



FUNCTIONAL REQUIREMENTS AND TECHNOLOGY BLUEPRINT

Community Based Surveillance

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Tele i e SMS ga e a in eg a ion ool and eb managemen in e face	

Introduction

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CBS project introduction

High level elements

High level functional elements

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Use case description

- **Data collector**

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- **Data verifier**

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- ☐

- ☐

- ☐

- ☐

- **Data owner**

- ☐

- ☐

- ☐

- ☐

- **Data consumer**

- ☐

- ☐

- ☐

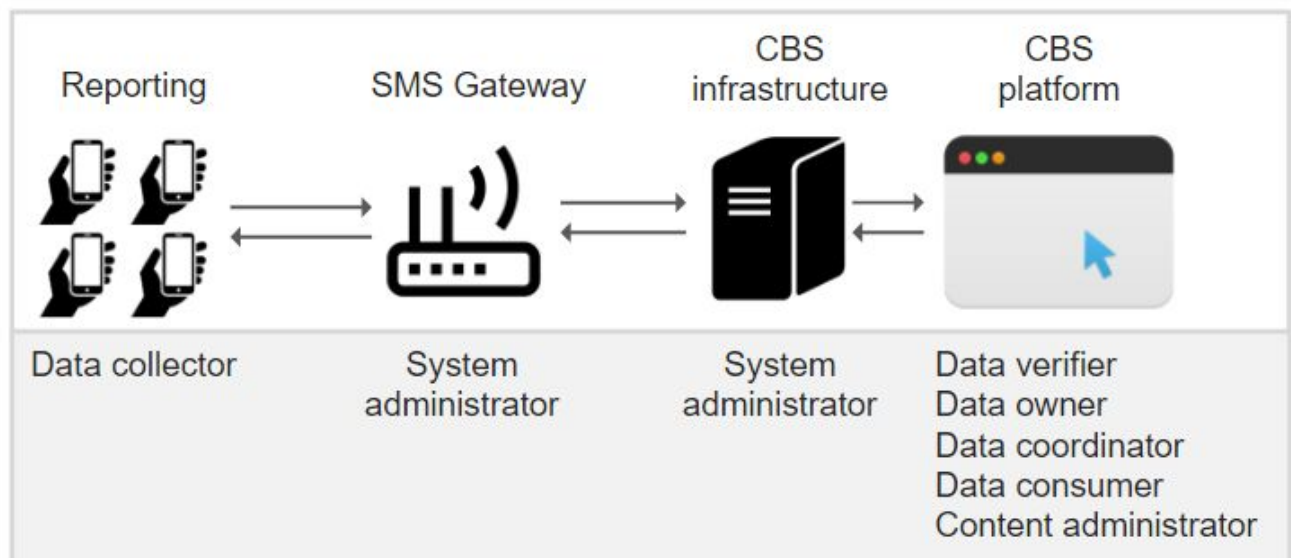
- **Data coordinator**

- ☐

- ☐

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- **Content administrator**
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- **System administrator**
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High level data flow and roles



