



BigMedilytics

Big Data for Medical Analytics

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Four profound trends are shaping the future of health technology



Global resource constraints

Healthcare sector: 10% of EU's GDP
EU-28's total healthcare spending: €1.39 trillion

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Aging populations and the rise of chronic illnesses

In 2060 Healthcare sector: 30% of EU's GDP
Chronic diseases result in loss of 3.4million potential productive years; equivalent to €115 billion annually

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Effectiveness of healthcare system:

Quality: Determined by efficacy, value and efficiency

Access: Those who can receive care when needed

Cost: Actual expense of patient care

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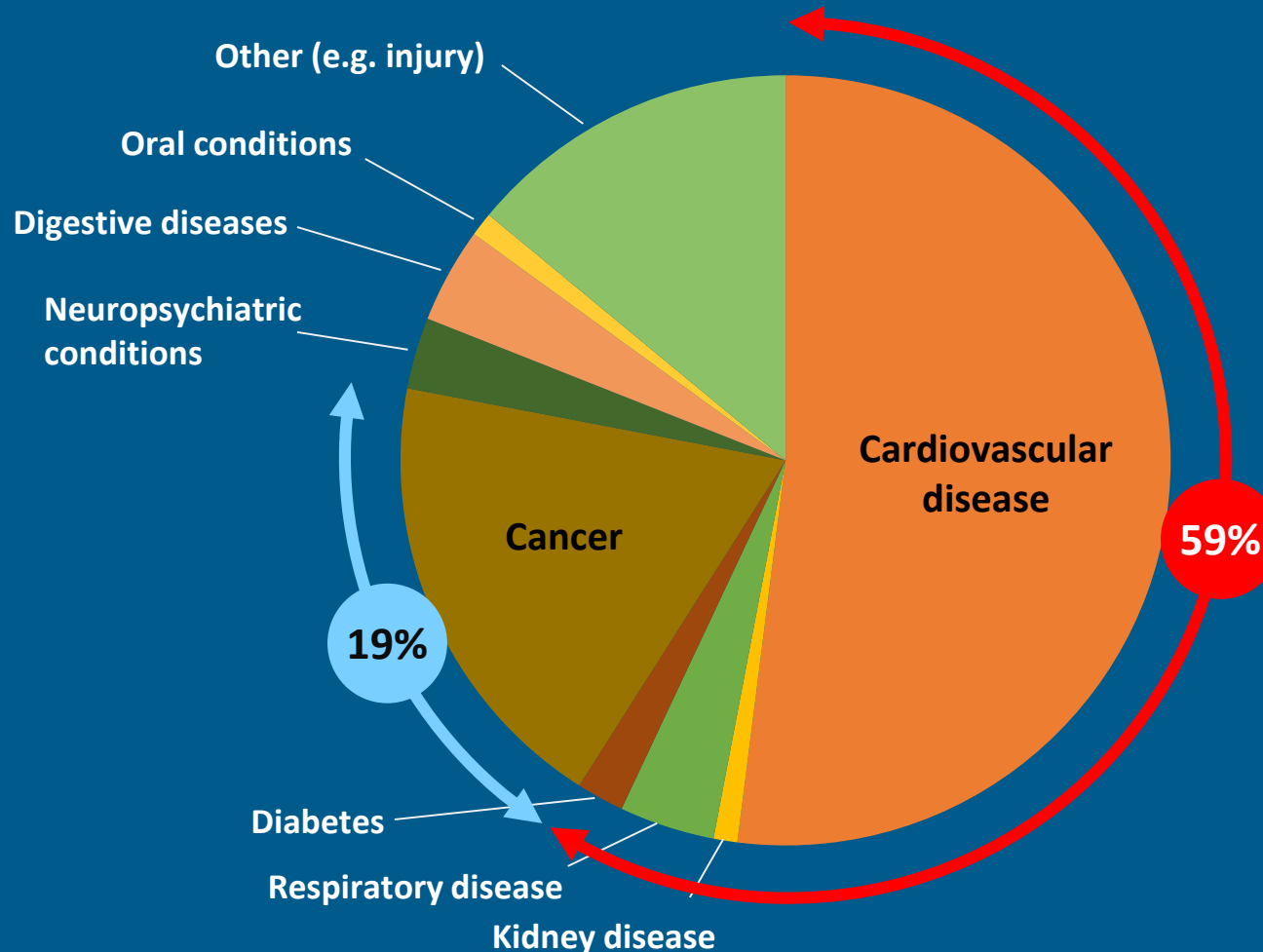
Digitization

