CONFERENCE ABSTRACT

# Integrating data from apps, wearables and personal Electronic Health Record (pEHR) systems with clinicians' Electronic Health Records (EHR) systems

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**Intro**: With increasing number of pEHRs, health apps, medical sensors and patient-controlled tools appearing on the marked, there is a need for more tailored and coordinated use of health-related data from these kinds of tools. However, EHR systems are not yet equipped to receive and structure this data according to clinicians' needs, especially for chronic illnesses, which often require coordination of many health fields. The Full Flow project (Norwegian Research Council-funded project# 247974/O70) uses diabetes as use case to test the combination of patient-gathered data, the expertise of the primary and secondary medical systems, and data structuring formats. The aim is to create a platform through which data can be transferred and used to improve patients' health outcomes.

**Description of proposed solution**:

pEHR systems: With mobile devices now offering a way for individuals to monitor and reflect on their health state, such systems are becoming an individual's always-available self-management aid. These systems enable the patients to 1) access and analyze their own data at any time, 2) control the evolution of their disease by reflecting on their data and managing their health habits according to the goals co-defined by themselves and their health providers, and 3) choose the set of equipment and systems that best suits their disease management. While there is the potential for clinicians to participate in the conversations and decisions related to a patient's health situations recorded by these tools, the technological bridge is currently missing.

Interoperability: This bridge can be illustrated by using the Open Electronic Health Record approach: implementing semantic and functional interoperability. Semantic interoperability allows different systems to exchange data in a standard and structured way, by interpreting information meaningfully. Functional interoperability allows users to read medical information based on their needs. Together, these form the foundation for multidirectional flow of data via a universal and intelligent decision-support system for patients, clinicians and medical operational workflow. Being part of the National Editorial Group for Archetypes (NRUA) in Norway, the Full Flow will design archetypes and templates to ensure the interoperability between all actors.

Giordanengo: Integrating data from apps, wearables and personal
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<u>Smart agents meet smart actions:</u> Smart agents can be designed to send the correct medical information to the correct point in the care workflow, forming an autonomous decision-making system handling patients' data. This will ensure that relevant health data is known at the point of care by all actors in order to tailor the services given to the patient. The smart agents could also be configured to suggest goals or alarms according to a patient's current or impending situation (decision support).

**Discussion/conclusion:** Together, pEHR systems, the bridge of translational and interoperable functions, and medical knowledge from traditional medical protocols, have the potential to enable better healthcare services to be provided to patients, and a better understanding on how patient-gathered data can affect the medical decision-making processes. The Full Flow project explores the possibilities and effects of integrating and sharing self-gathered diabetes measurements for a full flow of data within the medical sector as well as the effects this will have on patients' motivation and self-management, see Figure 1.
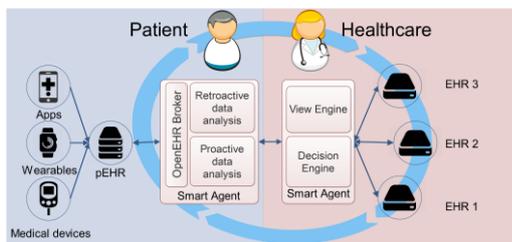


Figure 1:
Illustration of the project's flow of data, building on the patient tools, EHR systems and use of smart agents. Using the openEHR approach with archetypes and templates will ensure the interoperability between components, clinical workers and patients.

**Keywords:** mHealth; pEHR; EHR; interoperability; OpenEHR; Electric Health Record