

MEDIM
hub



MedimHub proposal

Medical Imaging Hub



lets integrate medical images all over the world by connecting patients and physicians in every single point of universe and make it easier for the whole healthcare system in treatment process.

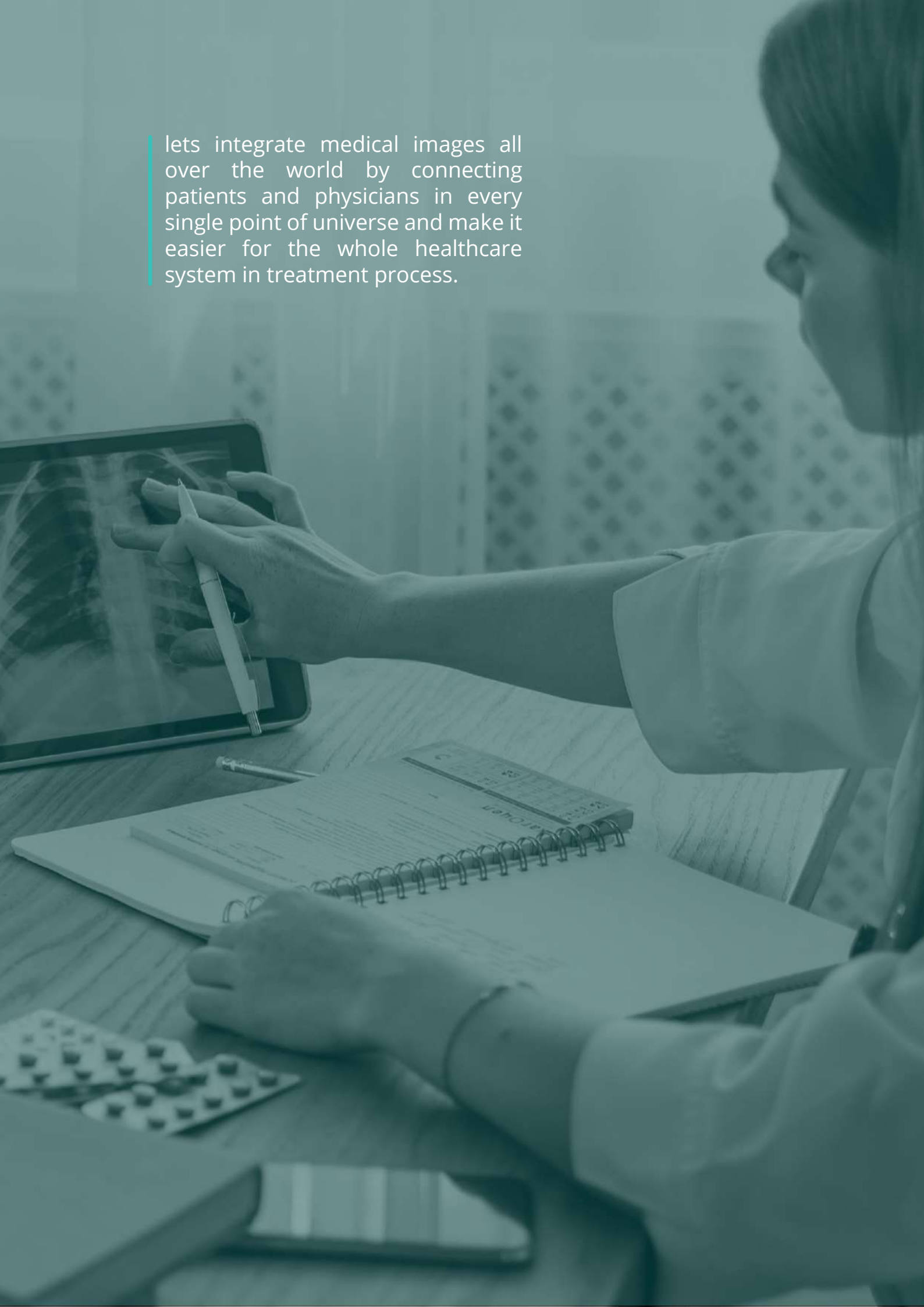
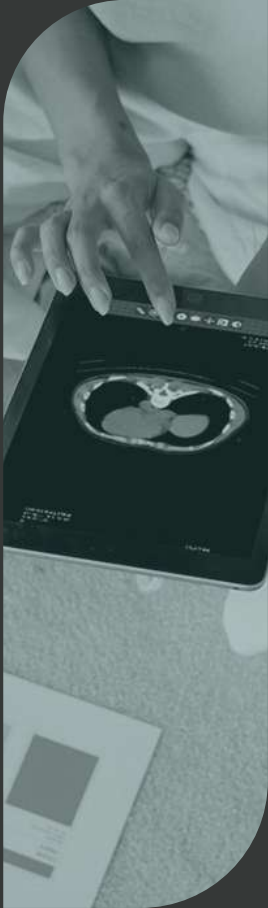


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The quick pitch



Medimhub is a federated-base system providing medical imaging access to patients, physicians, and medical centers with exclusive digitalized services for all these three groups.

