

Patient Registration and Identity Management Services for Health Information Exchanges

Two-Sentence Overview

IntraHealth's new Open Client Registry (OpenCR) represents a foundational global good supporting identity management needs in developing countries using leading technologies, including the powerful ElasticSearch engine and the reference standards-based HAPI FHIR server. Building on its successful real-world pilot, IntraHealth and partners Regenstrief, Ona, and IntelliSOFT seek to expand OpenCR into a robust, high-value global good and field test it with select ministries of health through a consortium that includes unparalleled international design and deployment expertise in client registry and identity management as well as leadership within the OpenHIE architecture and client registry communities.

High-Level Budget Summary

To be completed in the application finalization step.

Executive Summary

Accurate and precise patient identification is essential for the digitization of health data and essential for the realization of safe patient care, the retention of vulnerable populations, epidemic control, and step changes in population-level health. The use of unique identifiers and identity management are the basis of shared health records and together they enable better health outcomes and improve resource allocation, provide for more accurate monitoring and population health data, and support data for strategic decision making.

IntraHealth recently completed development of an open source, standards-based prototypical client registry, [OpenCR](#), which was built to safely and uniquely identify patients who have demographic information stored in multiple health information systems. Leveraging IntelliSOFT's relationships with ministries, Ona's understanding of the evolving security landscape, and Regenstrief's expertise developing client registries in high-and low-resource settings, the consortium proposes to rapidly expand the functionalities of OpenCR to meet the global community's unmet need for a standards-based, advanced, yet accessible open source client registry to support longitudinal management of patient data across the health sector.

The initial use case driving development for OpenCR was developed to match and link records together under a single unique ID. With funding from Digital Square, the consortium team plans to complete the expansion of the OpenCR prototype into a broadly applicable global good across a wide variety of low-resource settings and use cases to enable countries to track patient records across health information systems.

As a cornerstone of interoperability, OpenCR will help realize the vision of electronic health records (EHR) and health information exchanges to support scalable, safe, and effective care especially in low-resource settings.

Consortium Team

IntraHealth International will lead the overall solution development process with consortium partners Regenstrief, Ona, and IntelliSOFT.

IntraHealth International is a global health NGO with a 40-year history in developing successful data tools and digital health applications for health workers and managers, including OpenCR, a prototypical open source, standards-based client registry. We develop solutions that are open source, data-driven, sustainable, and collaborative. As a pioneer in the field of health workforce informatics, we're committed to using technology, information, and analytical approaches to support the people at the center of our health systems. IntraHealth's experienced Digital Health team will lead rapid expansion of OpenCR to meet the community's unmet need: Luke Duncan has over 20 years of experience in software

development, including leading the development of multiple data interoperability standards and reference designs. Richard Stanley, PhD, has 24 years of experience in information and communications technology. Emily Nicholson, MPH, has more than 10 years of experience leading and supporting digital health global goods and serves on the leadership team of the OpenHIE community. Ally Shaban is an expert in software analysis, design, and development. Finally, Dana Acciavatti has 19 years of experience strengthening health systems, including leading project management for IntraHealth's portfolio of digital health projects.

The Regenstrief Institute's Center for Biomedical Informatics, including the Global Health Informatics program, has 40 years of experience in the design, deployment, implementation and utilization of health information technology, with particular strength in supporting the use of standard terminology and standardized metadata, patient record keeping systems, and standards-based health information exchange. Regenstrief is the creator of OpenMRS, an open source electronic medical record system, and leader of the global OpenHIE community, which includes coordinating the OHIE Implementers Network, leading the OHIE Architecture Community and Review Board, and leading multiple OHIE subcommunities including the Client Registry subcommunity. Regenstrief will support Work Package One with high-level solution design, will bring forth feedback from the OpenHIE community, and will contribute to Work Package Four. Regenstrief's key team members include Dr. Shaun Grannis, Jennifer Shivers, and Paul Biondich. Shaun Grannis, MD, MS, FAAFP, FACMI, FAMIA has contributed to ensuring patient identity in a wide range of settings, including overseeing the development of the architecture for Rwanda's first HIE client registry, working with the Pew Charitable Trust in their evaluation of the use of biometrics in healthcare, and speaking before congressional representatives in 2019 regarding the US national identity strategy. Jennifer Shivers, MFA, is a health information technology integration and process design specialist with over 25 years of experience. Paul Biondich, MD, MS, FACMI, is a senior medical informatics researcher and the co-founder and project lead of OpenMRS, currently deployed in more than 80 countries worldwide.

