PROJECT ORIGINS
During a patient’s journey through the health system, data is captured in a variety of non-interoperable databases. In this multi-vendor environment, big players tend to act defensively through vendor lock-in. Siloed data means a lack of automatic data collection, integration or embedded decision support, which are also obstacles to multi-disciplinary collaboration within a hospital. For patients with chronic diseases like heart failure, self-management can lead to significant reductions in mortality and morbidity – yet data is typically not captured using physiological sensors and is therefore unavailable to clinical teams or for feedback to patients. All in all, this results in poorer treatment and higher costs of care.

To meet these demands, the PARTNER (Patient-care Advancement with Responsive Technologies and Engagement together) project has developed an architecture for multi-vendor interoperability to unify data sources and allow for patient self-monitoring. The result is continuous and personalised data that better reflects their state when not in hospital. This has been showcased in a demonstration of a single patient’s journey through cardiac care and encompasses a wide range of innovations, such as smart wearables, real-time collaboration and enhanced electronic health record (EHR) systems.

TECHNOLOGY APPLIED
Technologically, the heart of PARTNER’s common architecture is the PARTNER Hub. Via application programming interfaces for data registration and access-control lists, patient data is fed into an integration engine from sources such as EMR and Vendor Neutral Archives (VNA). Prototype sensors, alarms and wearables have also been developed to supply health data to the PARTNER Hub when a patient is at home. Within the PARTNER Hub, the integration engine creates enhanced EHR via data harmonisation in which different kinds of data are combined into visuals. The Fast Healthcare Interoperability Resources (FHIR) standard is a vital enabler of this, allowing data from wearables to be displayed in dashboards for the patient care team and information to be shared between different storage solutions.

Following harmonisation, data can be utilised in a large number of portals and dashboards across different platforms, such as an Enhanced Diagnostic Imaging Viewer. Platform independence means that new applications based on modular components can quickly be integrated into an organisation’s framework. Another aspect of the project is real-time, flexible collaboration solutions. For example, several partners have integrated patient data from multiple sources into Microsoft Teams, enabling collaborative assessment.
MAJOR PROJECT OUTCOMES

Dissemination
- Two papers published by the AMC.
- Journal publication on ECG processing (imec, Sep 2019).
- Publication on TAVI prediction model (Eindhoven University of Technology, Aug 2019).
- Paper submitted to International Solid-State Circuits Conference (Sep 2020).
- Poster presentation at the Transatheter Cardiovascular Therapeutics conference in San Diego (Oct 2018).
- Product updates and new services have been demonstrated at multiple healthcare shows like HIMSS (multiple vendors).

Exploitation (so far)
- (Barco) Synergi – a solution for digitising and improving the efficiency of multi-disciplinary team meetings.
- (XCO) Real-time assessment of frailty and health status of patients.
- (MedVision 360) Major upgrade for patient management, patient coaching module and wearables support.
- (ETRI) Prototype for HUB with medical portal for patients and clinicians.

Standardisation
- Usage of FHIR standards for interoperability (all vendors).
- Usage and improving of FHIR ECG standard (MedVision 360).

Patents
- 1 patent applications filed: https://uspto.report/patent/app/20180357982