Welcome to

# WORKSHOP THREE:

## HOLISTIC HEALTHCARE WITHIN DYNAMIC INFORMATION INFRASTRUCTURES - THE CLOUD BASED eHEALTH PLATFORM

Sponsor:

intouch with health

HOLYROOD

# Prof. Bill Buchanan


## Institute for Informatics and Digital Innovations, Edinburgh Napier University

with

## Dr. Lu Fan, Dr. Elias Ekonomou, Prof. Christoph Thuemmler and Owen Lo, from the Institute for Informatics and Digital Innovations Edinburgh Napier University



Sponsor:

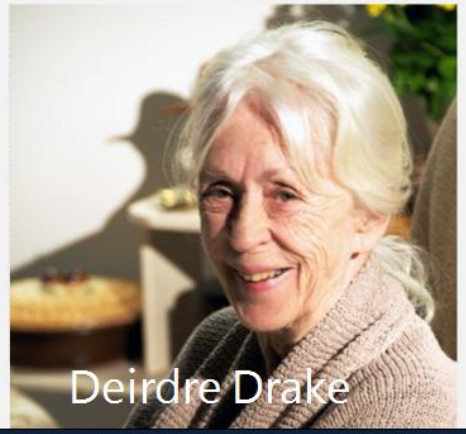
intouch with health

HOLYROOD

# Scenario

## Bill Buchanan

- Role: Family
- Invited user

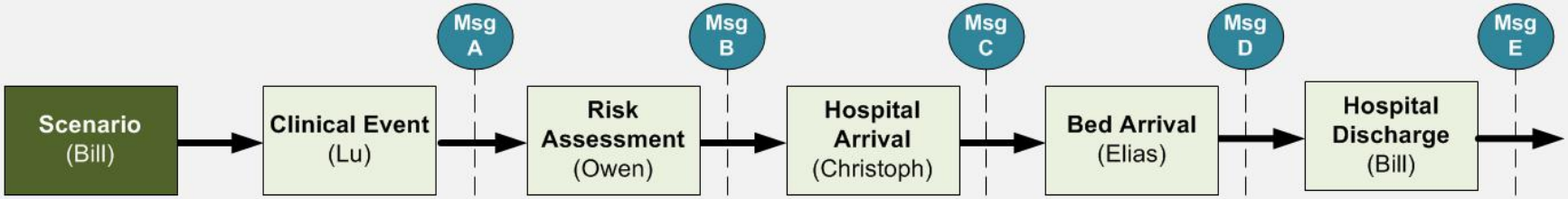



- Care Subject
- 82 years old
- House bound
- COPD (Chronic Obstructive Pulmonary Disease)

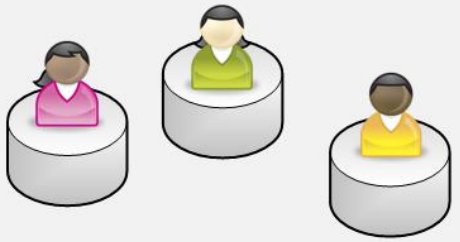
- Role: Ambulance Staff

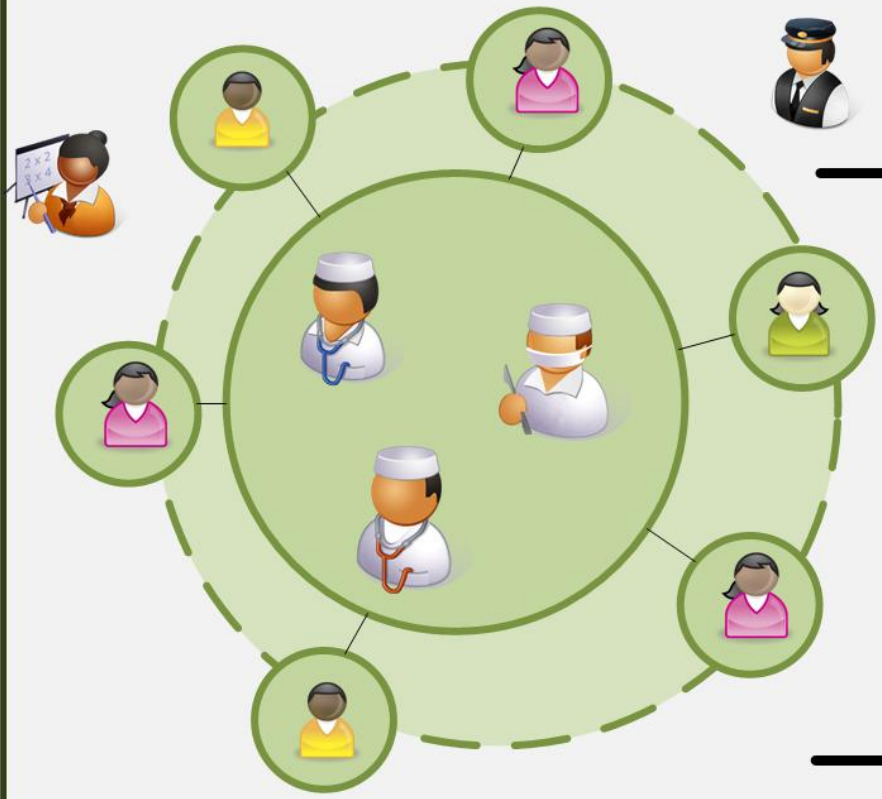
- Role: GP
- GP.
- Invited user

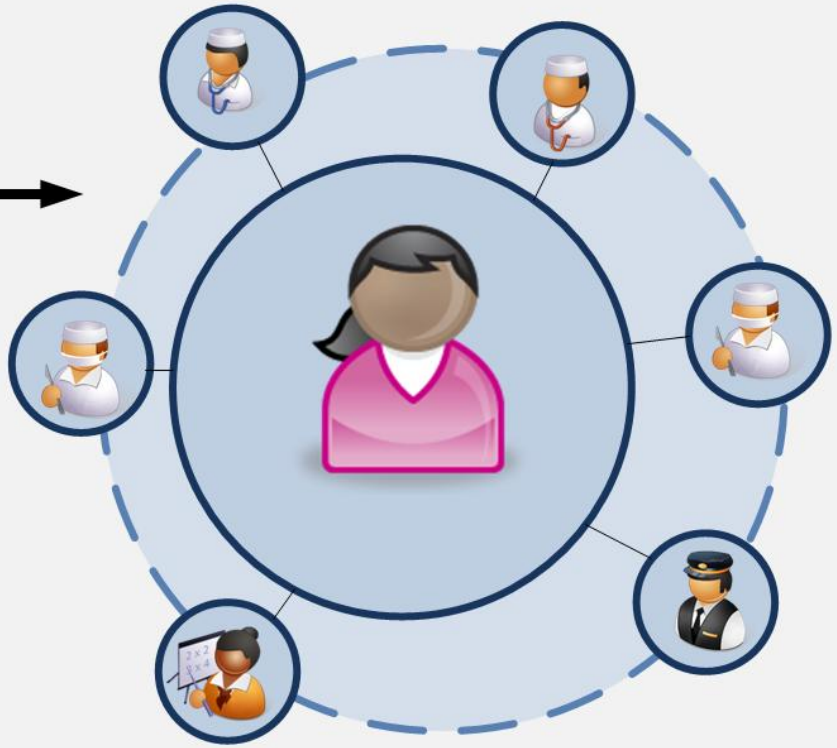
- Role: Clinical Staff



Industry Age → Information Age





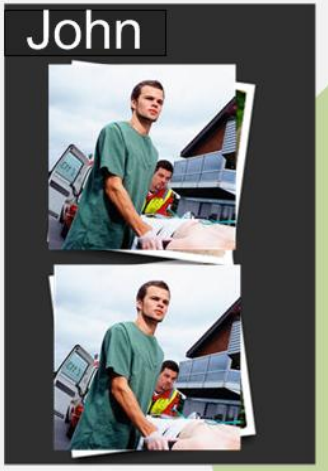


Centralised, Non-integrated,
Ad-hoc, Clinician Focused, Reactive,
Clinician Control of Records

Distributed Patient Care, Holistic,
Patient Focused, Pre-emptive,
More Patient Control of Health

