



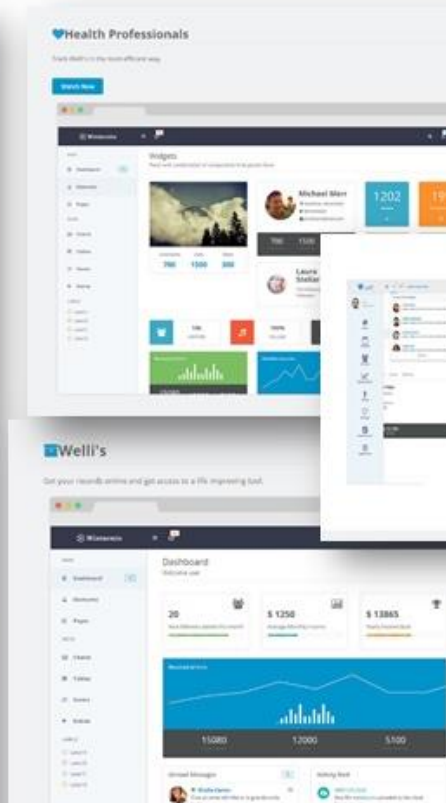
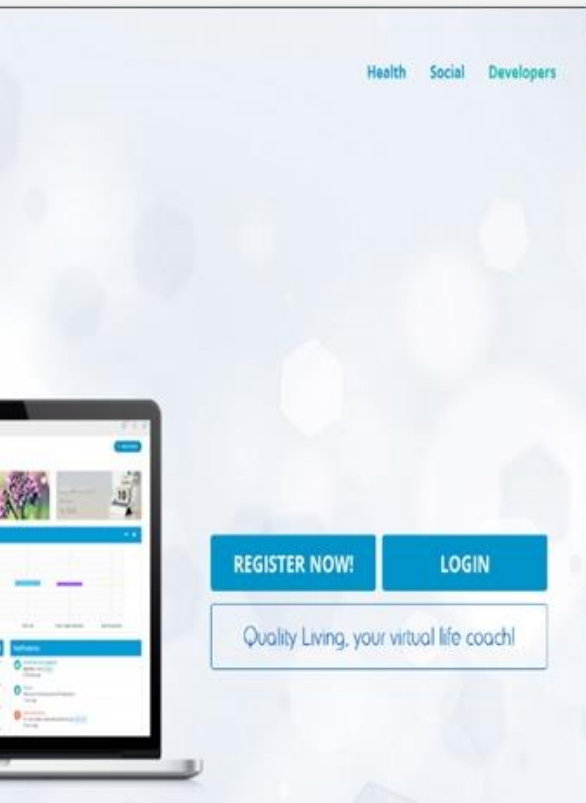
Smarter Heterogeneous Data Sets - SHDS

Papadopoulos Homer

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F4Fp-06

Athens, 15-10-2019



Smarter Heterogeneous Data Sets - SHDS

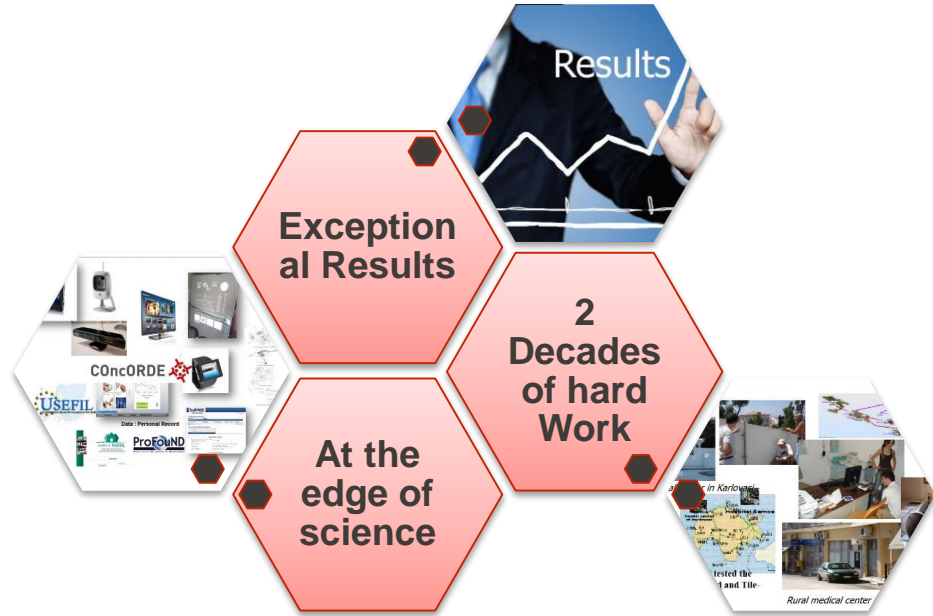
BIG DATA MANAGEMENT FOR HEALTHCARE SYSTEMS