We live in the era of mobile technology. Our devices are becoming smarter, lighter, and most importantly, more affordable. Unfortunately, the healthcare industry is notoriously slow to adopt new technology.

Many healthcare institutions have adopted a cloud-based Picture Archiving and Communication System (PACS) for internal storage, but they have yet to utilize this resource for sharing images with patients. They cling to physical films or CDs. But this method is costing them thousands of dollars and will soon be completely obsolete.

Current Challenges in Medical Imaging Industry

The question is, how much are films necessary in the medical process?

The film is used for acquiring, processing, and displaying radiographic images but are they reliable for treatment procedures? Is their quality high enough to help patients experience a safe treatment? Doesn't their quality reduce over time? Are we going to have these challenges in the future?



No need to mention how films can be suffering in the patient's treatment process. Films are vulnerable and can be lost in the treatment process, especially in long-term treatment processes. Films can be scratched, damaged by chemicals or heat, and damaged by prolonged exposure to the sun. they get dry and brittle in low humidity and also can be burned.

On the other hand, CDs require expensive materials, labor, and precious time. They are limited by their capacity and portability.

Newer computers don't even have disc drives, making it impossible to even open images stored on a CD. physicians can't even count the number of patients who forget to bring their CDs to their appointments.

CD exchange means a lack of immediate access. A doctor will not have immediate, point-of-care access to images and reports with a CD.

CD burner manufacturers are all different and sometimes CDs don't work on the clinician's equipment. Of any kind of these accidents, patients have to go through the whole process again — request, wait, travel to the hospital for pick up and possibly pay an additional fee.

Now there is a big unanswered question. What do patients do when they tend to go abroad for medical purposes? Are they comfortable with carrying films or they are trying to seek a second opinion or go for further consultations without the hassle of carrying around that huge x-ray From one city to another city or also from one country to another?

According to the Medical Tourism Association, about 14 million people in the world travel to other countries in search of medical care annually.

In the age where patients have immediate access on their smartphones to everything from their finances to their home security system, waiting 3-5 business days (at minimum) to receive a CD or film in the mail doesn't cut it.

On the other hand, we know There are some points in digital DICOM images which are invisible in traditional films and can cause mistakes in a physician's diagnosis.

Physicians will miss increased dynamic range, linear response of images, and availability of post-processing functions in DICOM images while using poor spatial resolution in films.

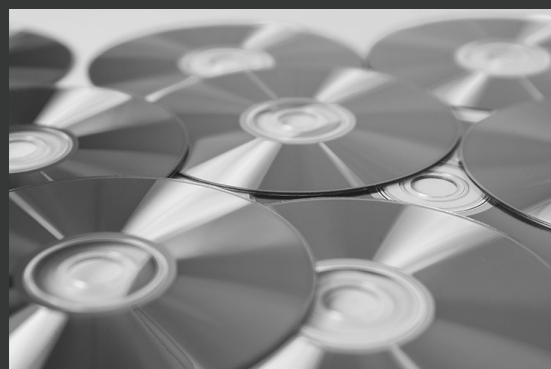
Medical institutes will ruin their budgets in the way of purchasing boxes of films and CDs, printing devices, and also maintenance or repair fees.

According to the World Health Organization (WHO), an estimated 3.6 billion diagnostic imaging examinations are performed each year globally.

So we admit 3.6 billion films, CDs, or both to the environment annually.

the plastic materials are seen to biodegrade, they only break down into microplastics which remain in the soil for a long period, thereby reducing soil nutrients and stunting plants' growth.

Yes, we also know that people's x-ray scan films are what they hold dear to themselves and may not want the prying eyes of others to see.



Products

Sharing health data is totally complicated, difficult to execute, and highly sensitive and personal. We are here to make these data accessible for wider use and answer challenges.

When it comes to health care, there is a need to improve health outcomes through digitalization and data can only be achieved with improved access to data across institutions and jurisdictions.