Cloud4health

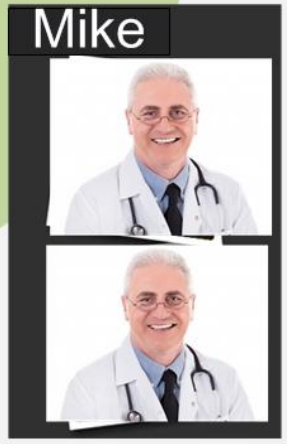
[Ambulance Staff]: Elias



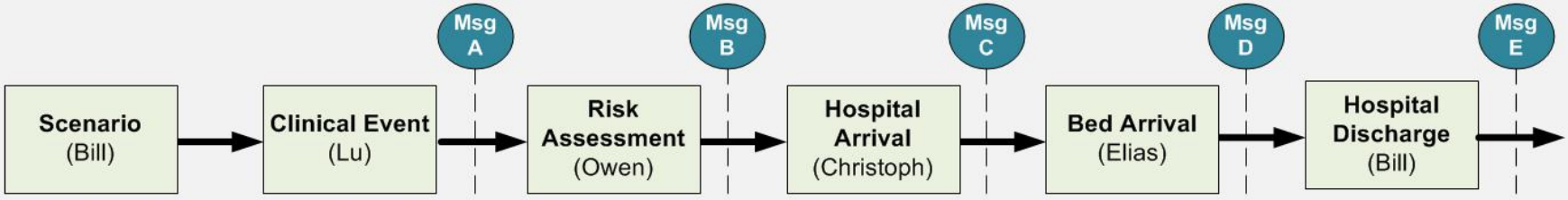
[Deidre]: Owen

[Clinical Staff]: Christoph

[Family]: Lu

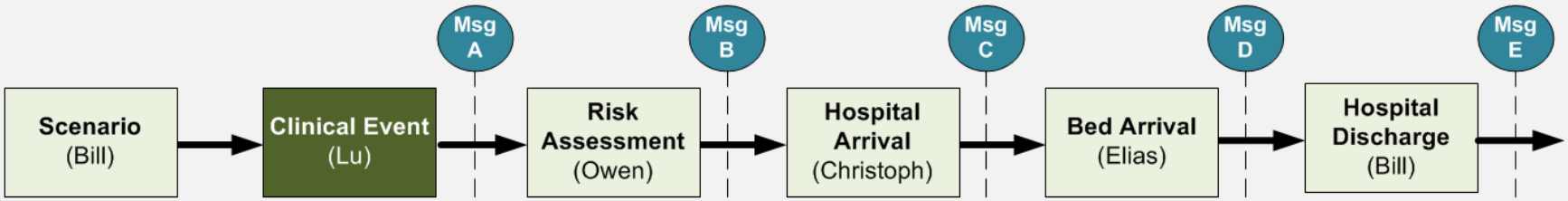



[GP]: Bill

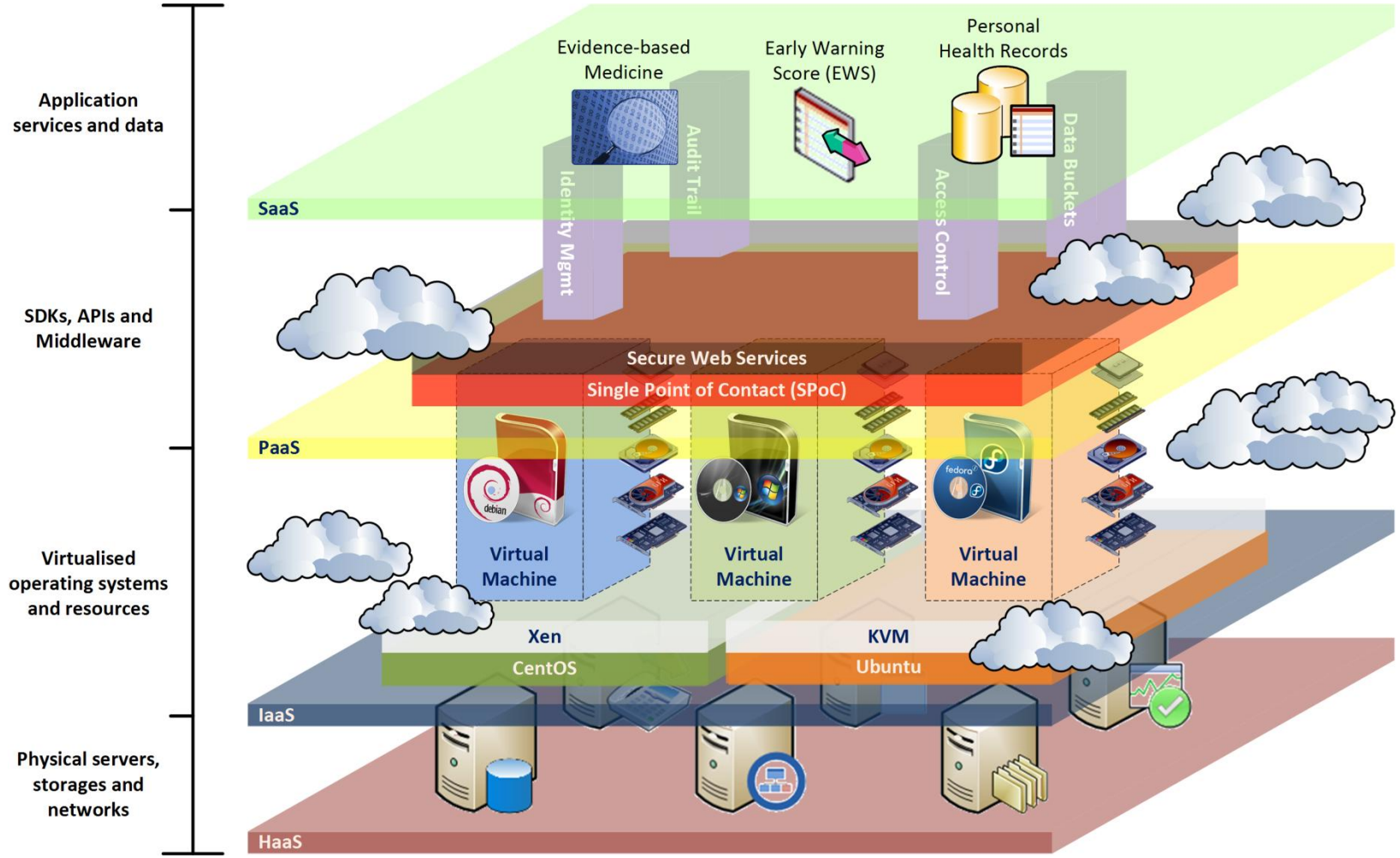


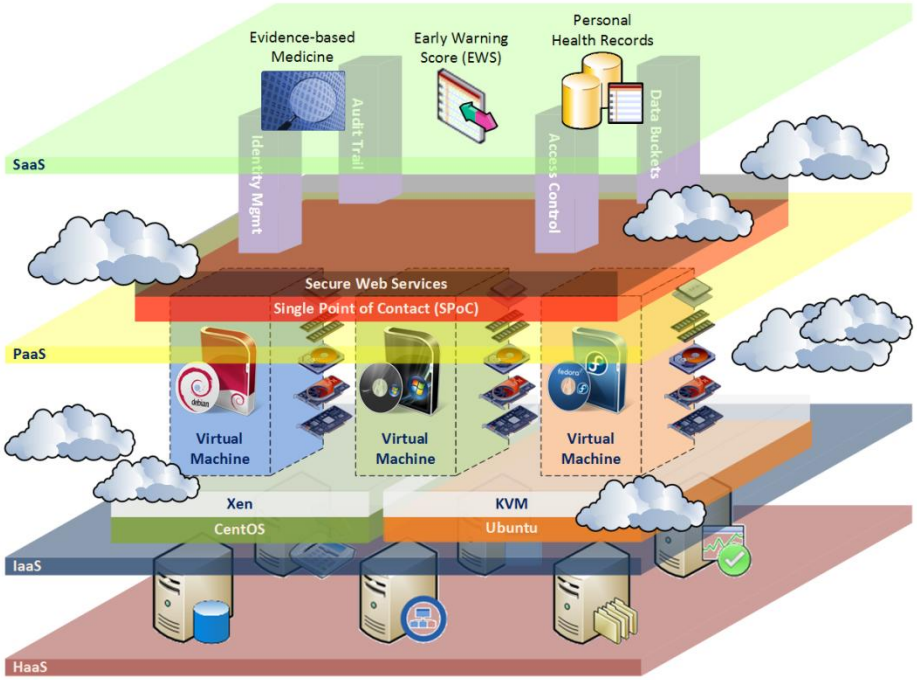
# Clinical Incident

## Lu Fan

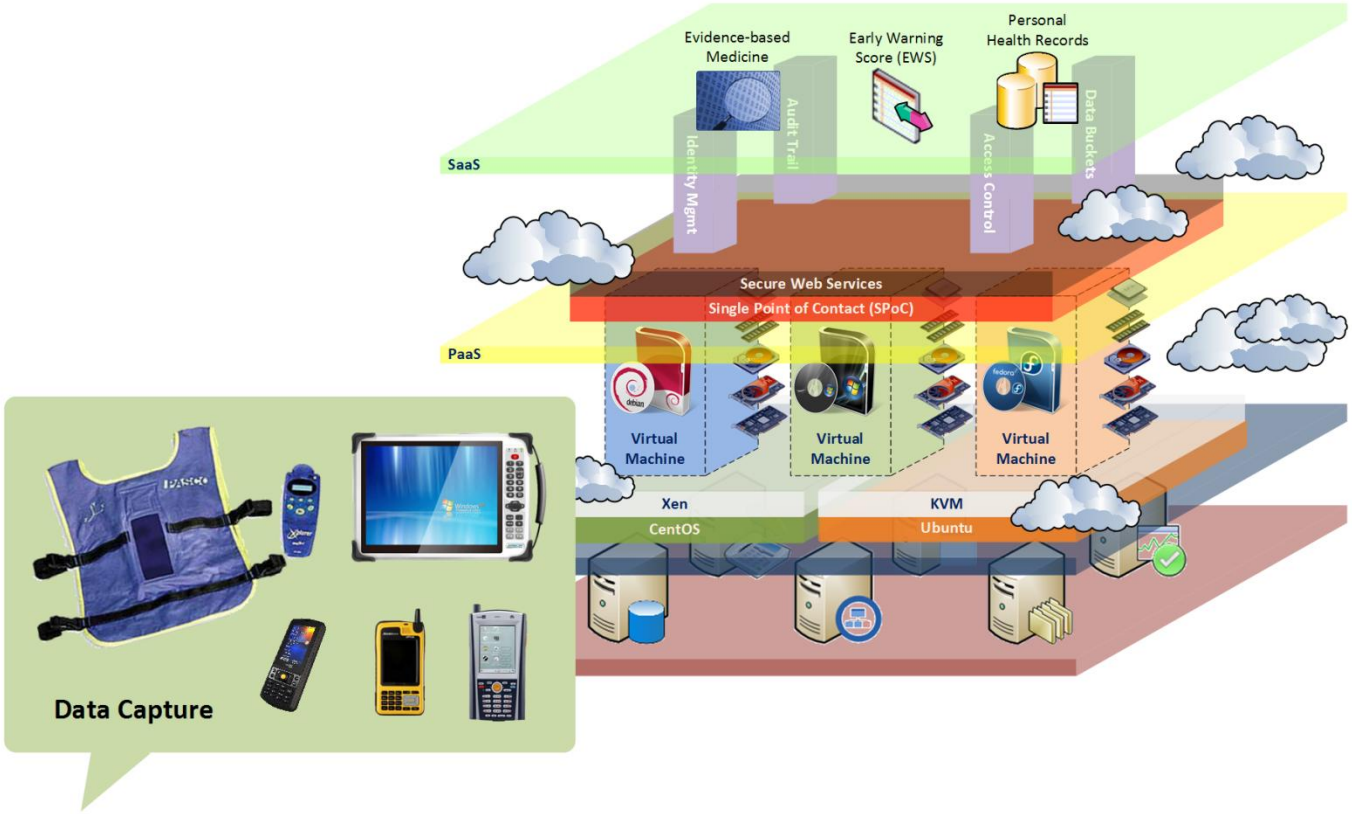


