor ‘Viso-Scope’, 1957

Cardiotachometer

Blood Pressure Monitor

Body Temp and Respiration Rate
Patient Monitoring in the ICU today

Digital monitoring platform: all basis measurements plug and play
Decision support and analytics in the cloud

CDS

- Acute respiratory distress syndrome
- Acute kidney injury
- Clinical information extraction
- Acute respiratory failure
- Decision for non-invasive ventilation
- IntelliSpace console critical care
- Patient deterioration
- Patient acuity
- Multi-organ failure
- Decision for emergency care
- Critical care forecasting
- Hemodynamic instability
- Patient deterioration at home

Healthy living | ER | OR | ICU | Ward | Telehealth | Home
Global healthcare challenges

- Growing and aging population
- Rising chronic diseases
- Spiraling costs
- Too little access
- Too little capacity

Innovation for personalized health, better outcomes, higher efficiency
Consumers increasingly engaged in their own health

Shift to value-based healthcare will reduce waste, increase access and improve outcomes

Care shifting to lower cost settings and becoming networked

Digital Solutions will enable industrialization and personalization of care
Digital technologies enable precision medicine

Wide (longitudinal) data
Continuous monitoring over time

Deep data
From anatomy to cells and molecules

Dense data
Pattern recognition in aggregated data sets – across a population
Intelligence in the cloud – for care everywhere
HealthSuite digital platform powers connectivity across the health continuum

An open, cloud-based platform of services, capabilities and tools that allows Philips and our partners to create the next generation of connected health and wellness innovations.
Understanding cardiology challenges

We want to prevent consumers from experiencing acute incidents and keep them out of the professional care space and in lower cost settings as much as possible.

The cardiology care continuum is complex due to multiple conditions and co-morbidities such as COPD, diabetes and hypertension.

Cardiology requires innovative solutions built around patients.

Cardiologists need new, patient-centric solutions that integrate across clinical disciplines to increase operational and clinical efficiency while lowering costs.
Philips Cardiology
Every heart is unique
Philips Heart Health program potentially reduces the risk of heart disease

Moving care outside the hospital and into our homes and everyday lives

Personalized health improvement plan encourages small and sustainable lifestyle changes

Wearable devices track activity and health stats and connect to a mobile app with data analytics and engaging content that promotes healthier choices

>500,000 users in a highly scalable program**

>9 month average active engagement in program**

+30 min/day activity improvement* and weight decrease***

*Under development and not available for sale in the US, ** DirectLife and ActiveLink programs, *** Wijsman et al JMIIR 2013
Anatomical Intelligence for easier and better diagnosis

Real-time 3D ultrasound

Improving accuracy and reproducibility of diagnostic measurements

Improving patient experience by reducing time of procedure, time to report and time to diagnosis

Improving communication between cardiologists and referring physicians and patient to deliver the best possible outcome
Care pathway innovation: reducing ‘door-to-balloon’ time

Redesigning the end-to-end care pathway, striving to treat myocardial infarction patients within 90 minutes of dialing the emergency services.

Requires the seamless collaboration of the emergency response services and the hospital.
IGT-wide core hardware/software integration

Angio Fractional Flow Reserve (FFR)

Multi-modality Control Screen

PCI Express

Ultrasound-based needle tracking

Fiber Optic Shape Sensing

Pressure sensing guide wire

Easy Connect

Interventional timeline

Lab integration: control screen, 2D ultrasound, continuous monitoring & hemodynamics

Healthy living

Prevention

Diagnosis

Treatment

Home care
Transforming the clinical workflow in the General Ward

Applying Philips’ automated Early Warning System along with Clinical Workflow Transformation helps caregivers catch patient deterioration early so they can intervene and avoid Sudden Adverse Events

When General Ward patients are cared for in this way, hospitals see reduced ICU transfers and better patient outcomes

Wearable biosensors: the next generation of patient monitoring

- **24% reduction** in SAE and better patient safety*
- **86% reduction** in Cardiac Arrest*
- **8% reduction** in Mortality*

*Study with Bangor University, UK
Philips partnered with Banner Health to reduce hospital readmission rates

We identified the top 5% of most expensive patients, analyzed workflows to uncover ways to improve care coordination, and designed tools and patient engagement programs to deliver continuous, comprehensive and proactive services to this population.

<table>
<thead>
<tr>
<th>Metric</th>
<th>Improvement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Care costs*</td>
<td>-34%</td>
</tr>
<tr>
<td>Re-admissions*</td>
<td>-75%</td>
</tr>
<tr>
<td>Length of stay*</td>
<td>-50%</td>
</tr>
<tr>
<td>Hospitalizations*</td>
<td>-49%</td>
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*Study of intensive ambulatory program impact on both financial and clinical outcomes in Banner Health.
The future of innovation is collaboration: in ecosystems and on open platforms
In this environment, for Europe it is imperative to:

- Drive the digital transformation – a matter of survival for European industry, and the motor behind solutions for our grand societal challenges

- Invest in collaborative R&D projects where it matters most: software and intelligent embedded systems

- Deepen co-creation within the ecosystem of large industry, SMEs, academia, healthcare institutions and payers – with appropriate PPP budgets at an EU and national level

- Facilitate digital platform adoption

- Invest in talent for digital