The Intelligent ehealth and wellness Platform

Experiment Description

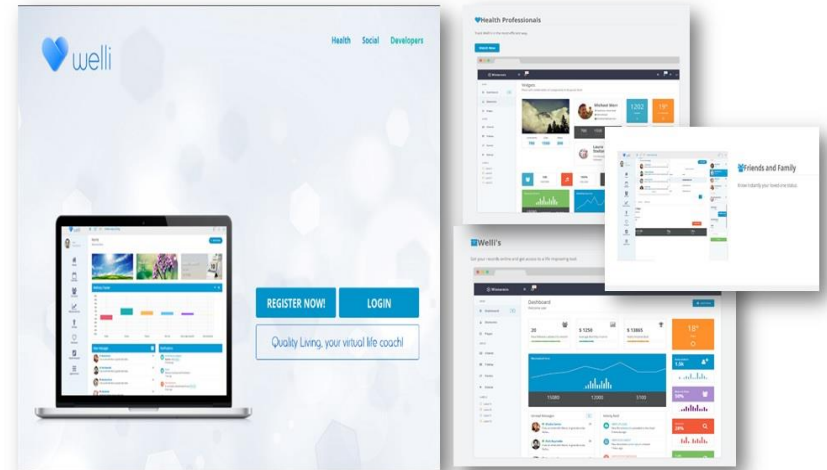


Background and Motivation



Syndesis Ltd – a Spin Of company of NCSR D

www.iWelli.com



The Intelligent health and wellness Platform



Experiment Description

BACKGROUND AND MOTIVATION

The growing amount of data in healthcare industry:

- Electronic Health records (medical history, claims and billing, doctors notes etc)
- genomic sequencers
- devices such as MRIs, x-rays and ultrasounds
- sensors and wearables for patients
- medical equipment telemetry
- mobile applications

has made inevitable the adoption of big data management techniques in order to improve the quality of healthcare delivery.

Experiment Description

Concept

The med.iwelli.com platform is enabling doctors to store, analyse and manage Big Heterogeneous Data.

The overall aim of the SHDS project is to get value out of all the heterogeneous content we store in the med.iwelli.com platform.

This will allow us to generate intelligent services and to facilitate cooperation between different actors (doctors, patients, carers).

Specific Objectives:

Obj1. Leverage Tengu cloud-based platform functionalities and apply smart data aggregation and cloud storage federation model on the stored content developing automated intelligent services.