cloud4health

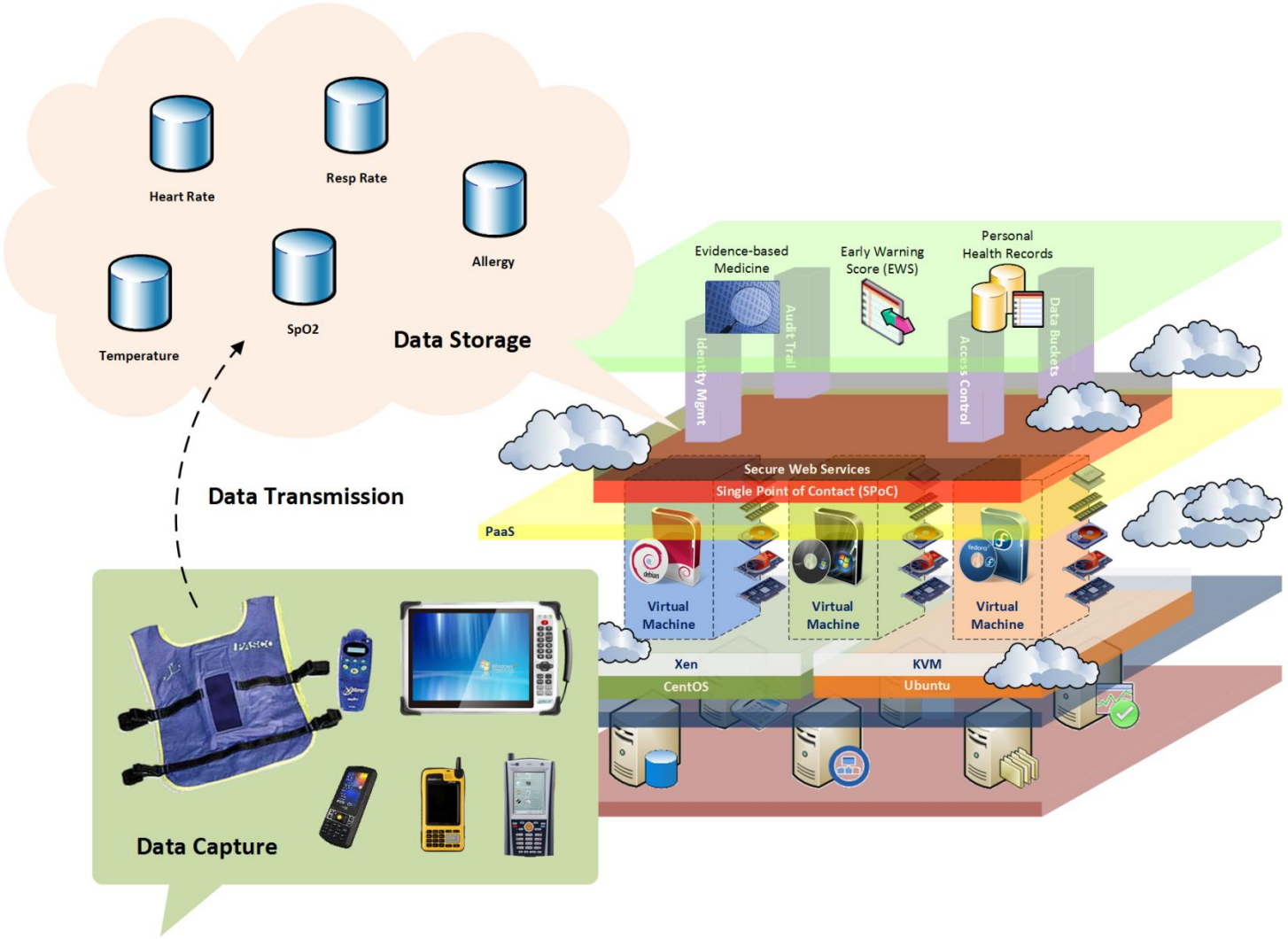



Evidence-based Medicine
Early Warning Score (EWS)
Personal Health Records
Identity Mgmt
Audit Trail
Access Control
Data Buckets
SaaS
Secure Web Services
Single Point of Contact (SPoC)
PaaS
Virtual Machine
Virtual Machine
Virtual Machine
Xen
CentOS
KVM
Ubuntu
IaaS
HaaS