Workflow support for alerts

Feedback loops

Data model and integrity

Reporting

User friendliness

Functional elements

Provide a CBS account

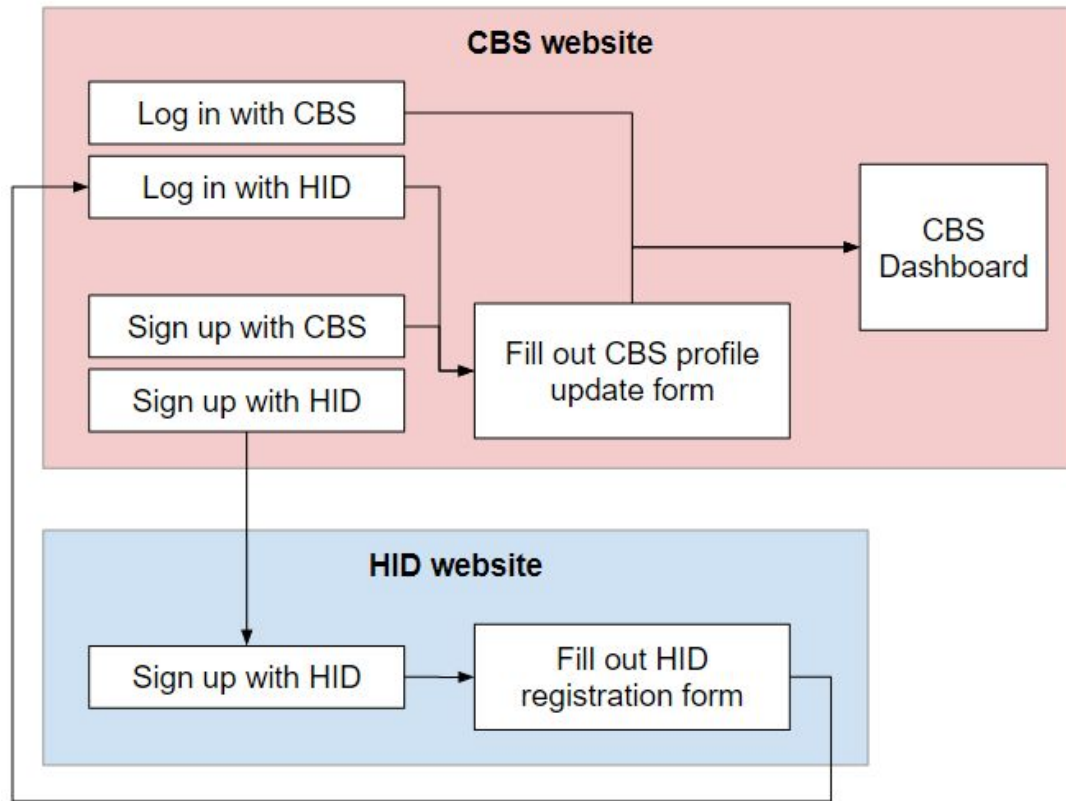


Diagram showing the process of registering as a new CBS user

M	Mandatory
O	Optional
A	Automatic
AM	Automatic, with manual override

	System administrator	Content administrator	Data coordinator	Data owner	Data verifier	Data consumer	Data collector	Input type
Full name	M	M	M	M	M	M	M	Free text
Display name	M	M	M	M	M	M	M	Free text
Email address	M	M	M	M	M	M		Text with email format validation
Year of birth		M	M	M	M		M	Year (YYYY)
Sex (Male, female, other)		O	O	O	O		M	Radio button
National society/IFRC/ICRC		M	M	M	M			Drop down
Which CBS National societies are you following?		M	M	O	O	M		Drop down, multiple choice
Preferred language		M	M	M	M			Drop down - only languages confirmed by system configurator available
Mobile phone number(s)		M	M	M	M		M	Text with phone number format validation
Duty station (Head office, branch)				M	M			Radio button
- if branch: Please specify				O	O			Drop down
Location (GPS or area)					M	M	M	Radio button
- if GPS: Coordinates (Long-/latitude)					O	O	M	Number with coordinate validation
- if area: Please specify					O	O		Free text or drop down
Role (RC volunteer, RC staff, other)				M	M	M		Radio button
- if RC staff: Please specify job title					O	O		Free text
- if other: Please specify					O	O		Free text
Organisation/Affiliation (Nat. Soc. or other)					M	M		Radio button
- if other: Please specify					O	O		Free text
Mobile phone number confirmed		A	A	A	A		A	System generated
Registration date	A	A	A	A	A	A	A	System generated
Data verifier 1							AM	Automatically set to the user who registers the new user. Can be manually overwritten.
Data verifier 2					O			
Data verifier 3					O			
Data owner					AM			Automatically set to the user who registers the new user. Can be manually overwritten.