As a solution, a federated approach – where data sets are accessed remotely without movement of data from its secure location of origin – could be set up and run sustainably across countries with clear governance optimizing for operational efficiency, patient privacy, and data security.



MedimHub



MedimHub is a service that can be set on PACS (Picture Archiving and Communication System) in medical imaging centers like a new button providing the ability to build patient and physician profiles automatically in all federated networks and put their medical images in their own profile. Patients and physicians can view, share and download their DICOM medical images in a safe way in the MedimHub system and facilitate their treatment path.

The network is scalable and accessible to future partners and presents opportunities for continued growth as a hub. The first step is to make sure you have a PACS in place for your organization's medical image management.



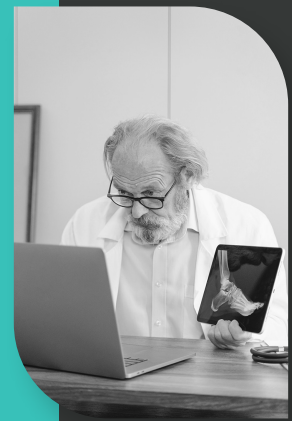
MedimHub believes every patient should have online qualified access to their DICOM medical images immediately after they did the process of medical imaging or download them at any time and everywhere in the world.

It should be possible for them to share their medical images with everyone in the world in a safe way on their own account, where they can archive all their images irrespective of which medical center has done the process. So in the case of medical travel they know there is no need to carry any physical images and there are no damaging threats. After years if they need their medical images they can easily have them in their special account. No threats of losing them.

We shouldn't leave physicians with trashy films or papers and vulnerable CDs that can bother them in treatment.

It should be comfortable for them to have a relaxed diagnosis process and easily receive patients' medical images with reports which have been assigned from different medical centers. They should be free to observe every patient's image in their special accounts with the highest quality and a lot of facilities on the internet. This way they will get rid of low-quality films and the process of receiving CDs, putting them in the computer and not being able to open the files.

It's also easy to archive and allows medical practitioners to quickly consult with each other even when they are miles apart, for doctors to be more mobile and faster in making a diagnosis.



Medical imaging centers are supposed to change their submission of medical images process including film and CD ergo they won't worry about their budget relating to submitting medical images to the patients, printing devices, and also maintenance or repair fees.

You can cut expenses on film, chemicals, and vulnerable CDs which are destroying your budget and frustrating your human resources in the way of printing and writing them.

Let MedimHub do all the process of automatically giving medical images to the patients and referring physicians. You're pretty much killing two birds with one stone and saving money as a result.

As a web-based system, your patients and their referring physicians can do all of this from their smartphone, laptop, or any device with an internet browser. Patients can have access to their images forever, eliminating any need for an additional copy of their CD or duplicate scans causing unnecessary radiation exposure.



Medix/FHIR

The next step is to make sure your PACS system executes FHIR/MEDIX standard which contains necessary federated-base APIs to manage connection of PACS system to Medim service or any other medical imaging portal systems, generalizing technical features and APIs that together promote reusability and data availability for multiple applications using the rules of federated networks in which a number of separate networks or locations share resources (such as network services and gateways) via a central management framework that enforces consistent configuration and policies. Management, control, and data planes are distributed over multiple networks or locations and managed as a single entity.

Notice that a DICOMweb protocol merely cant comply all the function of system. Medix protocol allows for streamlined operations, as an administrator can set policies for the entire federated network, rather than applying them to each network separately, creating a uniform environment across all sites. The system (HUB) and all Nudes can execute as a user or a provider.

It also helps support simplified disaster recovery, with networking and security policies and compliance that are maintained during a network failover, or when a workload is migrated between different locations.



FHIR/Medix, a federated network protocol, provides the consistency, interoperability, and access controls needed to deploy and enforce networking and security policies across multiple networks. As business pressures demand app modernization and faster time to market, a lack of integration across data centers can create visibility gaps and configuration inefficiencies that make management of networking and security policies time-consuming and prone to errors. Federated networks support these business-critical initiatives by providing consistent and efficient policy deployment and enforcement across various administration domains or multiple sites within a single administrative domain.

Makes a connection with Medical imaging centers through Picture Archiving and Communication System (PACS)

Allows the PACS system to generate a special code (Medis code=medical Study code) and send the patient's medical images to their accounts.

Allows the PACS system to send the patients' medical images with their Medis code to the referring physician's account..