cloud4health



cloud4health



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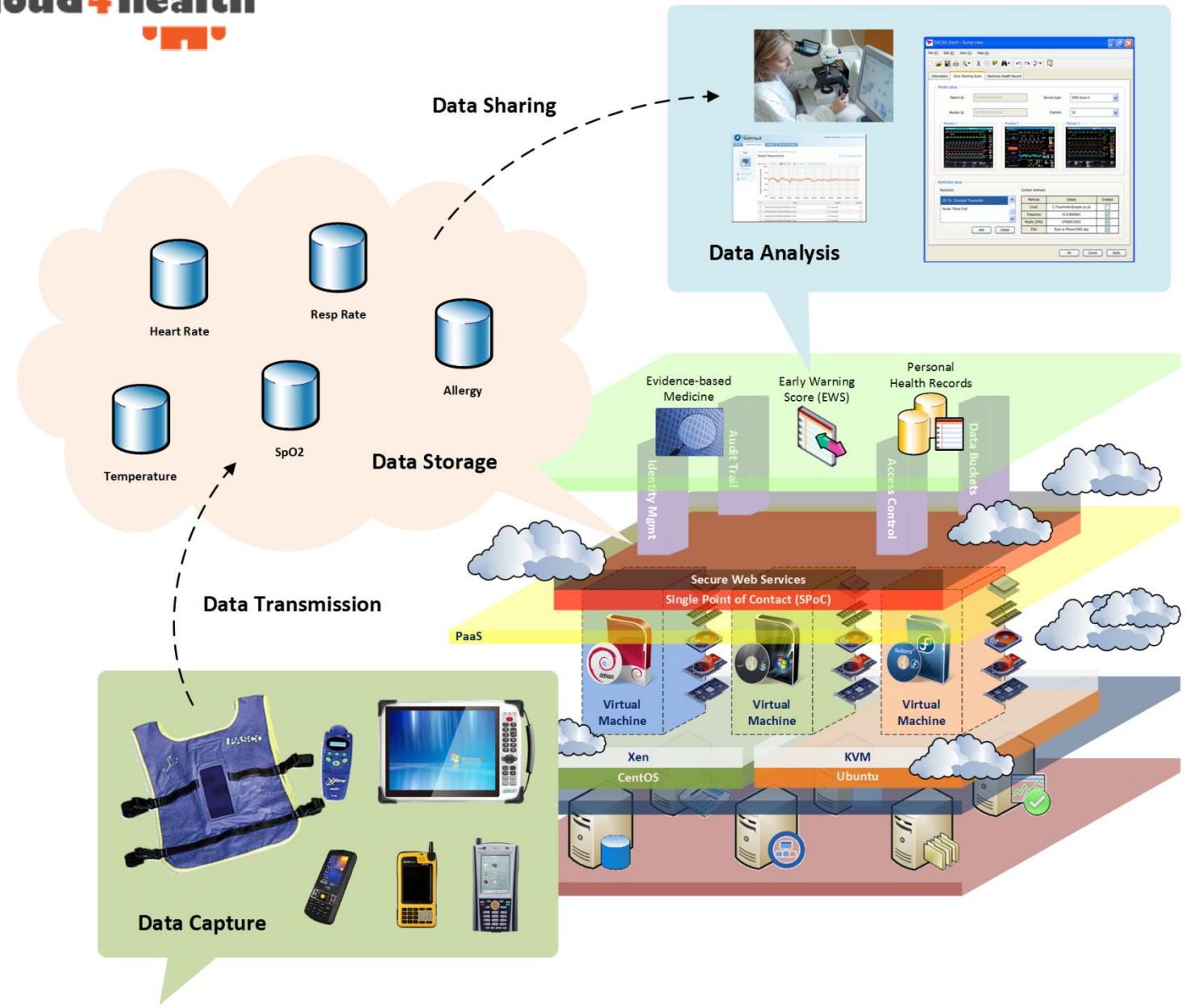
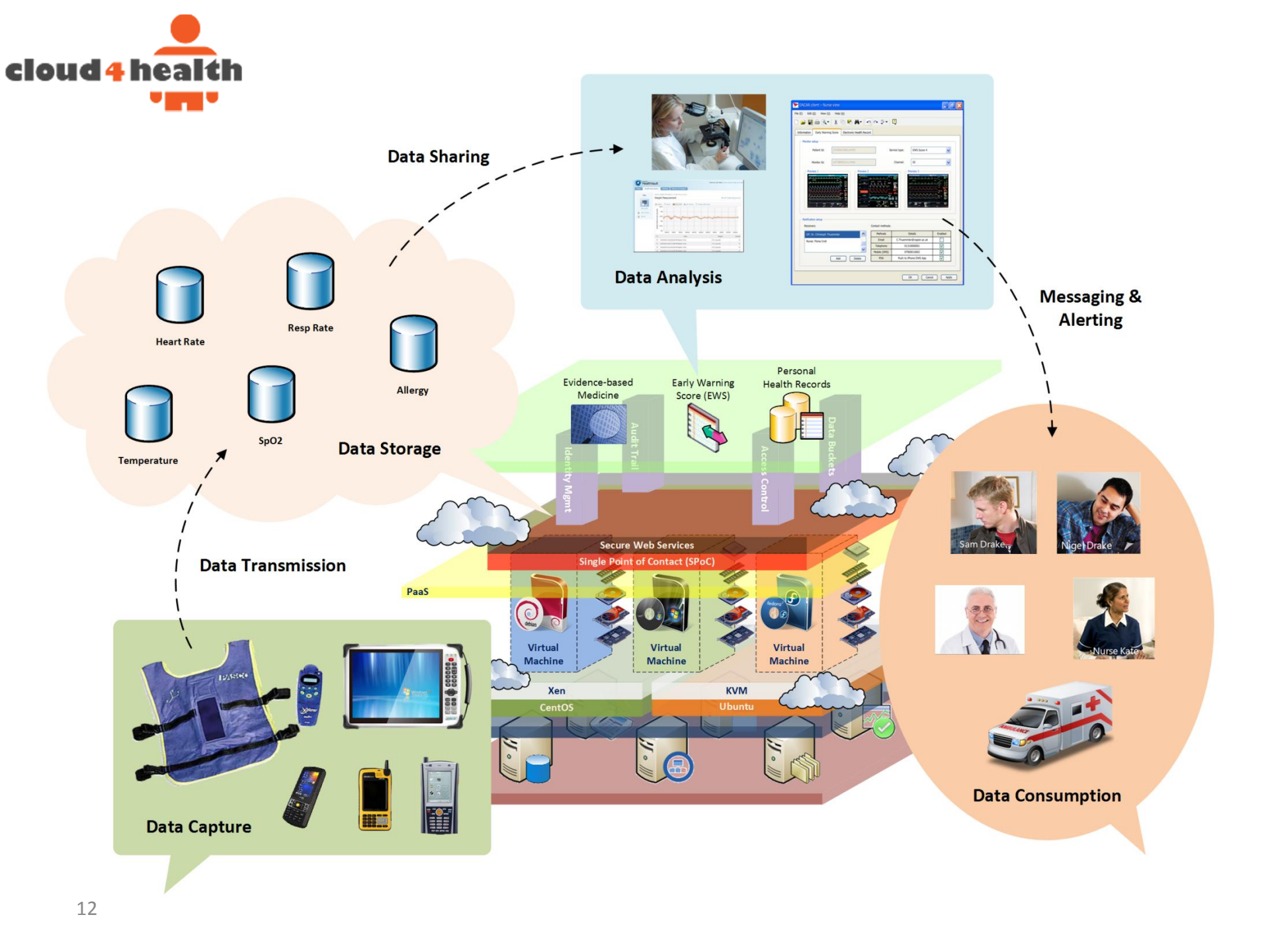
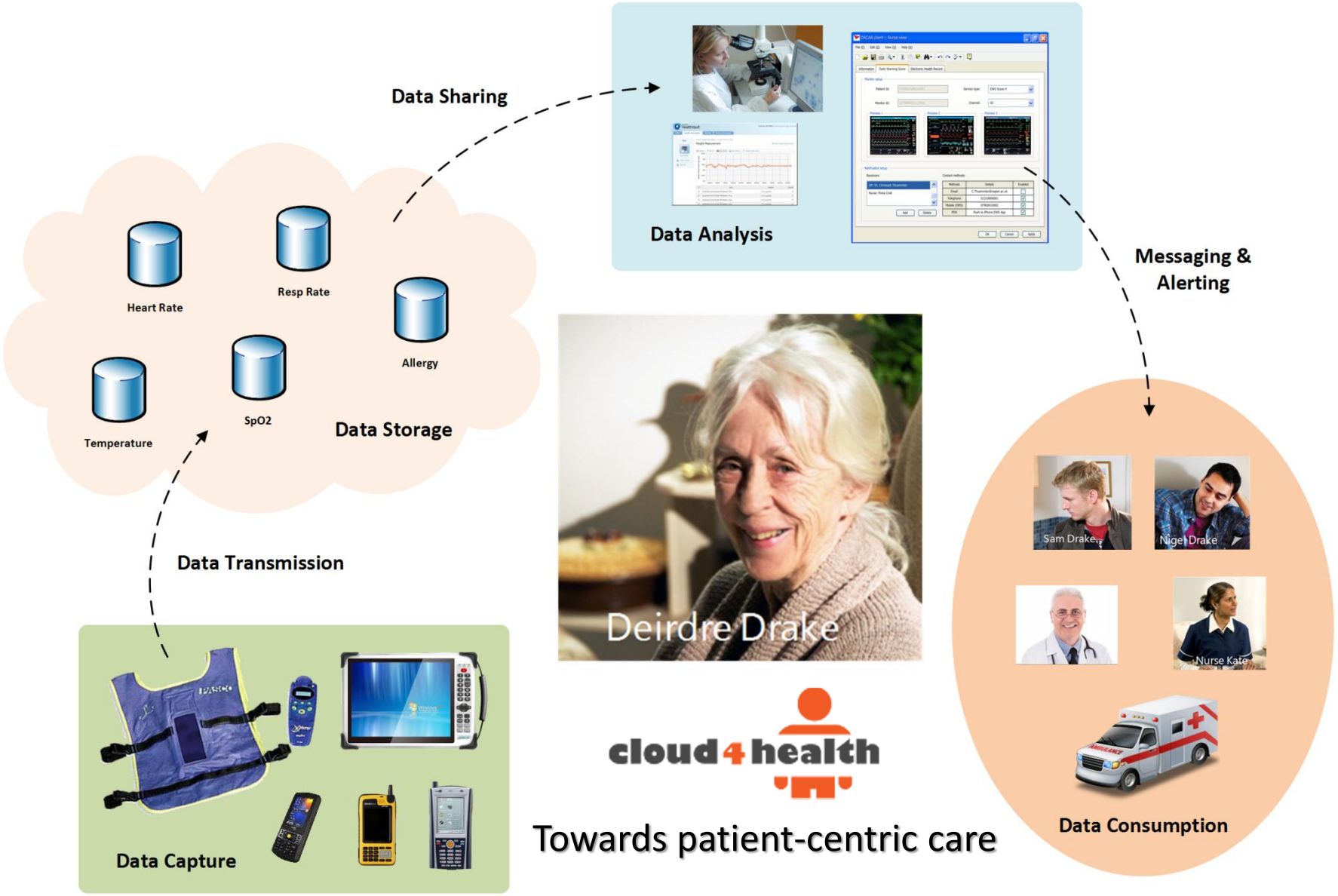



