A Federated Collaborative Care & Cure Cloud Architecture for Addressing the Needs of Multi-morbidity and Managing Poly-pharmacy

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Introduction

A growing share of the population (20% in 2010) in OECD countries is over 65 and expected to reach 20% by 2030 (WHO, 2010). Most of these older people have at least 2 chronic conditions, and more than half of all older people have at least 3 chronic conditions, with multi-morbidity expected to be even more prevalent in the future. This clinical management of patients with multi-morbidity is much more complex, disconnected, and time-consuming than that of those with single diseases. As a result, multi-morbidity patients with long-term care needs experience information overload and gaps in their care provision.

The C3-Cloud project aims to achieve high quality and connected healthcare for older people through the support of information and communication technologies (ICT).

C3-Cloud Approach

C3-Cloud establishes an ICT infrastructure to enable continuous coordination of patient-centered care activities by a multidisciplinary care team (MDT) and patients/clinical care givers.

Key features of C3-Cloud include:

1. An e-Health data platform for integrated care with the support of information and communication technologies (ICT).
2. Personalized Care Plan Development Environment, based on evidence-based clinical guidelines and reconciliation of multiple care plans.
3. A Reconciliation Care Plan Development Platform allows collaboration creation and execution of personalized care plans for multi-morbidity patients through systematic and semi-automatic reconciliation of clinical guidelines.
4. Disease-drug and drug-drug interactions.
5. Self Management.
6. Disease-based Workflow Management.
7. Disease-Drug and Drug-Disease Interactions.
9. Coordinated Informatics System.
10. A federated Collaborative Care & Cure Cloud.

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Fig. 1 – An overview of C3-Cloud Architecture

Fig. 2 – A snapshot from Personalized Care Plan Development Environment

Fig. 3 – An example from Reconciliation Care Plan Development Environment

Fig. 4 – Utilization of Clinical Decision Support Modules for Care Plan Creation and Reconciliation of Multiple Care Plans

Seamless Integration with Existing Health/Social care Information Systems

Fusion of multimodal patient data will be achieved via C3-Cloud Interoperability Workbench. EHR-based interfaces with existing health/social care information systems are being implemented for addressing local interoperability, while a terminology server is utilized for addressing semantic interoperability challenges.

Active Patient Reconciliation through History Empowerment Platforms

Active patient reconciliation will be realized through a History Empowerment Platform, ensuring patient needs are captured in decision making.

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