CASE TITLE: HealthSuite

Module: Software Architecture, academic year 2021|22
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Background Philips

Royal Philips is a leading health technology company focused on improving people's health and well-being, and enabling better outcomes across the health continuum – from healthy living and prevention to diagnosis, treatment and home care.

Philips leverages advanced technology and deep clinical and consumer insights to deliver integrated solutions. Headquartered in the Netherlands, the company is a leader in diagnostic imaging, image-guided therapy, patient monitoring and health informatics, as well as in consumer health and home care.

HealthSuite System of Engagement

The HealthSuite System of Engagement (or HealthSuite for short) is an integrated, modular set of standards-based capabilities that support the development of digital health propositions that facilitate users' seamless interaction with the data in the Systems of Record.

In contrast to many 'systems of record', which are typically based on static, siloed files of patient information, HealthSuite enables patients and all the staff they interact with, to better manage the care experience and pathways. By taking a federated approach to data integration, HealthSuite supports healthcare providers in capturing the value of data from across their existing IT infrastructure, reducing complexity for healthcare professionals and discovering new opportunities for care innovation.

HealthSuite provides capabilities for IoT (Internet of Things), Identity and Access Management and GDPR-compliant Data Management. Its deployment models include hosting and operating health applications in the cloud, on edge and on-premise.

Challenges

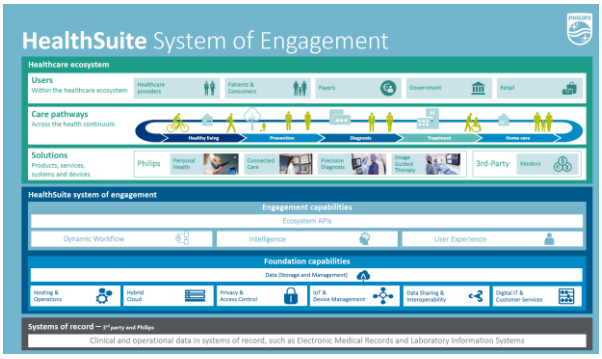
Hospitals increasingly want to leverage HealthSuite for clinical and operational data to be federated and shared across devices and solutions from Philips and third parties within the healthcare enterprise in order to create new insights, often also to create new AI algorithms and models to e.g. improve care pathways, diagnosis and treatments.

Hospitals are collecting huge amounts of data from its devices during diagnosis and treatment. Hospitals have the choice to keep this data on-premise or send it to the cloud. In many cases, Hospitals opt for a hybrid model where parts of its data and processing happen on premise and parts in the cloud.

This creates a few challenges – or at least interesting questions, which will be explained in the following case description.

Case Description

Healthcare has become an ecosystem, with many stakeholders involved. “There is no one digital frontdoor in the healthcare ecosystem” says Kirk Elder, PHM R&D Leader and Head of the HealthSuite Collaborative Care Ecosystem.



Provide an architectural design for the HealthSuite system of engagement’s Foundation capabilities in connection with the Engagement capabilities, and their interaction with Systems of record.

Incorporate the concerns and requirements of different stakeholders, such as:

- Healthcare providers
  - Availability, integration, performance, costs, quality (of outcomes)
- Informal caregivers
  - Communicate with formal caregivers about / on behalf of patient

    - View data (that the patient has provided access to)
- Patient (in the home, personal health)
    - Seamlessly interact with 'my health care' (could be different institutes/hospitals, different departments, general practitioners, etc.)
    - Remote measurements / remote healthcare
    - Contact with caregivers
    - (Automatic) signals and interventions
    - Be able to control who sees what ('own' their patient data)
- Payers / insurers
    - Lower the total costs
    - Have sufficient data to pay the (right) bills
- Privacy protection agency
    - Privacy, information security

Architectural challenges include:

- Integration (from systems of record to systems of engagement)
- Access (security, privacy, regulatory compliance)
- Availability (safety-critical systems)
- Integrity (ensure data is correct)
- Integrality (patient care pathways, 1 single experience)
- Deployment (What stays in the cloud, what moves on-premise?)

Glossary

Care pathways	Workflow at the hospital. From when the patient arrives until the patient departs the hospital.
Philips devices	Large medical machines such as MRI, CT scanners, but also smaller ones like vital signs monitors, wearable health patches, etc.
Digital health proposition	A unique solution offered to a hospital to solve complex problems with digital technology. For example:provide a way for data to move seamlessly between the departments at the hospital enabling the best user experience for the patient, doctor and technicians.
Quadruple aim	Philips lives by the motto of the quadruple aim: Better health outcomes, improved patient experience, improved staff experience, lower cost of care.
Users	The users of the philips devices typically are patients, doctors, GP, hospital staff, technicians, caregivers etc.
System of Record	Information is stored as “a system of record”.
Healthcare providers	Hospital, GP, Pharma, Medical centers etc.
HealthSuite or HSDP	HealthSuite Digital Platform or Philips cloud platform
Data from across their existing IT infrastructure	Assume that there are multiple data silos due to a variety of devices.
HIPAA privacy rule	Health Insurance Portability and Accountability Act of 1996: The HIPAA Privacy Rule establishes national standards to protect individuals' medical records and other personal health information and applies to health plans, health care clearinghouses, and those health care providers that conduct certain health care transactions electronically. The Rule requires appropriate safeguards to protect the privacy of personal health information, and sets limits and conditions on the uses and disclosures that may be made of such information without patient authorization. The Rule also gives patients rights over their health information, including rights to examine and obtain a copy of their health records, and to request corrections.
Philips health continuum