cloud4health
Data Sharing
Data Analysis
Messaging & Alerting
Heart Rate
Resp Rate
Allergy
SpO2
Temperature
Data Storage
Data Transmission
Evidence-based Medicine
Early Warning Score (EWS)
Personal Health Records
Identity Mgmt
Audit Trail
Access Control
Data Buckets
Secure Web Services
Single Point of Contact (SPoC)
PaaS
Virtual Machine
Virtual Machine
Virtual Machine
Xen
CentOS
KVM
Ubuntu
Sam Drake
Nigel Drake
Nurse Kate
Data Capture
Data Consumption


Data Sharing
Heart Rate
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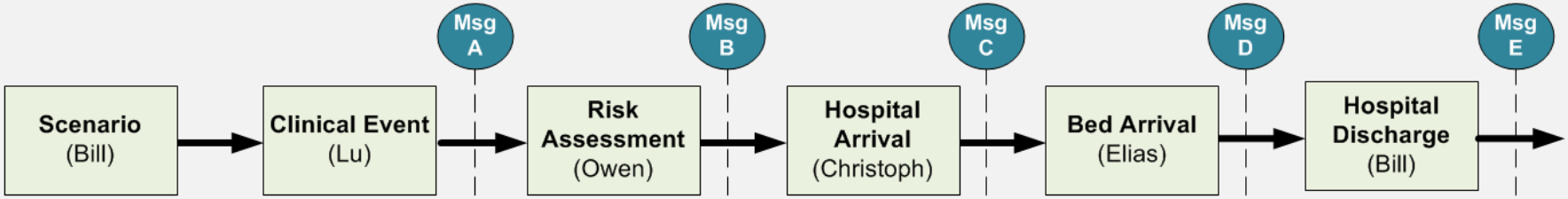
Data Analysis
Messaging & Alerting
Deirdre Drake
Data Transmission
Data Capture
Sam Drake
Nigel Drake
Nurse Kate
Data Consumption
cloud4health
Towards patient-centric care

Deirdre

# Messages


Scenario
(Bill)
Clinical Event
(Lu)
Msg A
Risk Assessment
(Owen)
Msg B
Hospital Arrival
(Christoph)
Msg C
Bed Arrival
(Elias)
Msg D
Hospital Discharge
(Bill)
Msg E

Sam

Welcome to the Cloud4Health Workshop! You have registered successfully as the role of: Family

Mike

Welcome to the Cloud4Health Workshop! You have registered successfully as the role of: GP

Deirdre

Welcome to the Cloud4Health Workshop! You have registered successfully as the role of: Deidre

John

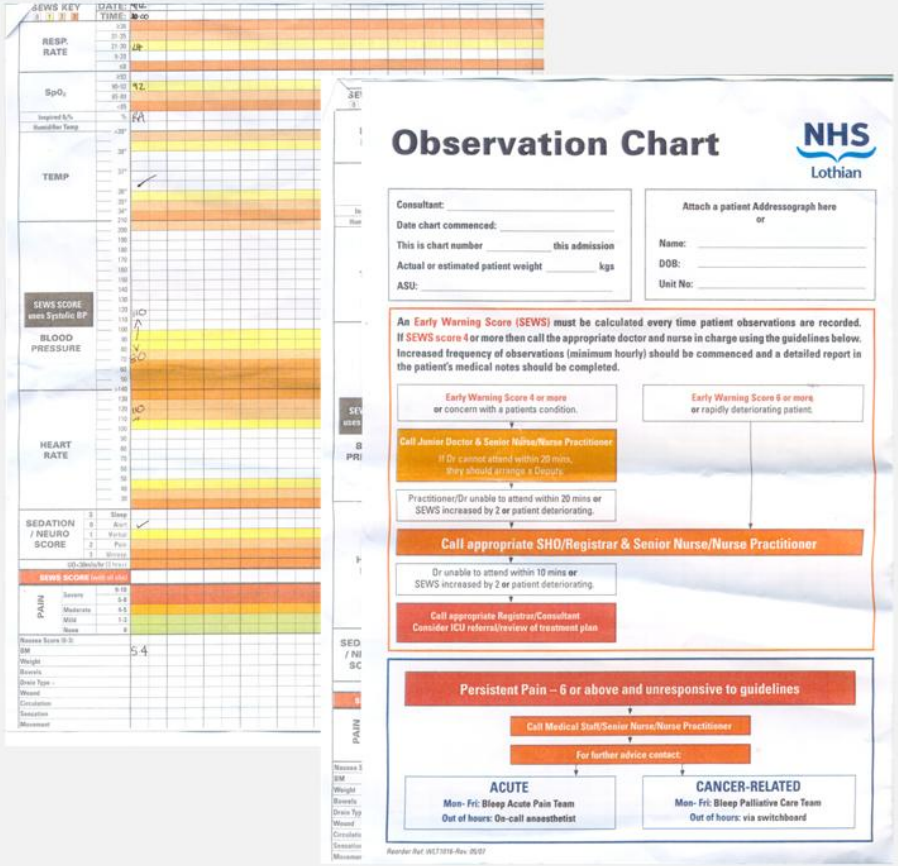
Welcome to the Cloud4Health Workshop! You have registered successfully as the role of: Ambulance

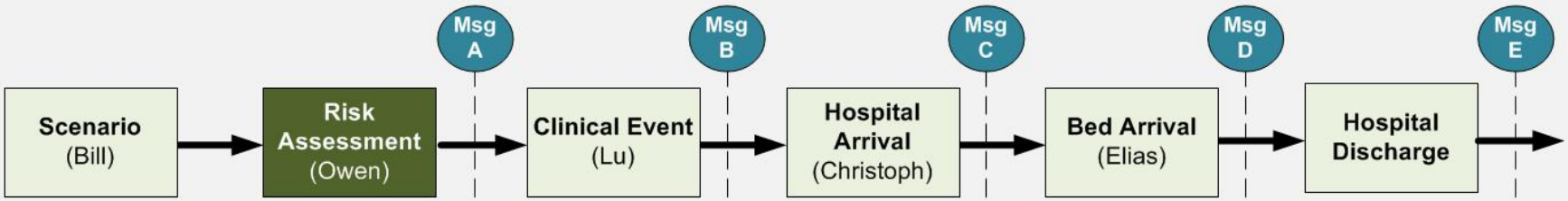
Kate

Welcome to the Cloud4Health Workshop! You have registered successfully as the role of: Clinical