Role-information requirement matrix

P Se ing p a ne na ional ocie da a epo i o

A Web Page
http://

CBS
Case Reports
Users
Admin
Project
Project Name
Username

Project Name
Export / Print
Save

National Society:
Norwegian Red Cross
Data owner:
Project Name:
Surveillance context:
☒ Single Reports
☐ Aggregate Reports
Date Range:
01/12/2017
24/12/2017

Health Risk	Health Risk	Threshold	3	Case Definition	
Health Risk	Health Risk	Threshold	3	Case Definition	
Health Risk	Health Risk	Threshold	3	Case Definition	
Health Risk	Health Risk	Threshold	3	Case Definition	
Health Risk	Health Risk	Threshold	3	Case Definition	

Conceptual sketch for adding new national society data repository

P Da a collec o egi a ion

Add user

The image shows a conceptual mockup of a web browser window. The browser's address bar displays 'http://'. The page has a navigation bar with links: 'CBS', 'Case Reports', 'Users', and 'Admin'. The main content area is titled 'Users' and features a search bar and an 'Add User' button. A modal form titled 'Add user' is open, containing the following fields and options:

- Type: Data Verifier (dropdown)
- First Name: (text input)
- Last Name: (text input)
- Age: (text input)
- Sex: Male (dropdown)
- Preferred language: Norwegian (dropdown)
- GPS location: lat (text input), long (text input), [Get from device](#), [Pin on map](#)
- Mobile phone number(s): (text input) with a note 'A comma separated list is supported'
- Email address: (text input) with a note 'optional' and an 'Add' button

Conceptual mockup of form for user registration

P Da a collec o a pda e

User story #	Activity	Role	User Story	Functional requirements (system shall...)
P	Upda e da a collec o a	Da a Collec o	A a da a collec o l an o e m a opa i e o ha l do no ecei e an mo e e e f om RC	e pond o a p e defined igge o d e a opa i e en b SMS and e he da a collec o a opa i e no end info ma ion o da a collec o i h pa i e a

P	Feedback	Da a Collec o	A a da a collec o l an o e cei e feedback ha m a ha been pda ed o ha l can kno if m pda e a cce f l	end confi ma ion b SMS if he da a collec o en he p e defined igge o dfo e a o pa i e and he em e he da a collec o a o pa i e end feedback if he igge o d i no in he em ocab la
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Use stories and functional requirements of data collector status updates (P04)

P Da a collec o info ma ion pda e

User story #	Activity	Role	User Story	Functional requirements (system shall...)
P	Send con ac e e	Da a Collec o	A a da a collec o I an o ha e omeone call me and pda e m info ma ion o ha i i co ec	e pond o a p e defined igge o d fo callback en b SMS b a da a collec o
P	Feedback	Da a Collec o	A a da a collec o I an o ecei ed feedback ha m SMS a ecei ed and i h info ma ion on ho ill con ac me	end info ma ion on ho ill make con ac b SMS if he da a collec o en he p e defined igge o d fo callback end feedback if he igge o d i no in he em ocab la
P	Con ac da a collec o	Da a e ifie	A a da a e ifie I an o pda e he info ma ion egi e ed on a da a collec o o ha i i co ec	end an SMS o he da a e ifie i ha e e o callback he da a collec o and he con ac de ail of he da a collec o end a link of he da a collec o p e io I eco ded de ail ha open in he e ool pda e he info ma ion on he da a collec o hen ne info ma ion i a ed in he e ool

Use stories and functional requirements of data collector information update (P05)

P Reg la feedback

User story #	Activity	Role	User Story	Functional requirements (system shall...)
P	B lk me age da a collec o	Da a e ifie o nR		

A Web Page
http://

CBS
Case Reports
Users
Admin

Feedback messages
Health Risks
SMS Gateways
Send message

Add Message

Event	Language	Message	Actions
			Edit Delete

Add message

Event
Singe Case Report Successfully Recived

Language
Norwegian

Insert:
Reporter Name
Key Message

Add

Conceptual mockup of interface for adding feedback messages

Edit Feedback message 1 admin

A Web Page
http://

CBS
Case Reports
Users
Admin
Project
Project Name
Username

Feedback messages
Health Risks
SMS Gateways
Send message

Add Message

Event	Language	Message	Actions
			Edit Delete

Edit message

Event
Singe Case Report Successfully Recived

Language
Norwegian

Insert:
Reporter Name
Key Message

Add

Conceptual mockup of interface for editing feedback messages

Edit Feedback message 2 admin

A Web Page
http://

CBS
[Case Reports](#)
[Users](#)
[Admin](#)
Project
Project Name
Username

Feedback messages
[Health Risks](#)
[SMS Gateways](#)
[Send message](#)