Extract knowledge from already existing large amounts of generated medical data
Big Data: Medical data currently estimated around 1 Zettabyte (152 Million years, UHD, 8K video)



BigMedilytics aims to use state-of-the-art Big Data technologies in order to improve the productivity of the Healthcare sector, by reducing cost to the patient, improving quality through better patient outcomes and delivering better access – *simultaneously.*

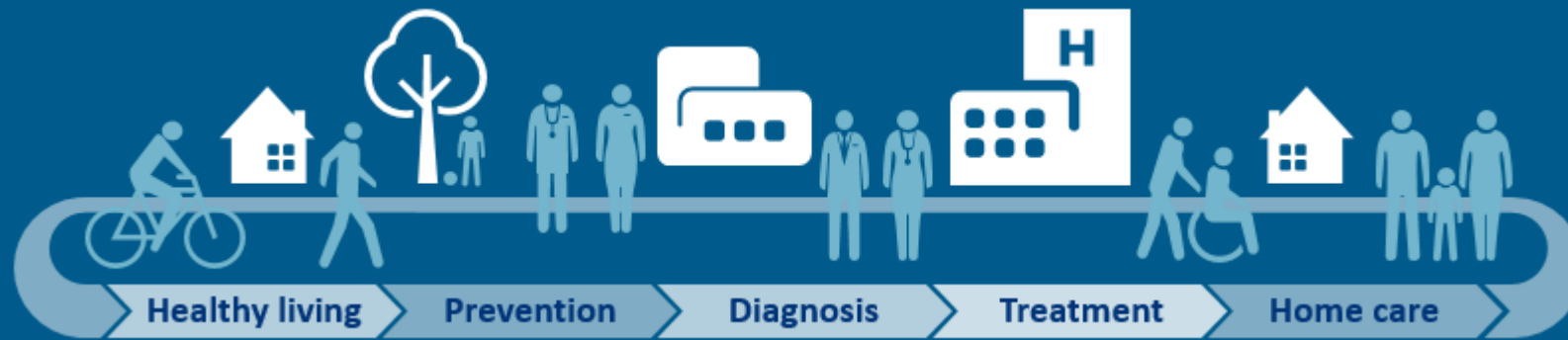
Percentage of deaths from non-communicable diseases in Europe



BigMedilytics covers *all* the major disease groups in Europe which cause 78% of the deaths:

- Cardiovascular disease
- Cancer
 - Breast cancer
 - Lung cancer
 - Prostate cancer
- Chronic respiratory disease
- Diabetes
- Kidney disease
- Comorbidities