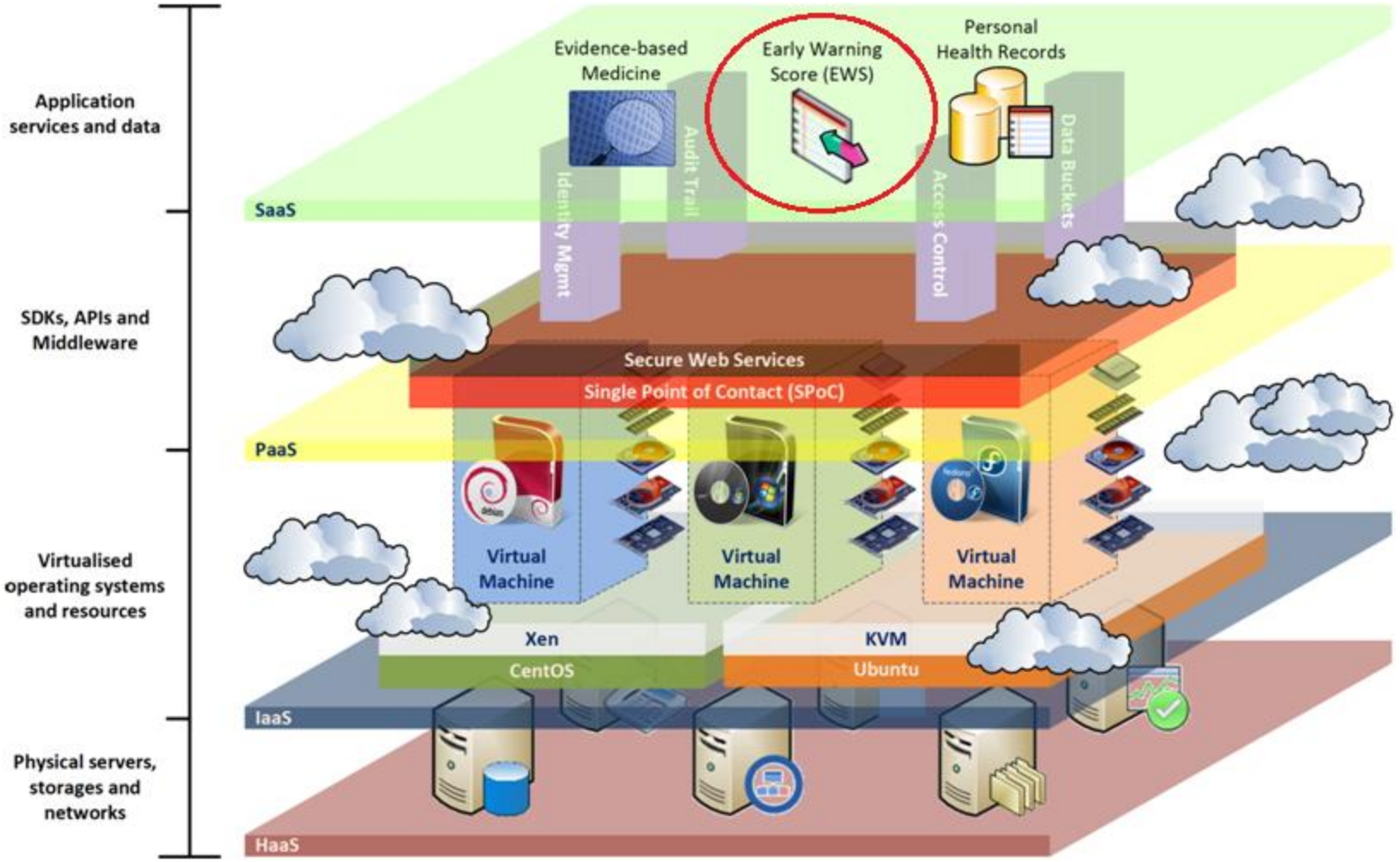
# Risk Assessment

## Owen Lo



# RISK ASSESSMENT VIA E-HEALTH SERVICES



# E-HEALTH SERVICES OVERVIEW

- E-Health services are applications which integrate directly with our e-Health cloud platform.

- E-Health services aim to provide better health care to patient's by simplifying and/or enhancing existing practices within healthcare environments.

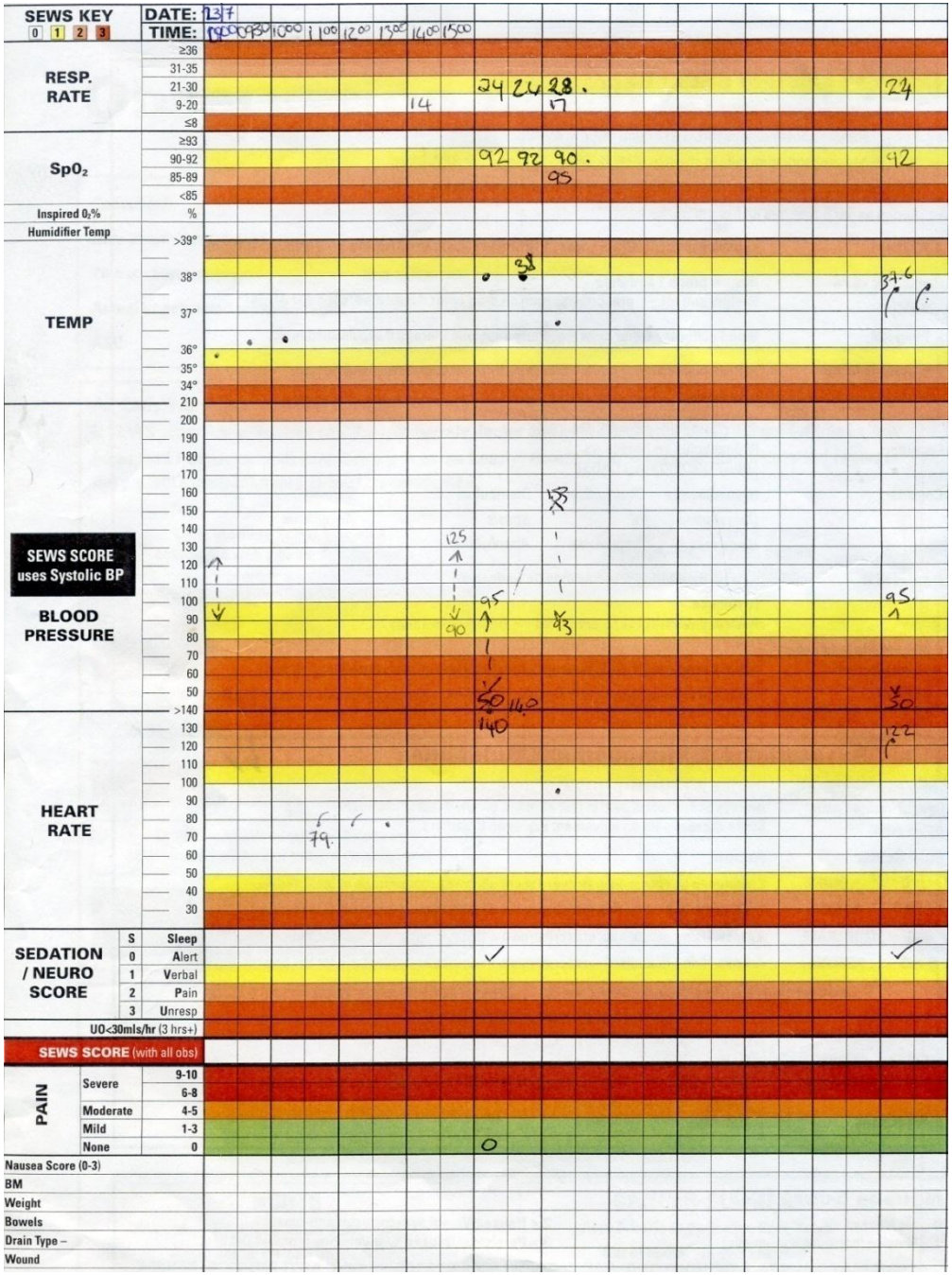
- One example of an e-Health service is a prototype Risk Assessment software referred to as the Early Warning Score Service.

cloud4health

# TRADITIONAL RISK ASSESSMENT

| PHYSIOLOGICAL PARAMETERS | 3 | 2 | 1 | 0 | 1 | 2 | 3 |
|---|---|---|---|---|---|---|---|
| Pulse | ≤40 | | 41 - 50 | 51 - 90 | 91 - 110 | 111 - 130 | ≥131 |
| Temperature | ≤35.0 | | 35.1 - 36.0 | 36.1 - 38.0 | 38.1 - 39.0 | ≥39.1 | |
| Systolic BP | ≤90 | 91 - 100 | 91 - 110 | 111 - 219 | | | ≥220 |
| Respiration Rate | ≤8 | | 9 - 11 | 12 - 20 | | 21 - 24 | ≥25 |
| Consciousness Level | | | | A | | | V, P, or U |
| Oxygen Saturations | ≤91 | 92 - 93 | 94 - 95 | ≥96 | | | |
| Any Supplemental Oxygen | | Yes | | No | | | |