Allows the users including patients and physicians to enjoy helpful features of the accounts.

AFRA



In case a medical imaging center couldn't comply with the APIs reported in Medix protocol and couldn't find its way to connect to the MedimHub platform we can suggest to use AFRA device as an adaptor.

AFRA is a small smart hardware suitable for any medical imaging center that will connect to the PACS system easily containing all the Medix APIs.

- A small product (hardware module)
- Accessibility to the patients' records in DICOM format
- Easy maintenance without the need for IT specialists
- High security and virus resistance
- Easy access to medical images and patient records
- Ability to view images
- High-speed display of ultrasound images due to the reduction of image size and without loss of quality
- The average amount of storage, according to the size of the images and the daily admission of imaging centers
- Development capability

Safety

Medical imaging centers on the way of encountering all challenges, try to eliminate films and CDs and use online options in which one of the most important reasons that get them back to films and CDs was SAFETY.

The Health Insurance Portability and Accountability Act of 1996 (HIPAA) was introduced to simplify the administration of healthcare, eliminate wastage, prevent healthcare fraud, and ensure employees could maintain healthcare coverage between jobs. Since its passage, Standards have been introduced to improve patients' rights and safeguard Protected Health Information (PHI).

Medim carefully considers all parts of this standard and GDPR rules and doesn't allow to happen any kind of violations like:

- Impermissible disclosures of PHI
- Improper disposal of PHI
- Failure to conduct a risk analysis
- Failure to manage risks to the confidentiality, integrity, and availability of PHI
- Failure to implement safeguards to ensure the confidentiality, integrity, and availability of PHI
- Failure to maintain and monitor PHI access logs
- Failure to enter into a HIPAA-compliant Business Associate Agreement with prior to sharing PHI
- Failure to provide patients with an accounting of disclosures on request
- Failure to implement access controls to limit who can view PHI
- Failure to terminate access rights to PHI when no longer required
- Unauthorized release of PHI to individuals not authorized to receive the information
- Sharing of PHI online or via social media without permission
- Mishandling PHI
- Texting unencrypted PHI
- Failure to encrypt PHI or use an alternative, equivalent measure to prevent unauthorized access/disclosure



Patients should have the ability to control their images in a special profile. The patient is the one who allows others to review their images and reports. On the other hand, the one who challenges others' authority over the images.

As the system has a federated-base protocol, all the informations are under the control of the medical imaging centers' managements. unlike the Centralized cloud-base system in which medical centers must move, save and cache their information from their secure server to a centralized server, there is no need to move any information from its origin place.

The Medis code is unique and under the regulation of international standards.

Although Centers generally maintain responsibility for their data, can be assured the correct PACS data will be shared correctly.

There is a complicated algorithm while generating Medis code for patients. no way to guess someone's Medis code to be abused.



Co-operation



You want to run a portal system for your medical imaging center? Or you are thinking about connecting the whole governmental body?

There are some groups can collaborate with Medimhub. If you are in any kind of these groups, together we can start a powerful, safe and structured system in which a lot of people can benefit:

Medical Imaging Centers

All of the costs of films and CD packages, the extra process that you have in the way of printing films and writing CDs, the extra human recourse who print films or write CDs, the extra cost you waste because of purchasing printers, writers, and the maintenance fee, can be summarized in a couple of clicks.

Image management software and storage solutions paired with faster, stronger internet service can now handle large, complex files like medical images in DICOM format. These files can be shared without printing film or shipping a CD. Medical centers can cut expenses on film, chemicals, and vulnerable CDs which are destroying their budget and frustrating their human resources in the way of printing and writing them.

AI & Health Institutes

Any institutions that try to integrate the whole medical informaiions or AI solutins around a country, group of countries or around the world and build a unique portal system.

You can count on Medimhub in Medical Imaging part of the whole system

Government and Insurance Institutions

Storing CDs long-term involves a host of concerns. In addition to the physical space and care they require, CDs are also subject to safety hazards. Storage safety concerns range from fires, natural disasters, theft, and innocuous scratches from improper handling. Compounded are the factors of filing and organization, which in themselves take time.

With this kind of service, there is no need to allocate any physical spaces to keep medical imaging records specially in insurance institutions and it will reduce the expenses of cleaning up the environment by government.

In the long term, it helps citizens economically to forget the process of going back and forth within the city or outside the city to receive reports of their medical images or consultation with different physicians.



Contact Us



www.medimhub.com



info@medimhub.com



+44 7748299577