Healthcare continuum



● — THEME 1: Population Health & Chronic Disease Management — ●

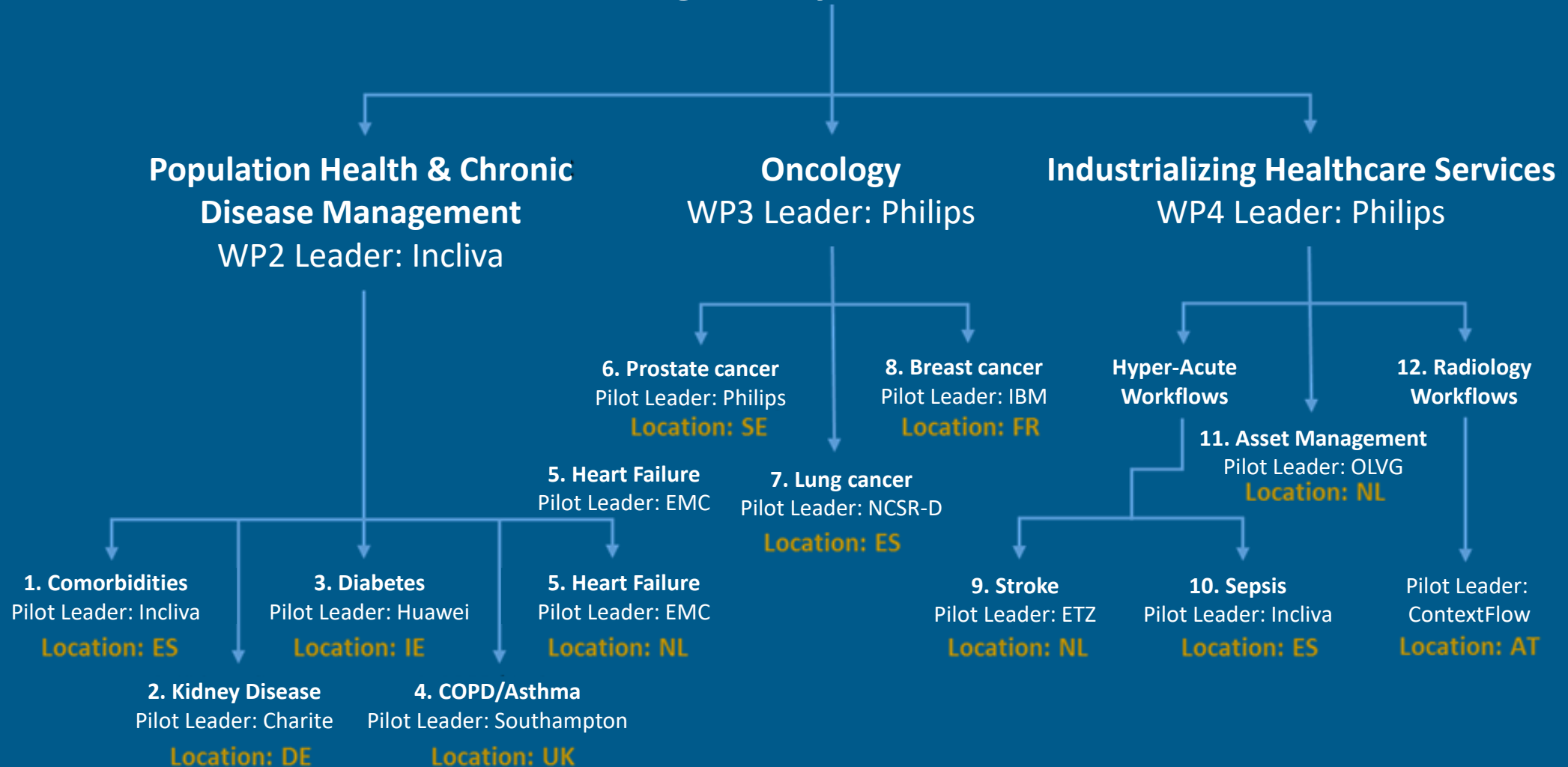
● ————— THEME 2: Oncology ————— ●

● ————— ●
THEME 3: Industrialization of healthcare

BigMedilytics

12 pilots across 3 themes

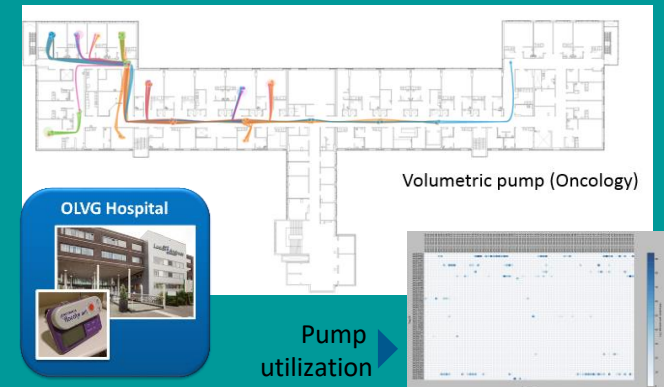