Established in early 2014, Ona (which means "to see" in KiSwahili) is a design and engineering social enterprise with offices in Burlington, Vermont and Nairobi, Kenya. Ona's mission is to help ensure equitable access to services to those who need them most. Ona achieves this by developing technical solutions trusted by the world's leading organizations. Ona builds technology that affords new opportunities for governments, international organisations, development organizations, and related actors to be increasingly collaborative, data-driven, and accountable to the people they serve. Ona makes tools that provide opportunities for organizations to make better use of their data to help address some of the world's great challenges, including: maternal and child health, education, community resilience, agriculture, environmental sustainability, access to infrastructure and government accountability and others. Ona is the lead technology partner for the open source global good OpenSRP, currently deployed in more than 12 countries globally. Ona will contribute to Work Package One and deliver Work Package Three. Contributions will be led by Peter Lubelle-Doughtie, MS (CTO), Jason Rogena (Site Reliability Engineering Lead), Samuel Githengi (Senior Engineer), Emmanuel Tarus (Senior Engineer), and Craig Appl, MPH (Health Technical Lead).

IntelliSOFT Consulting Ltd. is a Kenyan-based company that has been implementing health information systems in East Africa since 2009. IntelliSOFT will use its national client registry and unique patient identifier experience in Tanzania and Kenya to undertake Work Package Two, leveraging its strong relationships with ministries of health and their partners to ensure effective field testing of OpenCR. IntelliSOFT's contributions will be led by Steven Wanyee, an accomplished digital health expert with more than 18 years of experience implementing digital health solutions across Africa with support from Peter Anampiu, Kenneth Ochieng, and Susan Gath. Peter Anampiu is an experienced business analyst with over 10 years of experience, including implementing enterprise level systems. Kenneth Ochieng is a senior software developer with over 10 years of experience developing large scale digital health solutions. Susan Gath is a certified Project Management Professional with more than 5 years of experience managing large digital health projects in East and Southern Africa.

Background or Problem Statement

Comprehensive patient identity management is essential to realize the clinical and analytical promise of electronic health records (EHR) within a health information exchange. As the core function of a client registry, identity management is a foundation required for supporting key health activities for continuity of care, longitudinal records, case reporting, and for calculating accurate metrics. Yet identity management remains elusive for many reasons, including siloed points of care systems that lead to multiple identifiers; dynamic patient mobility across providers either out of practical necessity or due to social factors; and a gap in software that supports the required governance frameworks that balance the sharing of life-saving clinical information, confidentiality, and patient privacy.

The OpenHIE Community of Practice has convened and advocated for health information sharing and pursued the participation of open source client registry software products, and identified the functional and workflow requirements for a client registry based on modern, open standards. Using the OpenHIE Architecture Specification as a guiding framework, IntraHealth conducted a landscape analysis of current client registry software which notes gaps in products around open source development processes and adherence to open standards. What also emerged is a gap in client registry solutions with regard to supporting the required governance frameworks that cover the spectrum of trust levels between systems and the client registry in order to address privacy, IT security, and confidentiality.

IntraHealth developed OpenCR, a prototypical open source client registry, with USAID funding through MEASURE Evaluation. OpenCR was designed to uniquely identify individuals who have records in multiple information systems to help countries track patients through the continuum of care. Development was informed by stakeholders in Uganda, including the Ministry of Health (MOH) and the Central Public Health Laboratory (CPHL), as well as technical teams at CDC and USAID. OpenCR was built to support epidemic control by facilitating the deduplication of patients' lab test results for tracking outcomes over time and identifying those lost to follow up. To meet both the needs of Uganda's specific use case and ensure global applicability, the initial release of OpenCR already supports:

- 45 algorithm variations using the popular ElasticSearch engine and plugins. This includes support for deterministic and probabilistic matching.
- Record linkage and Registration as a Service through the generation of unique IDs with a non-destructive, auditable history of submissions.
- A modern UI to view, break, revert breaks, and audit matching decisions.
- Updated OpenMRS MPI Client Module to support OpenCR.
- Open standards, including the FHIR-based Mobile Patient Demographics Query (PDQm ITI-78) and Mobile Patient Identifier Cross-reference Query (PIXm ITI-83).