Add Message

Event	Language	Message	Actions
			Edit Delete

Edit message

Health risk
Plague

Language
Norwegian

Message
Insert:
Reporter Name
Key Message

Add

Conceptual mockup of interface for editing SMS feedback messages

Send Message Admin

A Web Page
http://

CBS
[Case Reports](#)
[Users](#)
[Admin](#)
Project
Project Name
Username

Send Message
[Health Risks](#)
[SMS Gateways](#)
[Feedback messages](#)

Send to
☒ Project
☐ Project Role
☐ Single User

Message

Confirm
☐ Yes, I want to send this message to 30 people
☐ Yes, delay this message to be sent tomorrow

Send Message

Conceptual mockup of interface for sending SMS messages

P Case reporting by data collection

Non-human health risks

Structure: [Event]

13

Single report

Structure: [Event]#[Sex of case]#[Age group]

3#1#2

#

Aggregated report

Structure: [Event]#[Number of male cases 0-4 years old]#[Number of male cases 5 years and up]#[Number of female cases 0-4 years old]#[Number of female cases 5 years and up]

males	0-4
males	5
females	0-4
females	5

3#1#0#4#2

#

User story #	Activity	Role	User Story	Functional requirements (system shall...)
P	Report case	Data Collector	As a data collector I can report a case if needed	accept SMS message from data collector
P	Receive confirmation	Data Collector	As a data collector I can receive confirmation if message is received	validate case report on data collector end a confirmation by SMS if the validation is successful
P	Receive feedback if report is successful	Data Collector	As a data collector I can receive feedback if message is bad formatted or has an error in the collection	validate report end feedback by SMS on the data field did not validate if validation is successful
P	Receive information	Data Collector	As a data collector I can receive information on an report made in relation to the report I just sent or have I can propose a communication	end an SMS in a pre defined message for the case reported

Use stories and functional requirements of data collector case reporting (P07)

P Ale

User story #	Activity	Role	User Story	Functional requirements (system shall...)

Use stories and functional requirements of alert workflow

Alert ID

Case # 1 ☐ FALSE ☒ POSITIVE ☐ UNCONFIRMED *

Case # 2 ☐ FALSE ☒ POSITIVE ☐ UNCONFIRMED *

...