BigMedilytics Pilots



From Asset Management to Workflow Optimization

Operational decision support
Actionable visual information
Prioritize in real-time

Movement of volumetric pumps,
24 hours, 6th floor @ OLVG



Characteristics of datasets

Health records of more than
11 million patients across
8 countries in Europe

- Clinical data
- Medical images
- Laboratory data
- Prescription data
- Claims data

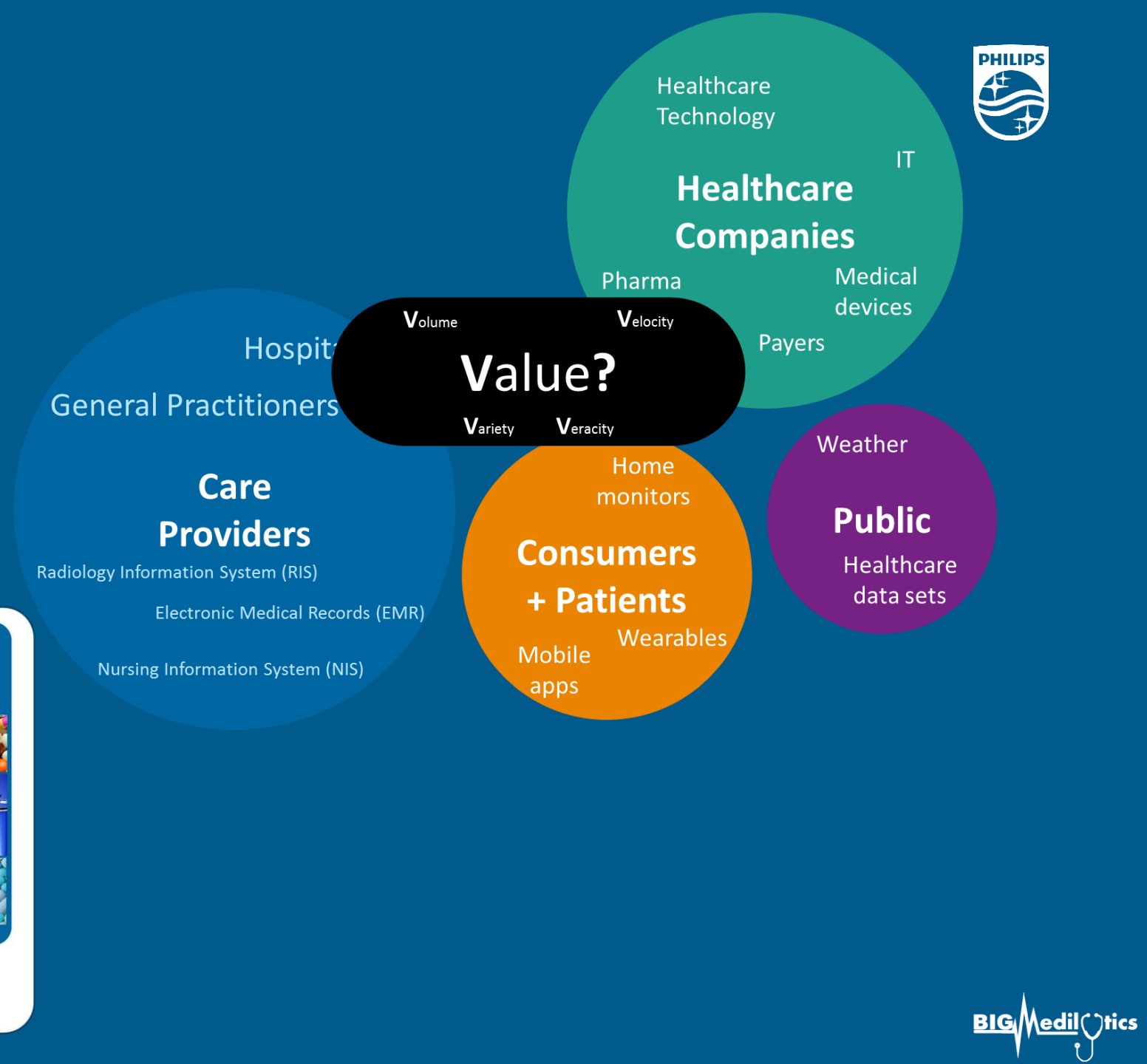
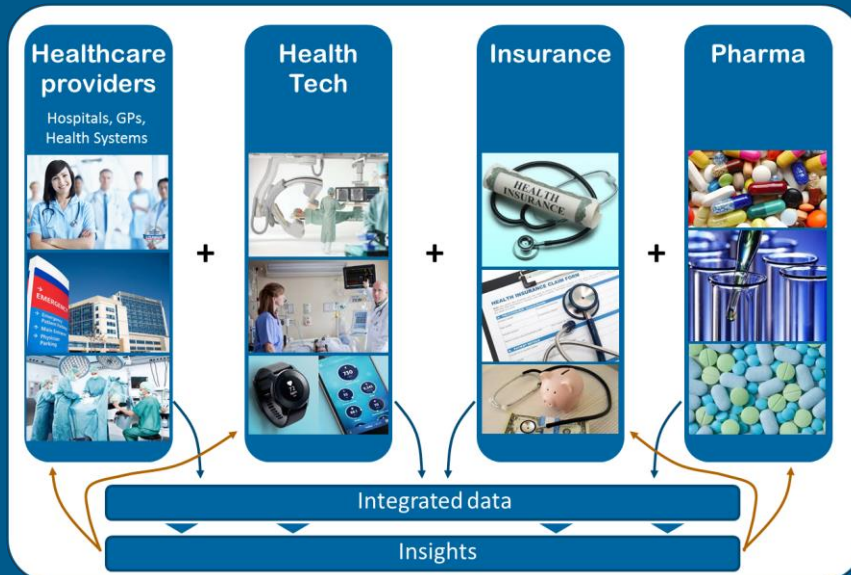
Streaming data from IoT
connected devices at more
than a million records per
hour