This proposal is to leverage and build upon the initial work done by Intrahealth to apply to broader use cases. The consortium proposes to complete development of OpenCR as a flexible global good that fulfills the existing need within the OpenHIE architecture to track patient records across health information systems and embrace the real world use cases of complex, fragmented systems and provide software support to governance in order to ensure patient privacy and confidentiality.

Digital Health Technologies

Architecture

OpenCR was developed to support an architectural pattern for national scale and is scalable to production environments of any size. OpenCR is not one application, rather it is a set of applications that work together to serve point-of-service systems, like EMRs, health financing platforms, and labs.

The OpenCR architecture includes the OpenCR Service, the API for managing queries, routing traffic to the components, and a UI to view and break matches between records and view matching histories; the HAPI FHIR Server, the reference FHIR server in Java; and ElasticSearch, a powerful search engine that is highly performant. HAPI FHIR Server additionally requires Postgres, a popular and powerful SQL database. The architecture initially supports OpenHIM for authentication, authorization, and auditing.

Standards

As a patient identity management platform, OpenCR will meet or exceed requirements established by the OpenHIE Architecture workflows and functional requirements for a Client Registry. A comparison of

OpenCR to the OpenHIE Architecture Specification 3.0 reveals that OpenCR fully meets three of the four required workflows and five of the 10 functional requirements and recommendations. The proposed activities described in the proposal will finalize compliance with all workflow and functional requirements of the OHIE Specification.

The consortium members, through open collaboration in the OpenHIE community of practice, work on the core standards in IHE for client registries, which are already or will be implemented through the proposal, including:

- The Patient Demographics Query for Mobile (PDQm) Profile: PDQm defines a lightweight interface for patient demographics. (This is already supported in OpenCR.)
- The Patient Identifier Cross-reference for Mobile (PIXm) Profile: PIXm exists for supporting querying of patient identifiers from diverse systems and is designed for mobile platforms and browsers. (This is already supported in OpenCR.)
- The Patient Master Identity Registry (PMIR) Profile: PMIR supports managing patient master identities and for clients to subscribe to future changes. Implementation will include the Mobile Patient Identity Feed (ITI-93) and Subscribe to Patient Updates (ITI-94). (This is to be implemented in OpenCR.)

Use Cases and User Stories

Identity Management Maturity Model

A client registry is foundational to improving health outcomes, lowering costs, and increasing efficiency. We propose a maturity model for identity management based on existing maturity models. The Identity Management Maturity Model in the attached Appendix 1 illustrates the move from the siloed and peer-to-peer (integrated) maturity level to the interoperable maturity level with regard to the value-add for public health, and the added capabilities and responsibilities associated with the level.

The maturity levels are based on the ability to share information and associated responsibilities for governance:

- **Siloed systems** are isolated implementations where there is little to no sharing of information. This is common in low-resources settings where many projects have historically created systems for their use case without coordination. The lack of information exchange makes them inefficient in both the clinical sense and with regard to business allocations. There is more potential for errors and lost opportunities for holistic clinical care.
- **Peer-to-peer (integrated) systems** are a common solution to increase the business value-add of peer-to-peer systems. Often this means custom systems integration but without standards. While the solutions may perform their roles, the exchange of information is tightly coupled (integration not interoperability). Peer-to-peer systems are difficult to scale to other systems as they are custom solutions.
- **Interoperable systems** employ standards-based exchanges. Solutions based on them, like shared health records, solve double-counting. This maturity level has the least potential for clinical errors. However, by being the most flexible and powerful, this maturity level requires the highest responsibility for governance, IT security, and privacy. This means managing a broad spectrum of trust levels with participating systems.

The maturity model informs the user stories for feature development. Countries at different levels of maturity will benefit from the Client Registry and as their maturity levels will be different the functionality will be flexible enough to adapt to different capabilities of systems and governance.

Client Registry Functional User Stories

The maturity model described above identifies the increased data analysis and functionalities provided by robust identity management, which are commensurate with additional accountability and responsibilities. This thinking frames the user stories for feature development, which focus on those who are directly using the software, rather than patients who receive business value-add but are not directly interacting with the system software.

