ITEA 3

Project Results

PARTNER

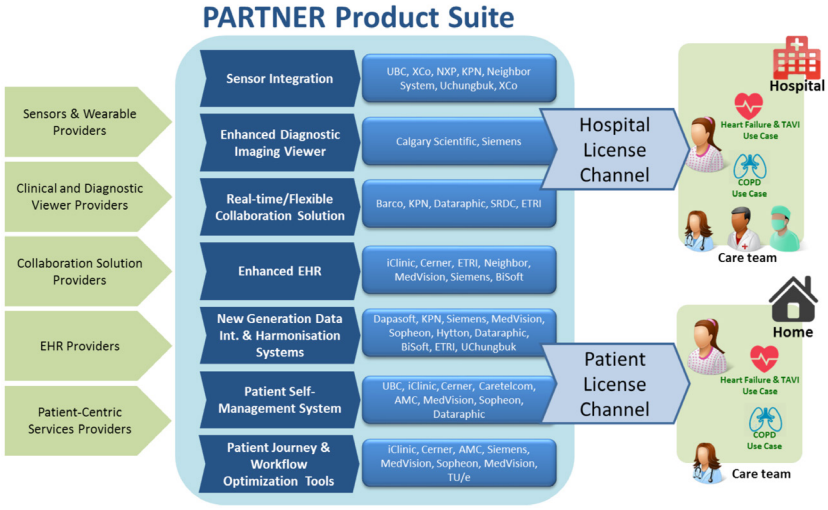
Data defragmentation for collaborative healthcare

EXECUTIVE SUMMARY

Data fragmentation and a lack of transparency are enormous problems in healthcare. A unified overview of a patient's status (including at home) would assist collaboration within hospitals and reduce costs while offering greater freedom and comfort to patients. The ITEA project PARTNER has therefore developed a common architecture for health data management and visualisation, resulting in two new systems, seven new services, five new products and nine enhancements related to cardiac care.

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

(including remotely). Patient data temporary secure storage, in which data is pushed to the cloud and disappears after three months, is used to ensure privacy and security. Finally, PARTNER also incorporates a number of predictive analytics, decision support and workflow optimisation tools, some of which feed information back to the patient (such as survey prompts or exercise advice). The architecture thus provides a complete loop.

MAKING THE DIFFERENCE

Worldwide, over 40 million people suffer from heart failure. A global challenge requires a global solution, so one of PARTNER's primary achievements has been bringing together partners from three continents. In addition to providing a wider reach, such collaboration has clear commercial opportunities for the consortium. XCO, for instance, has entered into a commercial agreement with iClinic, Kinduct, Indoc and OBI to complete a frailty care system in 2021; the target revenue from this is USD 163 million over 3.5 years. Sopheon has already launched Microsoft Teams integration as part of its Smart Accolade Platform, while MedVision has licensed its MEDrecord platform-as-a-service to the tune of EUR 100,000 in additional sales in 2020. The fact that these are smaller players highlights PARTNER's role in circumventing dominance by larger companies and the resulting lock-in.

Nonetheless, the project has opened doors for large players too: Barco's Synergi solution for multi-disciplinary team meetings is now being used in a pilot in two hospitals in the UK and Australia, representing a new business case which will allow them to push further into the health domain. For hospitals, the benefits of PARTNER uptake are twofold. Firstly, for healthcare professionals, it demonstrates that a patient-centric approach with an optimised collaborative care team leads to greater efficiency – up to a 10% improvement compared to traditional workflows – and a knock-on effect of healthcare costs. Secondly, improved transparency allows professionals to provide the best services for each individual patient. PARTNER's maxim is 'one patient, one team'; in other words, providing patients with the dedicated support of the same group of individuals and the smoother group decisions that this entails. When combined with the greater degree of freedom and comfort enabled by smart wearables, this should result in better health outcomes and, above all, a higher quality of life even when ill.

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.
- (Calgary Scientific) Additions to ResolutionMD: PureWeb Spaces, DICOMWeb.
- (XCO) Real-time assessment of frailty and health status of patients.
- (dapasoft) Additions to Corolar Cloud Platform: integration engine, iot and blockchain technology.
- (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

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Eindhoven University of Technology
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Koninklijke KPN
MedVision360
Siemens Healthcare Nederland
Sopheon

Republic of Korea
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Project start
October 2017

Project end
December 2020

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