Coordinated Care & Cure Delivery Platform

Functionality

Coordinated Care and Cure Delivery Platform (C3DP) allows collaborative creation and execution of personalised integrated care plans for multi-morbid patients by a multidisciplinary care team (MDT) including GPs, specialists, nurses, physiotherapists, geriatricians, nutritionists, social care and homecare workers. Via integration with tens of Clinical Decision Support (CDS) services automating evidence-based clinical guidelines, C3DP processes electronic health records of the individual patients and provides guidance to the multidisciplinary care team members for i) risk prediction and stratification, ii) personalized selection of treatment goals and interventions in the light of evidence based guidelines, iii) reconciliation of conflicting treatment options, and iv) management of polypharmacy. Integration with local health and social care systems is achieved via C3-Cloud Interoperability Middleware. Active patient involvement and treatment adherence is achieved via integration with a Patient Empowerment Platform (PEP), ensuring patient and informal care giver needs are respected in decision making and their preferences and psychosocial aspects are considered.

C3DP can easily be integrated with existing EHR/EMR systems thanks to its patient data and care plan data model based on HL7 FHIR®. C3DP can be also easily integrated with existing CDS services, especially when they are compliant with CDS Hooks specification.

Solution Components

C3DP is composed of the following software components:
- *C3DP Web Application*: The rich and modern Web application for management of personalised care plans
- *onFHIR.io FHIR Repository:* Easily customisable, high-performance and highly scalable open source HL7 FHIR® Repository.
- *Event API*: For real-time system notifications
- Internal CDS Services: Supporting CDS services with less complex decision trees, compliant with CDS Hooks specification.
- *Security and Privacy Suite (SPS):* Authentication and authorisation of all users via integration with existing Identity Provider (IdP) systems. Supports OpenID Connect 1.0, OAuth 2.0, Smart App Authorisation, and custom JWTs.

C3DP is also integrated with all other C3-Cloud components (complex CDS services, PEP, Interoperability Middleware) via standards-based interfaces.

Users

The end users of C3DP are members of a multidisciplinary care team including health (GPs, specialists, nurses, physiotherapists, geriatricians, nutritionists …) and social care professionals. Ideally, C3DP is targeted for organisations that aim to provide integrated care (i.e. regional / national health authorities), but it is also possible to benefit from C3DP in a single node (e.g. inside a hospital).

Benefits

The major benefits are:

- Serving a generic, disease-independent platform for personalised care plan management supporting both longitudinal integrated care plans and disease-specific treatment plans
- Standardisation of high-quality health and social care in chronic disease management by implementing regional / national clinical guidelines
- Empowering the clinical work force in chronic disease management via CDS services automating evidence-based clinical guidelines
- Semi-automatic reconciliation of conflicting recommendations from multiple disease guidelines
- Improved cooperation among health and social care workers
- Facilitating active participation of patients and informal care givers
- Easy integration with existing local systems (EHR, CDS, AuthN & AuthZ) through support of widely-used standards and specifications
- Extended service / product range for industry customers

Benchmarking

Compared to similar solutions on the market, C3DP care plan management software is:

- Based on open standards and specifications (HL7 FHIR® resources and API, CDS Hooks, OpenID Connect 1.0, OAuth 2.0, …) to facilitate integration.
- Disease independent. Support for a new disease can be added easily with new CDS services in a plug-and-play manner.
- Agnostic to natural languages and reference terminologies. It already supports 4 languages and several terminologies.

Limitations

Limitations and future plans:

- Although C3DP supports bi-directional data integration with local EHR systems, it could not be possible to integrate care planning data in C3DP to local systems in C3-Cloud, due to non-technical reasons. However, this has been achieved in another national-scale project.
- Poorly coded or structured patient data at the local EMRs/EHRs is a challenge.
- As a near-time upgrade, C3DP will support HL7 FHIR® R4 in addition to STU3.
- Integration with local appointment scheduling, e-prescription, and laboratory order systems is also in development plans.

Business Model

C3DP business model is based on one-time integration and customisation fee at first and then yearly fee for usage license and maintenance support for health organisations. Model is more flexible for industry partners. C3DP and all sub-components are maintained in-house; there is no third-party license or fee involved.

Implementation

C3DP can be implemented in a new site and integrated with local systems in only a few months. The exact duration would depend on a few factors:

- Is clinical data provided already in a standard format and API? In case there is support for HL7 FHIR®, clinical data integration is almost immediate. If not, C3-Cloud also provides an Interoperability Middleware.

- Will there be need for new CDS services? If so, are the clinical guidelines and/or implementable specifications in place?

Having said that, the C3-Cloud technical team members are experienced in implementation of such systems in diverse settings.

Dependencies

Technical and organisational dependencies:
- C3DP is installed inside the secure perimeters of a health organisation. If the user requests, it can be installed in a secure European cloud as well.
- There is no OS dependency, but Linux servers are preferred.
- User training can be done remotely via videos and reading materials.

Customisation

C3DP provides a generic and disease-independent platform, which can easily be customised according to the local care pathways, targeted diseases and clinical guidelines.