Patient generated data from
mobile apps

Data & AI Challenges

Data Challenges:

- Interoperability
- Methods and ecosystems for data sharing
- Missing and noisy data
- Data volume

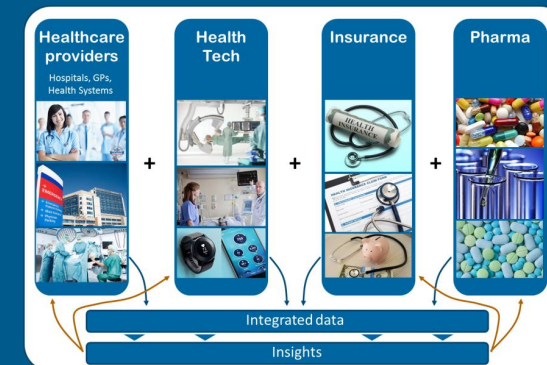
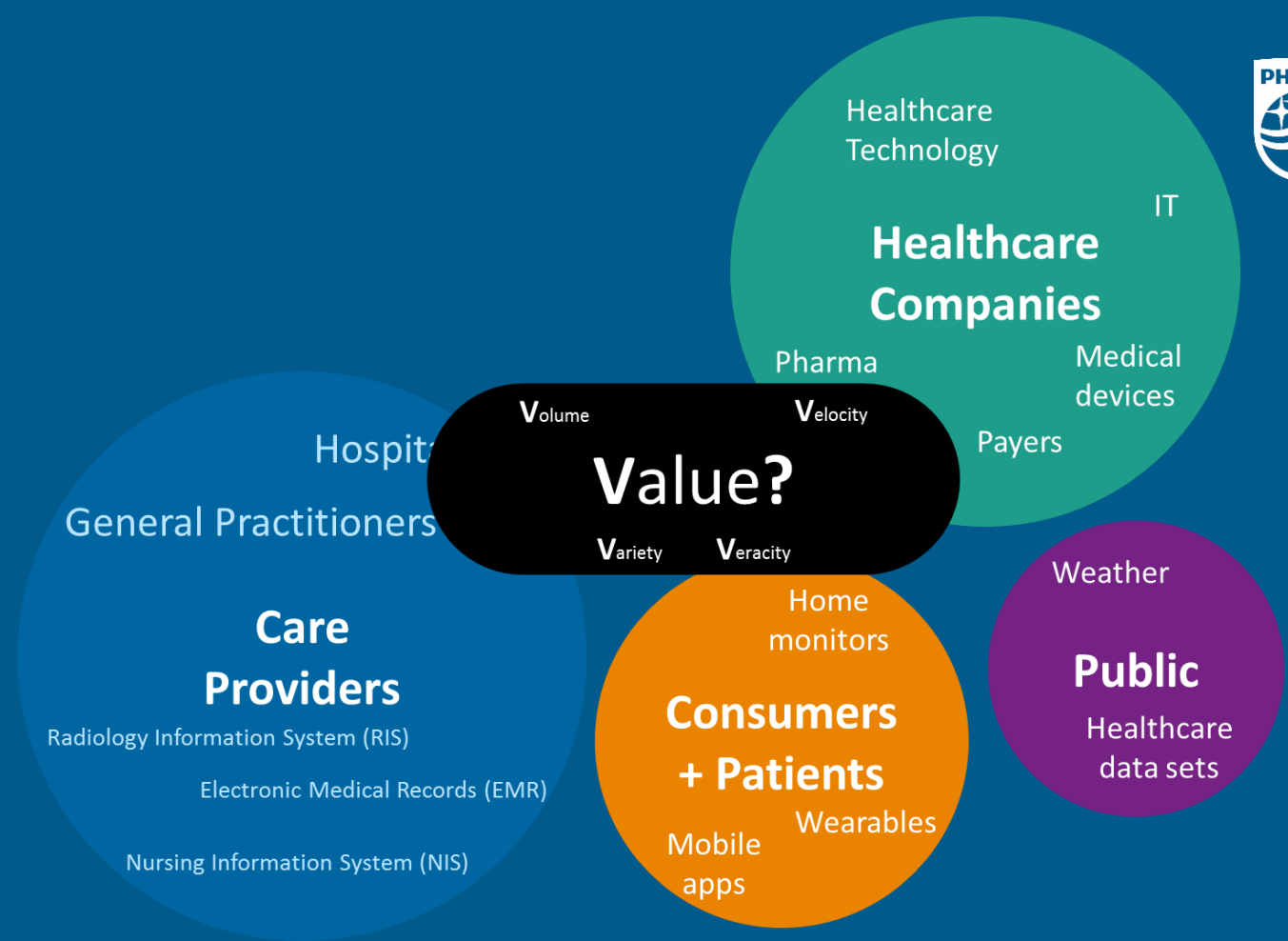


Data & AI Challenges



AI Challenges (6R model):

- **Relevant Clinical Question First**
- **Right Data (representative and of a good quality).**
- **Ratio between number of patients and their variables should fit the AI method.**
- **Relationship between data and ground truth should be as direct as possible.**
- **Regulatory ready; enabling validation.**
- **Right AI Method.**



TU/e