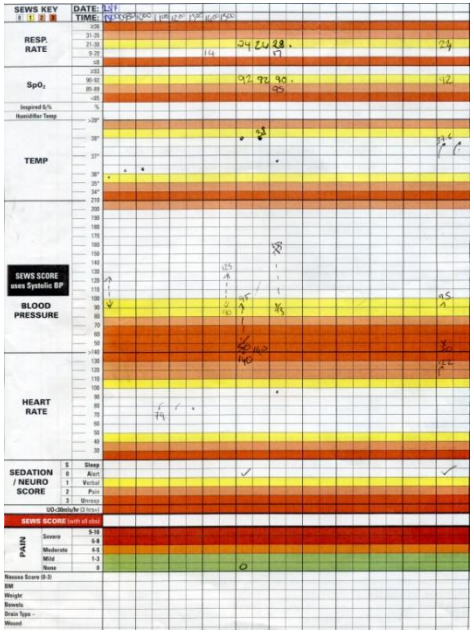
cloud4health

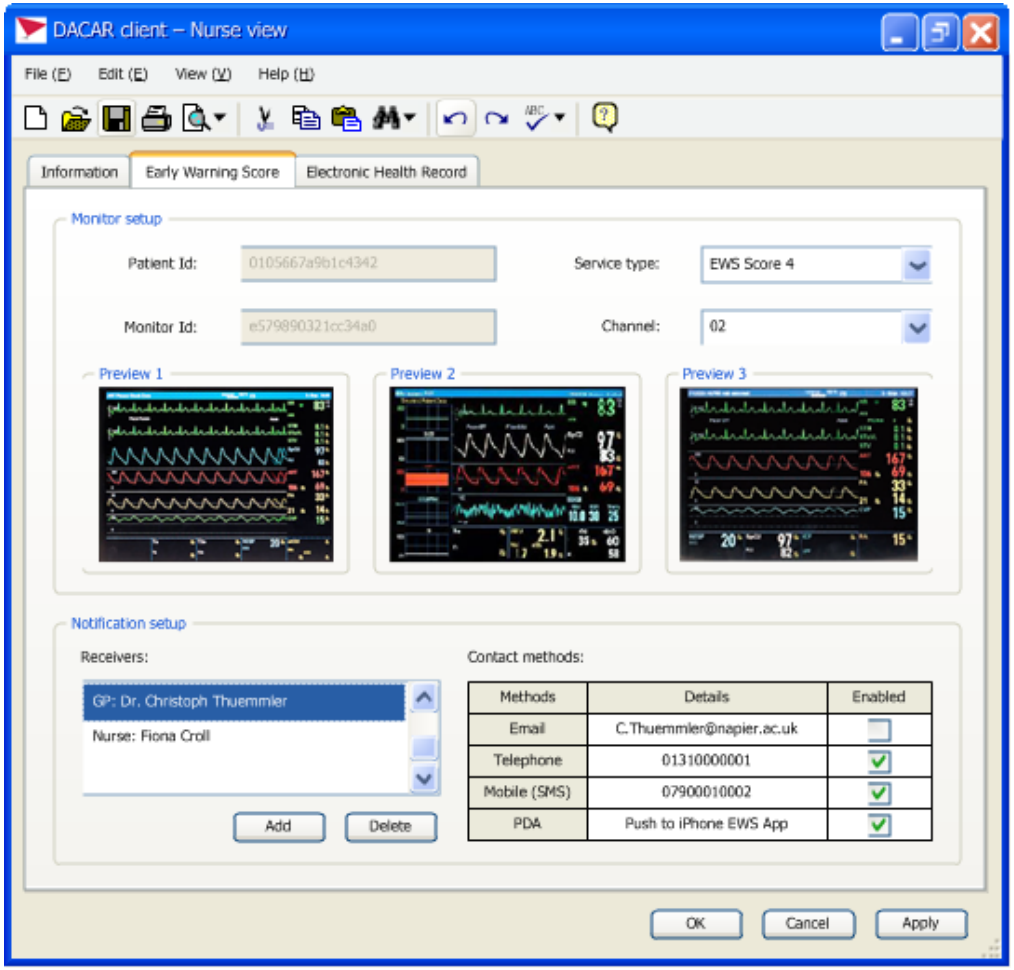


cloud4health

cloud4health

# EWS SERVICE

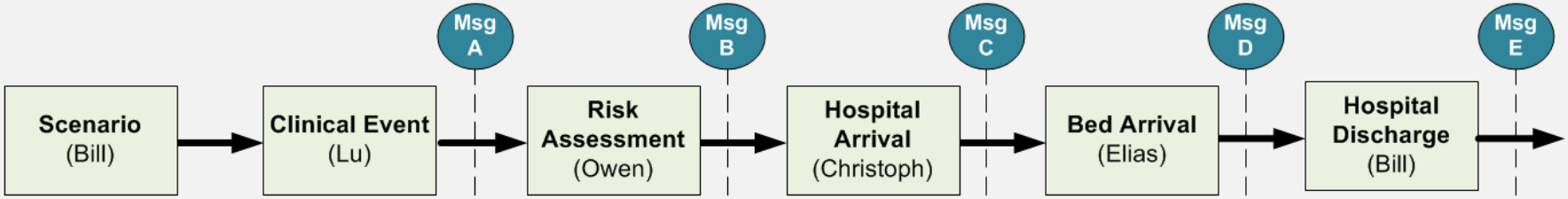


cloud4health

Deirdre

# Messages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Hospital Discharge
(Bill)
Msg E

Deirdre

-95 3G 27.2 - 20:46 - 246MB

Messages **Deidre**

Your ambulance is on its way, and your family has been informed.

John

-100 3G 27.2 - 21:40 - 274MB

Messages **Ambulance**

Patient Deidre
EWS: 6
Clinical Alert: Stroke
Address: 186 Main Street, Edinburgh.

Sam

-96 3G 27.2 - 20:45 - 247MB

Messages **Family**

Your mother is going into hospital.
Address: Royal Infirmary of Edinburgh
Contact: 0131 536 1000

Kate

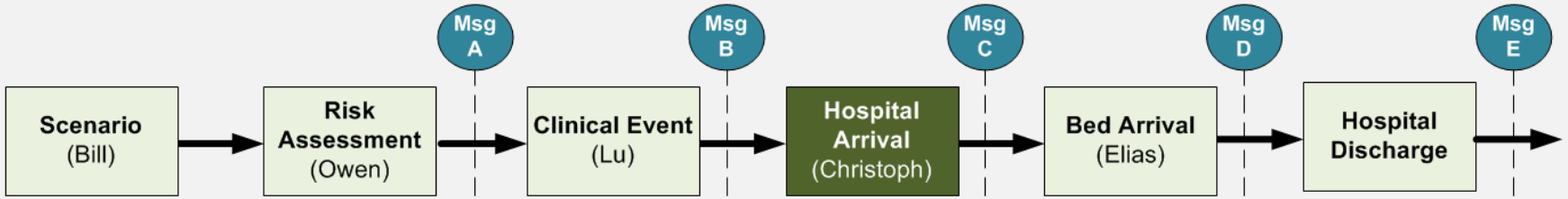
-95 3G 27.2 - 20:46 - 245MB

Messages **Clinical**

Patient Deidre
EWS: 6
Clinical Alert: Stroke
Address: 186 Main Street, Edinburgh.

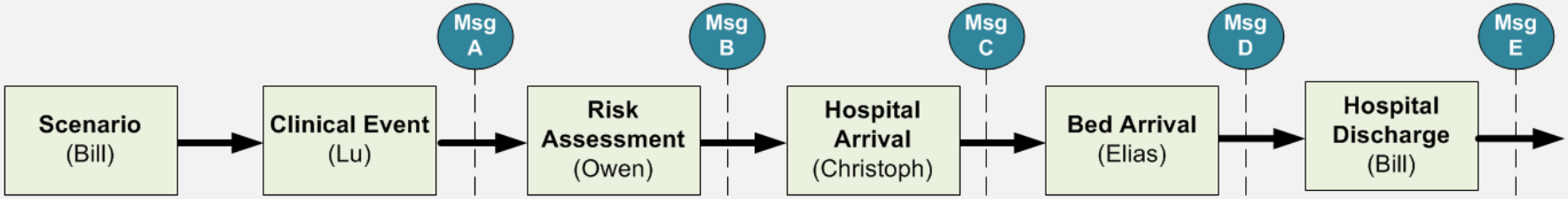
# Hospital Arrival

## Christoph Thuemmler



Deirdre

# Messages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Hospital Discharge
(Bill)
Msg E

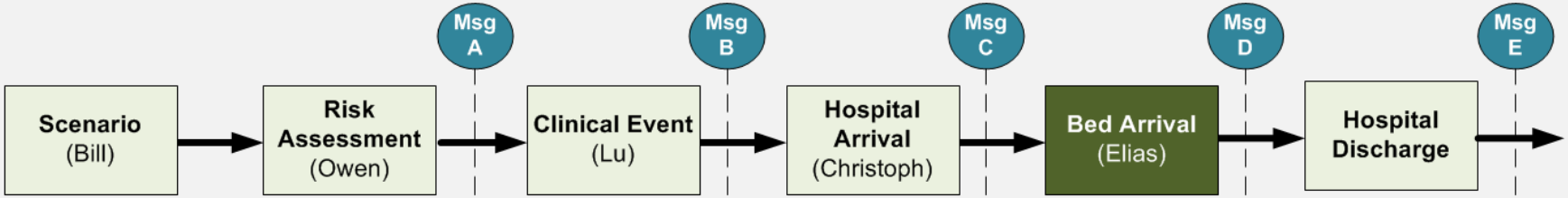
-95 3G 27.2 - 20:46 - 245MB 83%

Messages Clinical Edit

Patient Deidre has arrived.
EWS: 6
Clinical Alert: Stroke
HR: 58 BPM
BP: 225 mmHG
Temp: 37.0 degrees celcius
RR: 12 BF
SpO2: 98%
Next of Kin: John Doe

# Bed Arrival

## Elias Ekonomou



# The Problem

Relatives need to know where to find the patient in the hospital (ward, room, bed). Currently;

- They have to check with the information desk
- May be required to anxiously wait in a queue
- Names can be miss-spelled or confused
- Trained nurse staff spent time providing a basic service

# The solution

Staff that allocates patients to beds enter the bed's location information on a computer once