Table 1 below summarizes both the existing features in OpenCR and proposed software requirements to meet the business needs, organized by functional user. Though OpenCR can support any FHIR store of patient demographic data, the user stories below use an EMR for explanation. Building on the first iteration of OpenCR, the following functional roles (actors) and responsibilities are enabled with this proposal:

- **Facility-based Data Entry Clerks (Point-of-care [POC] systems users)** will continue to register patients and update demographic information in their systems; client demographic data can automatically be sent to OpenCR.
- **POC system developers** will be able to receive subscriptions of patient updates to their systems. This is especially necessary when a particular system is indicated to be the source of truth.
- **MOH Matching reviewers and administrators** will be able to use a user interface for configuring decision rules and linking, merging and/or breaking matches, and will be able to manage the bulk import of records.
- **MOH Systems administrators** will be able to set the full spectrum of trust levels with the submitting systems, configure robust authentication and authorization using an open source platform, and provide easy demos and training using Instant OpenHIE.

Table 1: Overview of User Stories and Features

Functional User Roles (As a...)	Responsibilities (I need to...)	Existing Features	Proposed Features
POC systems users	Be able to securely send standards-based patient information to the CR to obtain a unique identifier in the background. Update patient demographic information.	Provides unique identifier from Client Registry. Update patient demographic information in Client Registry.	None.
POC system developers	Add Client Registry integration into POS systems. Subscribe to updates from other systems.	PDQm & PIXm standards for submitting patient information. OpenMRS module to help with integration.	PMIR standard for source systems to subscribe to change events (pub-sub) of demographic information.
MOH Matching reviewer and administrator	Set up and test decision rules, and view and break matches. Load patients directly, manage merges.	JSON configuration file to set up decision rules. UI for viewing and breaking matches.	UI for configuring decision rules. Bulk import of Patient Identity records. UI for Manage merging records.
MOH Systems administrator	Provide accounts to manually adjudicate records. Ensure privacy, and IT security across the full spectrum of levels of trust for systems, nodes, and users.	Node authentication. Simple user authentication. OpenHIM as optional auditing and auth{z n} provider.	Set the full spectrum of trust levels with the submitting system. Robust auth{z n} platform. Easy demos and training using Instant OpenHIE

Objectives and Activities

Work package 1: Modifications to design and functionality of OpenCR

Objective 1.1: To meet the needs of additional use cases, IntraHealth will grow capabilities within the OpenHIE Community, facilitate uptake, and provide a platform that grows with the needs of the users.

Activity 1.1.1: Support additional IHE profile actors and transactions beyond existing support for PIXm and PDQm, including PMIR - Patient Identity Manager, Mobile Patient Identity Feed (ITI-93) and Subscribe to Patient Updates (ITI-94)

Activity 1.1.2: Include easy, configurable entity matching UI and decision rule management.

Activity 1.1.3: Support merging and golden record management for reviewing, accepting, and rejecting changes.

Activity 1.1.4: Support bulk matching options to include the ability to bulk import and export patients.

Activity 1.1.5: Support attribute management, including the ability to start from a default patient resource and then modify it to add common extensions.

Objective 1.2: Ona will provide a robust, flexible, easy-to-manage authentication and authorization system for enhanced security and auditing.

Activity 1.2.1: Integrate a proven open source authorization and authentication platform to provide enterprise-scale, easy-to-manage authentication and authorization for accessing and updating OpenCR.

Activity 1.2.2: Develop robust roles in the authorization platform that support the transactions defined in objective 1.1 and ensure that they are reflected in OpenCR.

Activity 1.2.3: Integrate OpenCR with an open source robust, centralized logging system that provides logging of all transactions that took place in the authorization system and OpenCR.

Objective 1.3: IntraHealth and consortium members will undertake iterative design and software development with key global stakeholders and user groups.

Activity 1.3.1: Participate in OpenHIE Client Registry Community to solicit feedback on design, features and issues.

Activity 1.3.2: Maintain a publicly available GitHub issue tracker so users are able to create tickets and issues on a transparent platform.

Activity 1.3.3: Incorporate features and feedback from Ministries of Health (work package 2) and iterate based upon feature requests.

Work package 2: Validate Modifications with Ministries of Health

Objective 2.1: IntelliSOFT will focus on field testing OpenCR with one to two select ministries of health, including gathering requirements and validating use cases with governments grappling with the issue of identity management to ensure that the product is both accessible and functional in low resource settings. Potential countries for collaboration include Liberia, Uganda, Rwanda, and Malawi.

Activity 2.1.1: Facilitating community engagement and country-level field testing of OpenCR with select ministries of health to validate use cases, functionality, and usefulness.