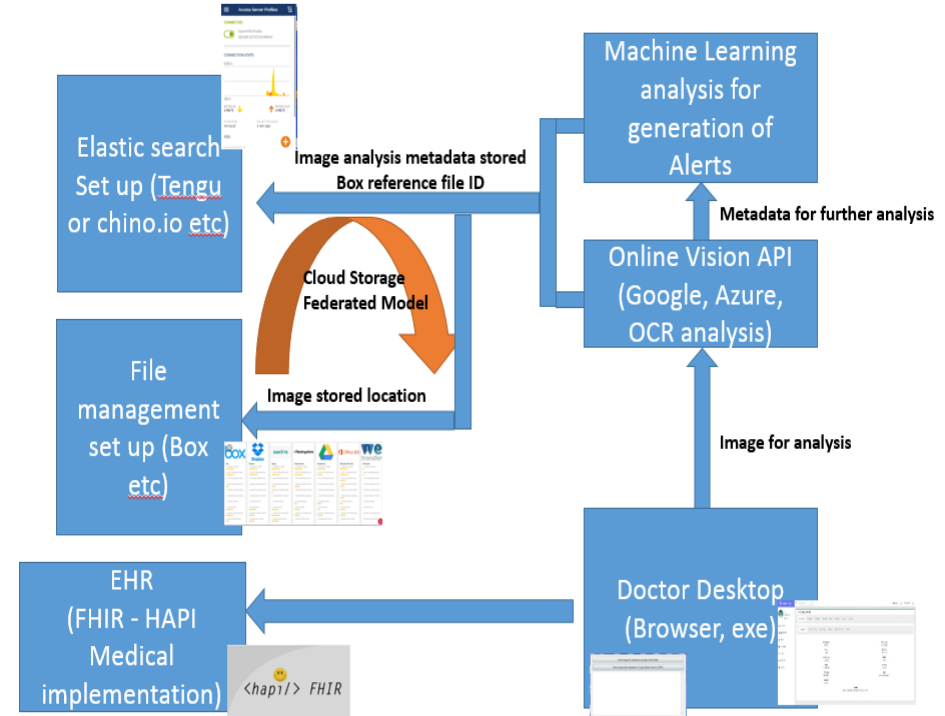
Obj2. Automate the service that will apply optical character recognition (OCR) to the documents stored in the Tengu platform, decoupling the management of file metadata and data.

Obj3. Automate the service that will apply image recognition and relevant generation of alerts to the stored diagnostic images like MRI images to the Tengu platform.

Experiment Description

Our Architecture:

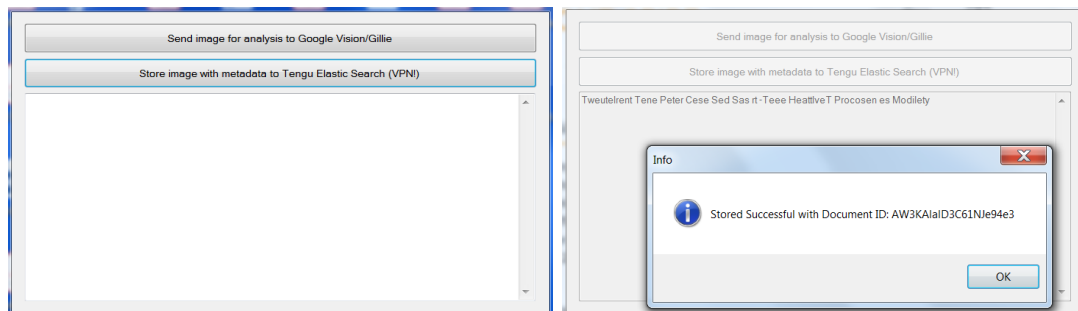
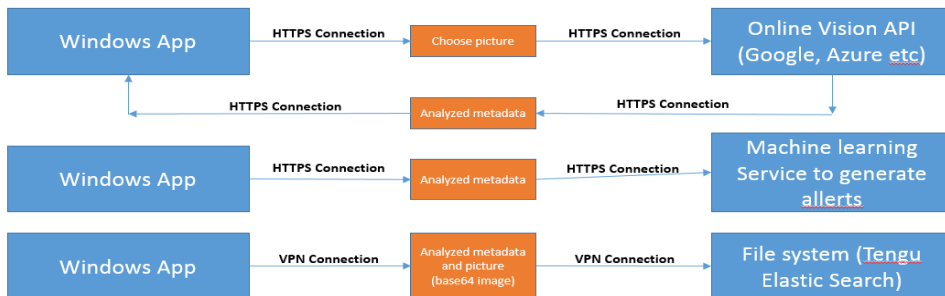
We adopt a cloud storage federation model integrating multiple cloud storage providers into a single virtual storage pool, improving data availability, storage scalability and data processing performance.



