

IHE Case Study: National Portal for Digital Exchange of COVID-19 Patient Data in The Netherlands

Contact Information

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General Description of Project

Philips has created an online portal that allows Dutch hospitals to seamlessly share COVID-19 patient information with one another. The portal was developed in cooperation with Erasmus Medical Center (Rotterdam, The Netherlands), Jeroen Bosch Hospital ('s-Hertogenbosch, The Netherlands), and the Netherlands Ministry of Health, Welfare and Sport (VWS). In the fight against an escalating pandemic like COVID-19, being able to share patient data between hospitals at the “touch of a button” is vital to optimizing the use of healthcare resources. For example, it can assist in the seamless transfer of infected patients between hospitals to avoid local overload in critical care units. Since its launch on March 28, 95 percent of Dutch hospitals have already been connected to the portal for digital exchange of COVID-19 patient data.

The new COVID-19 portal, which is available to all Dutch hospitals, is not linked directly to an individual hospital's EPD (electronic patient dossier), PACS (picture archiving and communication system), or pathology department system. Instead, specific information, such as a patient's radiology images, reports, and patient summary, is shared via the portal. The information is instantly available to a receiving hospital, provided that the originating hospital and the patient have given their explicit consent.

The safety of medical data exchange remains of the utmost importance, even in times of crisis. As a result, the portal fully complies with the ISO27001 information security standard and the Dutch NEN7510 standard, which is specifically designed for information handling in the healthcare sector.

"In this time of crisis, Philips is offering a solution for sharing patient data between hospitals quickly and securely," said Simon Vermeer, Chief Information Officer (CIO) at the Erasmus Medical Center. "Sharing patient data needs to be done in a secure way, and the current solution is often to send a USB stick or DVD. I am extremely proud that we were able to implement this portal together with the government, Jeroen Bosch Hospital, and Philips in this short term to support care for patients with COVID-19. I would also like to express my gratitude to the teams at all the organizations that have worked hard on this."

Philips Interoperability Solutions built the new COVID-19 portal on top of its existing XDS cloud document sharing service, which allows patient data to be sent digitally in a secure manner. For more information, visit the Philips contact page [linked here](#).

Project Scope/Scale

Functions of the Portal

The purpose of the portal is to provide hospitals with the means to safely exchange medical information. The functions that primarily support this process are:

- A central user management system that allows to process incoming requests and register users and their corresponding hospital details.
- A central web application that allows users to log in and:
 - Search for existing patients that have been registered (by the transferring hospital)
 - Register patients and the required unique patient details (e.g. the patient name and id)
 - Provide medical information in PDF format
 - Provide medical information in HL7 CDA (XML) format
 - Upload of DICOM (Part 10) studies through an image upload module
 - Register consent and provide access to uploaded information on hospital level
 - Download the information that was made available in their corresponding format (PDF, HL7 CDA, or DICOM ZIP)

To avoid barriers and limitations, the portal is a zero-footprint solution available via the internet. With appropriate access, any hospital can connect to the portal without specific infrastructure needs. An internet connection and suitable up-to-date browser are enough. The portal functionality will likely be further developed to meet the evolving needs of the hospitals during this crisis.

The functionality of the portal is 100 percent based on existing functionality in the Philips Interoperability Solutions (Forcare) software. During the deployment of the portal last week, the core functionality was validated with a couple of existing key customers in The Netherlands.

The portal functionality requires manual upload and download. This choice was made to allow for instant go-live and deployment. Ideally, the hospital EMR, PACS, and lab systems would be electronically connected for automated upload and download or leverage existing health information exchange systems. Such connectivity can be explored at a later stage.

Finally, patient identification is provided by the user registering a patient. In the Dutch setting, the national citizen number (BSN) is used as the key identifier (required by law in The Netherlands). In case no BSN is available (e.g. a patient with foreign nationality), a patient can be registered using an alternative ID.



Privacy

By default, information that is uploaded by the hospital that is transferring a patient is only available to users of that hospital. To allow users of other hospitals to see the uploaded information, the transferring hospital needs to register consent explicitly for the receiving hospital. If the receiving hospital in turn would like to share its information with the transferring hospital, the same rules apply. The receiving hospital is required to register consent for the transferring hospital.

Security

To support a fast go-live, each hospital must register at a minimum two key users in order to use the portal. These key users are allowed to request portal accounts for users from their hospital. When new users are created, a one-time activation link is shared with the users, which allows the users to register themselves. This process includes activating a two-factor authentication using the Google Authenticator or FreeOTP Authenticator apps. After a successful login, the user is identified and authorized for all the functions mentioned above. All user actions, such as the patient queries, uploads, downloads, etc. are logged in an audit file and can be accessed for later inspection and audits by designated staff (e.g. security and privacy officers).