Activity 2.1.2: Testing the OpenMRS MPI Client Module.

Activity 2.1.3: Exploring the use of OpenCR in cross-border contexts, such as shared governance of a system between two sovereign governments and how to manage patient identities when data sets differ between countries.

Activity 2.1.4: Validating the Instant OpenHIE demo and testing platform for OpenCR with potential users.

Work package 3: OpenCR Shared Health Record (SHR) Gap Analysis

Objective 3.1: Ona will investigate, document, and develop a software roadmap for using OpenCR's existing FHIR resources to support a shared health record. OpenCR's technology stack supports the core workflows of storing FHIR documents with minimal additional investment. This objective focuses on comparing the existing capabilities against the Shared Health Record architecture features and functions.

Activity 3.1.1: Develop a gap analysis that documents OpenCR's current features against the OpenHIE Shared Health Record capabilities and workflows as defined in the OpenHIE Specification Release 2.0 and defines a software development roadmap.

Activity 3.1.2: Present the gap analysis from Activity 3.1.1 to the OpenHIE Shared Health Record community working group

Work package 4: Testing, DevOps, Packaging, and Documentation

Objective 4.1: IntraHealth and Regenstrief will create a testing framework, document proposed enhancements to OpenCR, building upon the [comprehensive documentation](#) we developed for OpenCR's first release.

Activity 4.1.1: Build a repeatable testing framework, indicators, reporting and coverage.

Activity 4.1.2: Documenting work developed under Work Packages One and Two.

Activity 4.1.3: Enhancements to the OpenCR User Guide and Developer Guide.

Activity 4.1.4: DevOps and packaging for the Instant OpenHIE platform.

Activity 4.1.5: Create packaging and continuous integration and continuous delivery (CI/CD) processes.

Activity 4.1.6: Create a website that includes a hosted demo site with realistic but fake data for individuals to acquaint themselves with the functionalities of a CR and how to use a limited set of algorithms.

Dependencies: Work Package One is the core development of expansions and modifications to the design and functionality of OpenCR. Work Packages Two, Three, and Four build upon the iterations in Work Package One and enable consultation with stakeholders to ensure that the features are based on the needs of potential implementers. There are no interdependencies between the packages other than dependence on the core deliverables in Work Package One.

Community Feedback

The development of OpenCR was heavily influenced by the expertise shared on monthly OpenHIE Client Registry Subcommunity calls where progress would continue under this award. The consortium will also present and review the broader OpenHIE community at upcoming events, including the virtual 2020 OpenHIE Community Meeting.

With regard to soliciting input from country stakeholders, the consortium has defined a dedicated work package (WP2) to encompass those activities to ensure there is critical input on the project.

Schedule

The following is a high-level work plan.

Activity	Team Location	Month								
		[M]	[M]	[M]	[M]	[M]	[M]	[M]	[M]	[M]
		1	2	3	4	5	6	7	8	9
WP1, Objective 1.1, Activity 1.1.1	IntraHealth, US	x	x	x						
WP1, Objective 1.1, Activity 1.1.2	IntraHealth, US	x	x	x						
WP1, Objective 1.1, Activity 1.1.3	IntraHealth, US	x	x	x						
WP1, Objective 1.1, Activity 1.1.4	IntraHealth, US				x	x	x			
WP1, Objective 1.1, Activity 1.1.5	IntraHealth, US				x	x	x			
WP1, Objective 1.2: Activity 1.2.1	Ona, US				x	x	x			
WP1, Objective 1.2, Activity 1.2.2	Ona, US				x	x	x			
WP1, Objective 1.2, Activity 1.2.3	Ona, US				x	x	x			
WP1, Objective 1.3, Activity 1.3.1	All, US				x	x	x	x	x	x
WP1, Objective 1.3, Activity 1.3.2	IntraHealth, US				x	x	x	x	x	x
WP1, Objective 1.3, Activity 1.3.3	IntraHealth, US				x	x	x	x	x	x
WP2, Objective 2.1, Activity 2.1.1	IntelliSOFT, TBD	x	x	x						
WP2, Objective 2.1, Activity 2.1.2	IntelliSOFT, TBD	x	x	x						
WP2, Objective 2.1, Activity 2.1.3	IntelliSOFT, TBD						x	x	x	x
WP2, Objective 2.1, Activity 2.1.4	IntelliSOFT, TBD						x	x	x	x
WP3, Objective 3.1, Activity 3.1.1	Ona, US			x	x	x				
WP3, Objective 3.1, Activity 3.1.2	Ona, US			x	x	x				
WP4, Objective 4.1, Activity 4.1.1	IntraHealth, Regenstrief, US	x	x	x	x	x	x	x	x	x
WP4, Objective 4.1, Activity 4.1.2	IntraHealth, Regenstrief, US	x	x	x	x	x	x	x	x	x