Experiment Description

SET UP IN FED4FIRE (TENGU PLATFORM)

Windows Application



☰
Access Server Profiles +

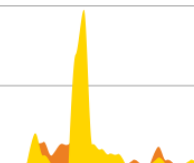
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OpenVPN Profile

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CONNECTION STATS

67B/s



0B/s

BYTES IN

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BYTES OUT

0 KB/S ↑

DURATION

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PACKET RECEIVED

2 sec ago

YOU

YOUR PRIVATE IP +



SHDS - Business Impact and Feedback

Business Impact

BUSINESS IMPACT ON SYNDESIS

Med.iwelli.com competitive advantage over the competition of traditional EHRs:

- Offer online machine learning capabilities to med.iwelli.com platform
- Automate the digitalization of all forms of files and images stored in the platform
- Allow doctors intelligently manage their unstructured data in the cloud.
- From Big data to smart data

The experiment will allow us to test methods to automate the digitalization and creation of metadata of all data forms (images, documents).

The produced metadata will be accessible from applications generating useful intelligent services of diagnosis and prevention.

FeedBack



USED RESOURCES AND TOOLS

We are conducting experiments with a cluster formed by 3 nodes with settings:

1. Tengu Platform (2 nodes):

Elasticsearch: 10.10.139.....,

MySQL: 10.10.139.....,

Routing Server (Operating System: Windows Server 2019 Standard, CPU: Intel Xeon E5-2687W v2 Ivy Bridge-EP 3.4 GHz LGA 2011, RAM: 32G, HDD:250GB SSD)

File Servers (Operating System: Windows Server 2019 Standard, CPU: Intel Xeon E5-2687W v2 Ivy Bridge-EP 3.4 GHz LGA 2011 (Or equivalent), RAM: 32G, HDD:1Tb)

2. File Management system node.

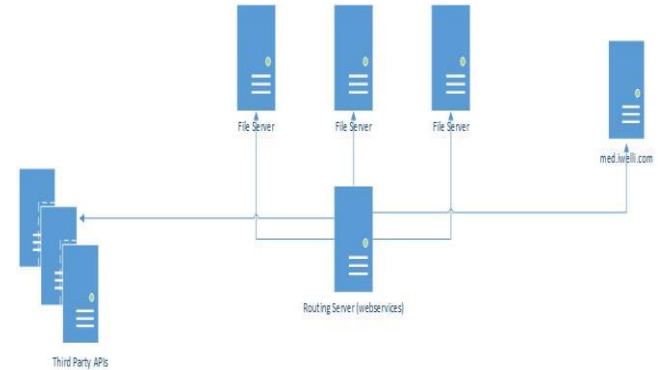
The storage service is our main storage file management system where all files (Images,PDFs, ECGs) are secured stored into this platform that is a cloud content management and file sharing service.

Storage size: 10Gb

Max file size:250mb

3.med.iwelli.com node: Open Source EHR where we host the medical patient data in HL7 - FHIR format which are loaded into as a JSON documents

Happi server: configured with an Intel CORE™ i7-4770 processor (3.40GHZ, 1 Cores, 1GB RAM, Linux).



FeedBack

VALUE ADDED FROM FED4FIRE

Low cost (free) environment for testing of big data techniques and models using standardised technologies.

It allows us to experiment with different models in real test bed without worrying about creating the backend infrastructure. This allows us to identify the best model.

For the first phase (simple experiment) the learning process seems to be easy. Still to check on a more complex experiment (phase 2).

After the experiment it would be helpful Fed4Fire to:

- become a low cost ease of use platform to support the scalability of our services providing us with necessary tools eg. security tools.
- low the barriers for SMEs to set up and experiment with big data technologies



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WWW.FED4FIRE.EU