- May be entered to the cloud4health platform interface
- Or to the existing hospital system which will synchronise with cloud4health automatically

This information is then disseminated

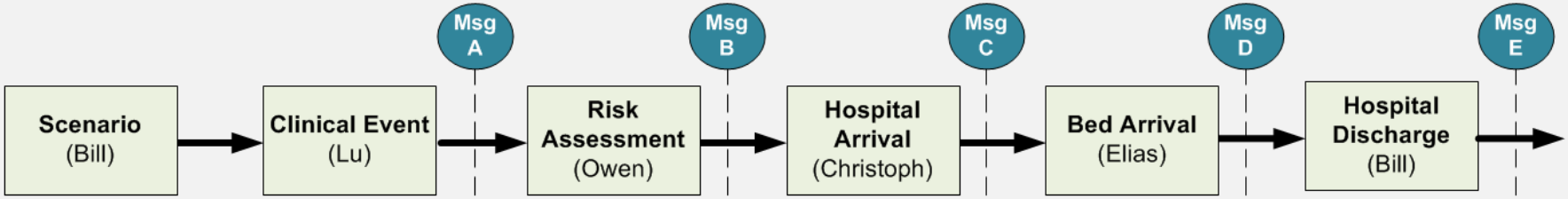
- Relatives receive a message with the bed information
- Other entities (GPs, Private doctors etc) may also receive a message

# Advantages

- Relatives can go directly to the bed, forward the message to other relatives or friends etc
- Hassle, miscommunication and anxiety is minimised
- Information desk costs are reduced

Deirdre

# Messages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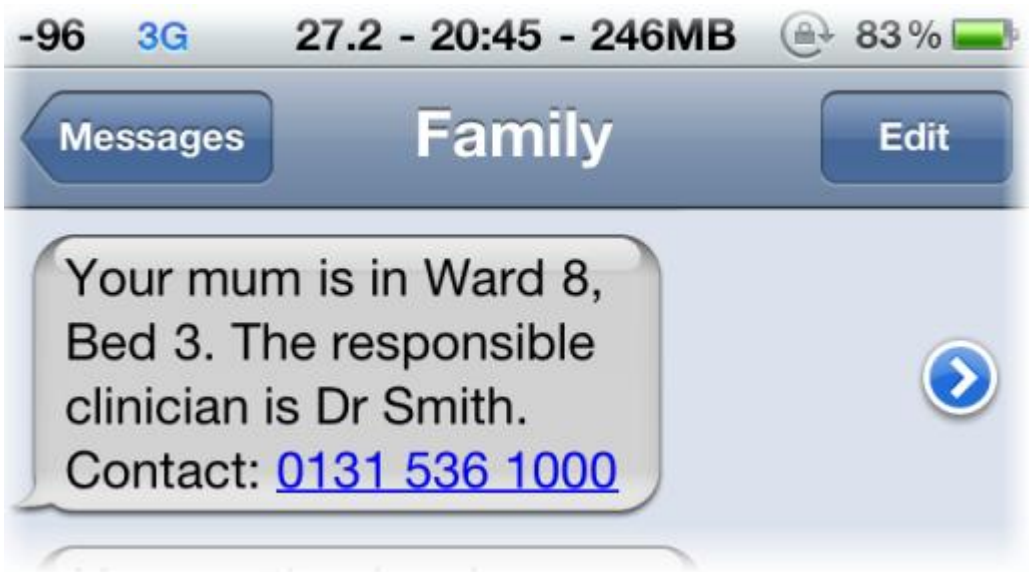
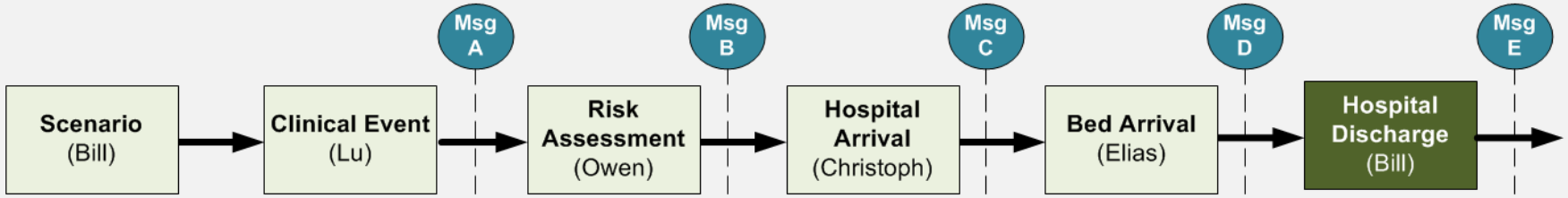

-96 3G 27.2 - 20:45 - 246MB 83%
Messages
Family
Edit
Your mum is in Ward 8, Bed 3. The responsible clinician is Dr Smith. Contact: 0131 536 1000

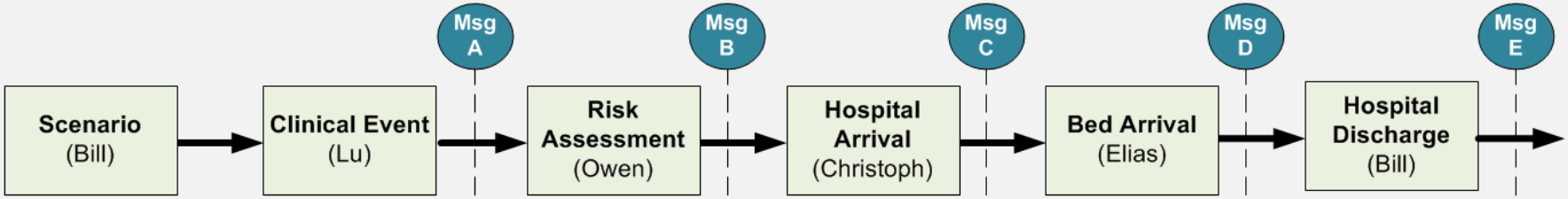
# Hospital Discharge

## Bill Buchanan



Deirdre

# Messages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Hospital Discharge
(Bill)
Msg E

-96 3G 27.2 - 20:45 - 246MB

Messages

Family

Your mother has been discharged from hospital. Her condition is stable. We hope she receives a full recovery in due time. Her GP has been informed.

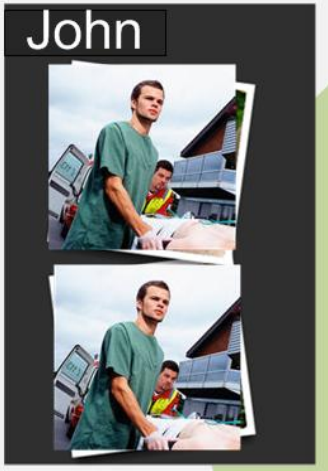
-95 3G 27.2 - 20:46 - 246M

Messages

G

Patient Deidre has been discharged from hospital. She suffered a stroke but has recovered successfully. Her medical records will be forwarded to you briefly.

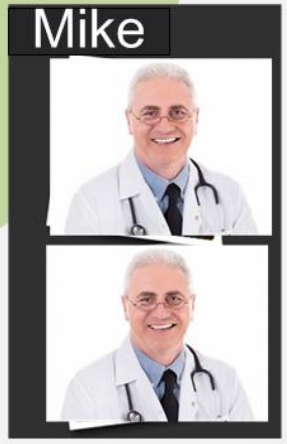
[Ambulance Staff]: Elias



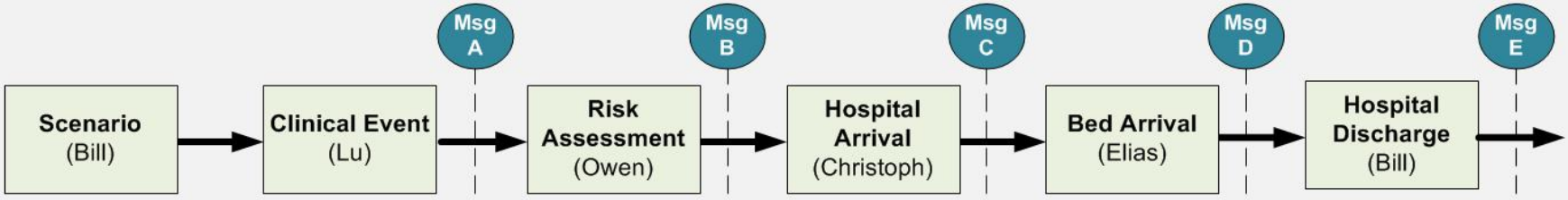
[Deidre]: Owen

[Clinical Staff]: Christoph

[Family]: Lu




[GP]: Bill



# Questions and Discussion

Sponsor:

intouch with health

HOLYROOD

Thank you for attending

# WORKSHOP THREE:

## HOLISTIC HEALTHCARE WITHIN DYNAMIC INFORMATION INFRASTRUCTURES - THE CLOUD BASED eHEALTH PLATFORM

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HOLYROOD