WP4, Objective 4.1, Activity 4.1.3	IntraHealth, Regenstrief, US	X	X	X	X	X	X	X	X	X
WP4, Objective 4.1, Activity 4.1.4	IntraHealth, Regenstrief, US	X	X	X	X	X	X	X	X	X
WP4, Objective 4.1, Activity 4.1.5	IntraHealth, Regenstrief, US	X	X	X	X	X	X	X	X	X
WP4, Objective 4.1, Activity 4.1.6	IntraHealth, Regenstrief, US	X	X	X	X	X	X	X	X	X

Deliverables

Deliverable	Month Due
WP1, Objective 1.1, Activity 1.1.1: Support additional IHE profile actors and transactions	M3
WP1, Objective 1.1, Activity 1.1.2: Include easy, configurable entity matching UI and decision rule management.	M3
WP1, Objective 1.1, Activity 1.1.3: Support merging and golden record management for reviewing, accepting, and rejecting changes.	M3
WP1, Objective 1.1, Activity 1.1.4: Support bulk matching options to include the ability to bulk import and export patients.	M6
WP1, Objective 1.1, Activity 1.1.5: Support attribute management, including the ability to start from a default patient resource and then modify it.	M6
WP1, Objective 1.2: Activity 1.2.1: Integrate a proven open source authorization and authentication platform	M6
WP1, Objective 1.2, Activity 1.2.2: Develop robust roles in the authorization platform that support the transactions defined in objective 1.1.	M6
WP1, Objective 1.2, Activity 1.2.3: Integrate OpenCR with an open source robust, centralized logging system that provides logging of all transactions.	M6
WP1, Objective 1.3, Activity 1.3.1: Participate in OpenHIE Client Registry Community to solicit feedback on design, features and issues.	M9
WP1, Objective 1.3, Activity 1.3.2: Maintain a publicly available GitHub issue tracker so users are able to create tickets and issues on a transparent platform.	M9
WP1, Objective 1.3, Activity 1.3.3: Incorporate features and feedback from Ministries of Health (work package 2) and iterate based upon feature requests.	M9

WP2, Objective 2.1, Activity 2.1.1: Facilitating community engagement and country-level field testing of OpenCR with select ministries of health.	M3
WP2, Objective 2.1, Activity 2.1.2: Testing the OpenMRS MPI Client Module.	M3
WP2, Objective 2.1, Activity 2.1.3: Exploring the use of OpenCR in cross-border contexts	M9
WP2, Objective 2.1, Activity 2.1.4: Validating the Instant OpenHIE demo and testing platform for OpenCR with potential users.	M9
WP3, Objective 3.1, Activity 3.1.1: Develop a gap analysis that documents OpenCR's current features against the OpenHIE Shared Health Record	M5
WP3, Objective 3.1, Activity 3.1.2: Present the gap analysis from Activity 3.1.1 to the OpenHIE Shared Health Record community working group	M5
WP4, Objective 4.1, Activity 4.1.1: Build a repeatable testing framework, indicators, reporting and coverage.	M9
WP4, Objective 4.1, Activity 4.1.2: Documenting work developed under Work Packages One and Two.	M9
WP4, Objective 4.1, Activity 4.1.3: Enhancements to the OpenCR User Guide and Developer Guide.	M9
WP4, Objective 4.1, Activity 4.1.4: DevOps and packaging for the Instant OpenHIE platform.	M9
WP4, Objective 4.1, Activity 4.1.5: Create packaging and continuous integration and continuous delivery (CI/CD) processes.	M9
WP4, Objective 4.1, Activity 4.1.6: Create a hosted demo site with realistic but fake data.	M9

Global Good Maturity Model Assessment

Global Good Maturity



Assessment link

https://docs.google.com/spreadsheets/d/1Mv_IS8OCbQ3395lgrCRZXLMOlg2T5Kw8zKlphz7q-rU/edit?usp=sharing