Emergency Access

In cases where time is critical a "break-the-glass" function is available to "force" access to a patient's medical records bypassing the consent-based access control. A user using this function is required to enter the reason why access is needed. This is logged via the audit logs.

Technology

The COVID-19 portal runs on the latest Philips Interoperability Solution software stack (our standard software) and is configured for use as described above. The COVID-19 portal is currently hosted in a data center operated by a Dutch Service Provider (Intermax Rotterdam) that is already used for offering the XDSCloud service to Dutch Philips/Forcare customers. This data center is ISO 27001, ISO 20000, ISO 9001, ISO 14001, and ISAE 3402 type II (incl. SOC2) certified. It specializes in providing services to healthcare related organizations, offers georedundant services, and redundant network connection with the Amsterdam Internet Exchange (AMS-IX) for high-speed internet access.

Legal Implications

For other countries that are part of the EU there is an option of hosting a localized COVID-19 portal in the Dutch data center under the GDPR regulation. For countries outside the EU this may not be possible. As each country has its own regulations concerning privacy protections and patient consent further exploration is required to define whether the current COVID-19 portal consent policies apply to other geographies.

Ways the Project Leverages IHE Products and Processes

The COVID-19 portal is based on the Philips Interoperability Platform (formerly known as Forcare) and deployed as an IHE XDS affinity domain/community according to the concepts addressed by the Affinity Domain Whitepaper and the Security and Privacy Whitepaper.

Ways the Project Leverages IHE Test Tools and Testing Processes

The Philips Interoperability Platform (formerly known as Forcare) underlying the COVID-19 portal is tested and validated annually at the IHE-Europe Connectathon.

IHE Profiles Implemented

The COVID-19 portal is based on the Philips Interoperability Platform (formerly known as Forcare) and deployed as an IHE XDS affinity domain/community and uses the following IHE profiles:

- XDS, XDS-I, XDS-MS, XD*-Lab
- XCA, XCA-I
- CT
- ATNA
- PIX/PDQ (v2, v3, FHIR)
- BPPC

- IUA, XUA (including purpose of use)
- MHD (FHIR)

Implementation Challenges

Many deployment projects concerns around privacy and security need to be addressed. In this project, given the little time available, we could address these concerns quickly using the security, privacy, and access control concepts that are underlying to the XDS and related profiles.

References and Publications

== Zorgvisie

COVID-19 Portaal maakt einde aan DVD's met patiëntinformatie

Source: <https://www.zorgvisie.nl/vrijwel-alle-ziekenhuizen-wisselen-digitaal-patientinformatie-uit-via-landelijk-portaal/>

== NU.nl

COVID-19-portaal moet uitwisseling patiëntgegevens makkelijker maken

Source: <https://www.nu.nl/tech/6044884/covid-19-portaal-moet-uitwisseling-patientgegevens-makkelijker-maken.html>

== NRC:

Covid-19-portaal moet informatie-uitwisseling patiënten vereenvoudigen

Source: <https://www.nrc.nl/nieuws/2020/04/14/coronablog-15-april-a3996769#upd20200415080002>

== Health&ICT :

COVID-19 PORTAAL VERSIMPELT UITWISSELING PATIËNTGEGEVENS

Source: <https://www.icthealth.nl/nieuws/covid-19-portaal-versimpelt-uitwisseling-patientgegevens/>

== SmartHealth:

Landelijk online portaal voor uitwisselen COVID-19 patiëntgegevens

Source: <https://www.smarthealth.nl/ehealth-mhealth-newsroom-week-16-2020>

== security.nl:

COVID-19 portaal moet helpen bij uitwisseling gegevens coronapatiënten

Source: <https://www.security.nl/posting/652472/COVID-19+portaal+moet+helpen+bij+uitwisseling+gegevens+coronapati%C3%ABnten>

Description of Submitting Organization(s)

Philips Interoperability Solutions (formerly Forcare) understands the challenges you face in today's complex healthcare environment and we have made it our mission to help you address them. Our goal is to streamline your workflow and improve care collaboration by enabling smooth data exchange across healthcare players. Philips Interoperability Solutions have helped numerous healthcare enterprises and health systems create connected suites of information systems that create, manage and share clinical information—driving efficiency and ultimately enhancing the quality of care.

Royal Philips (NYSE: PHG, AEX: PHIA) is a leading health technology company focused on improving people's health and enabling better outcomes across the health continuum from healthy living and prevention, to diagnosis, treatment and home care. Philips leverages advanced technology and deep clinical and consumer insights to deliver integrated solutions. Headquartered in the Netherlands, the company is a leader in diagnostic imaging, image-guided therapy, patient monitoring and health informatics, as well as in consumer health and home care. Philips generated 2019 sales of EUR 19.5 billion and employs approximately 80,000 employees with sales and services in more than 100 countries.