Case # n ☐ FALSE ☒ POSITIVE ☐ UNCONFIRMED *

Disease Confirmed? ☒ YES ☐ NO *

Type of disease *

Open text report: *

Inform volunteer? ☒ YES ☐ NO *

Optional custom volunteer message

Escalate to RHC? ☐ YES ☐ NO *

Read only alert ID

Cases associated to alert ID

Required response

Skip logic

default yes

Skip logic

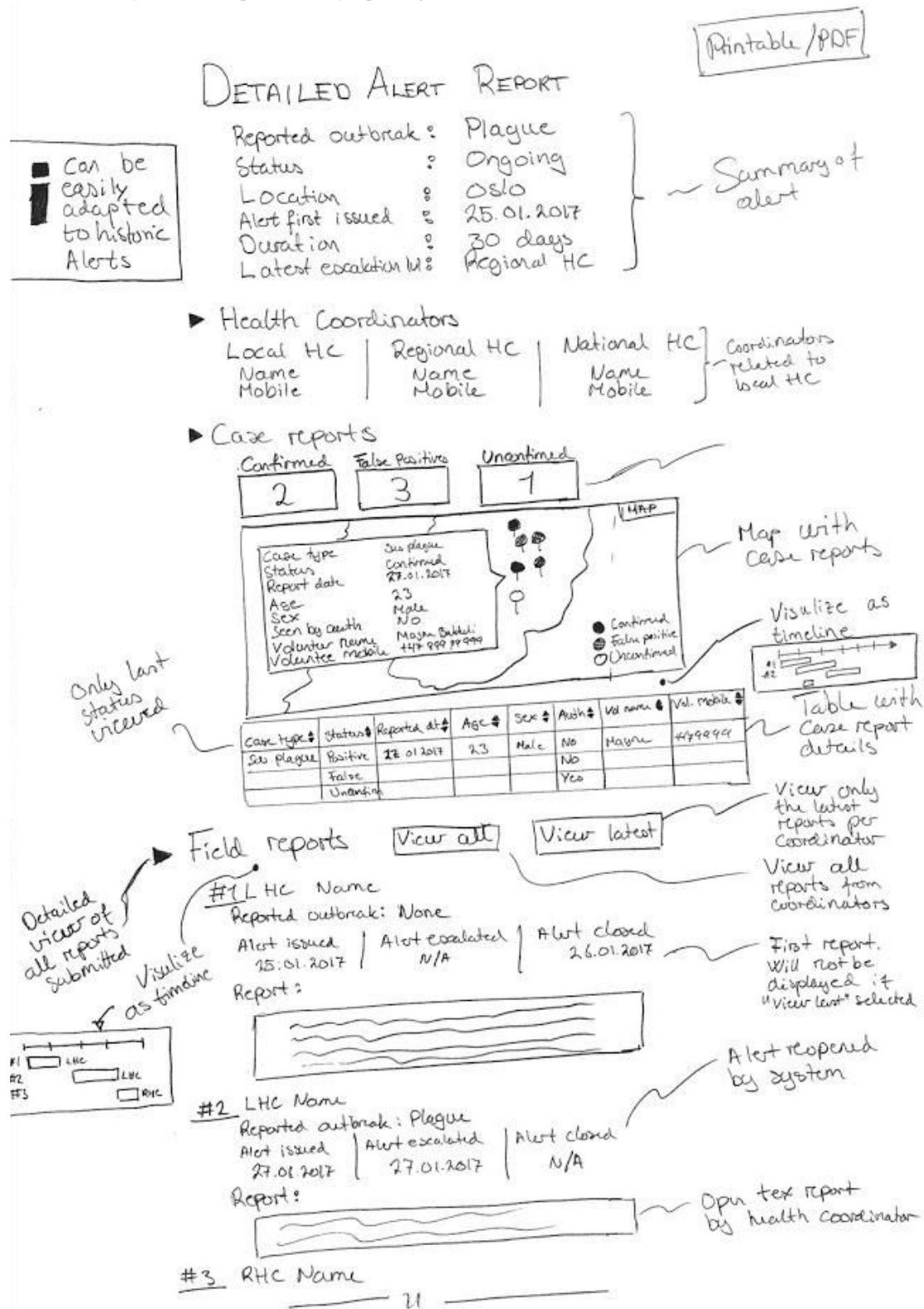
default yes if disease confirmed

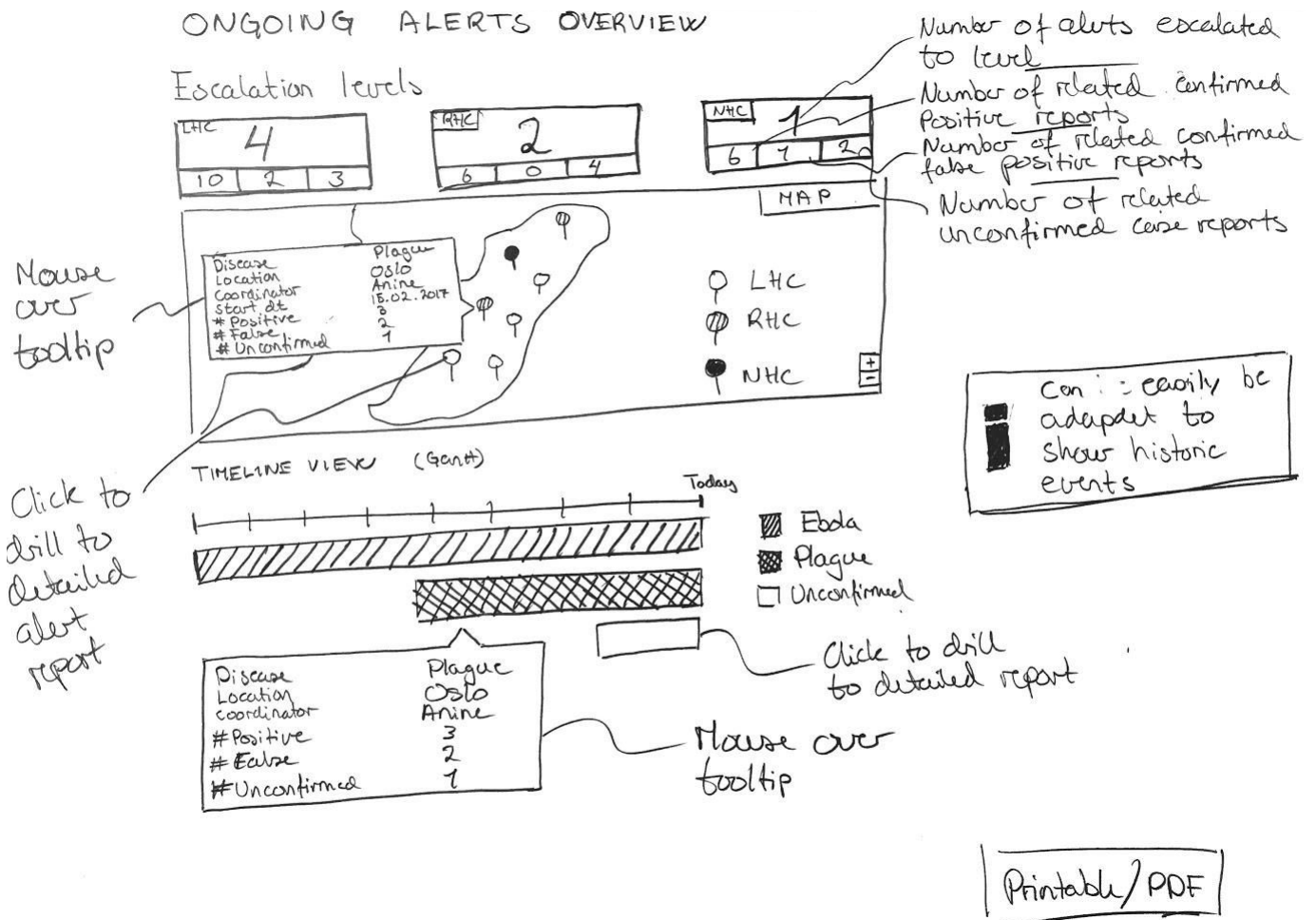
Alert form LHC

Conceptual mockup of alert form

PS! Some mockups use outdated wording. LHC is now called Data Verifier, RHC is Data Verifier (higher level verifier). Volunteer is Data Collector.

[illegible]





Conceptual mockup of report overviewing ongoing/historic alerts

P Config e ale defini ion

User story #	Activity	Role	User Story	Functional requirements (system shall...)
P	Alert definition	Da a o ne	A a Da a o ne I an o change he pa ame e ha define he h e hold of hen an ale ho ld be i ed o ha he ale en i i i i imp o ed	p o ide an in e face o change he pa ame e ha define an ale

Use stories and functional requirements of configuration of alert definitions

P User access and Identity Management

User story #	Activity	Role	User Story	Functional requirements (system shall...)
P	User access management	System administrator	As a system administrator I want to be able to define roles and permissions for different parts of the system so that I can manage user access	provide a management interface to define roles and permissions for different parts of the system

Use stories and functional requirements of user access and identity management

P System monitoring

User story #	Activity	Role	User Story	Functional requirements (system shall...)
P	System monitoring	System administrator	As a system administrator I want to know if one of the components has failed so that I can fix them	log system components and how many components are active

Use stories and functional requirements of system monitoring

Non functional e i emen

Security

-

-

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Performance

-

-

Integrity

-

-

-

-

Usability

-

-

Recovery

-

Documentation

-

-

Deployment

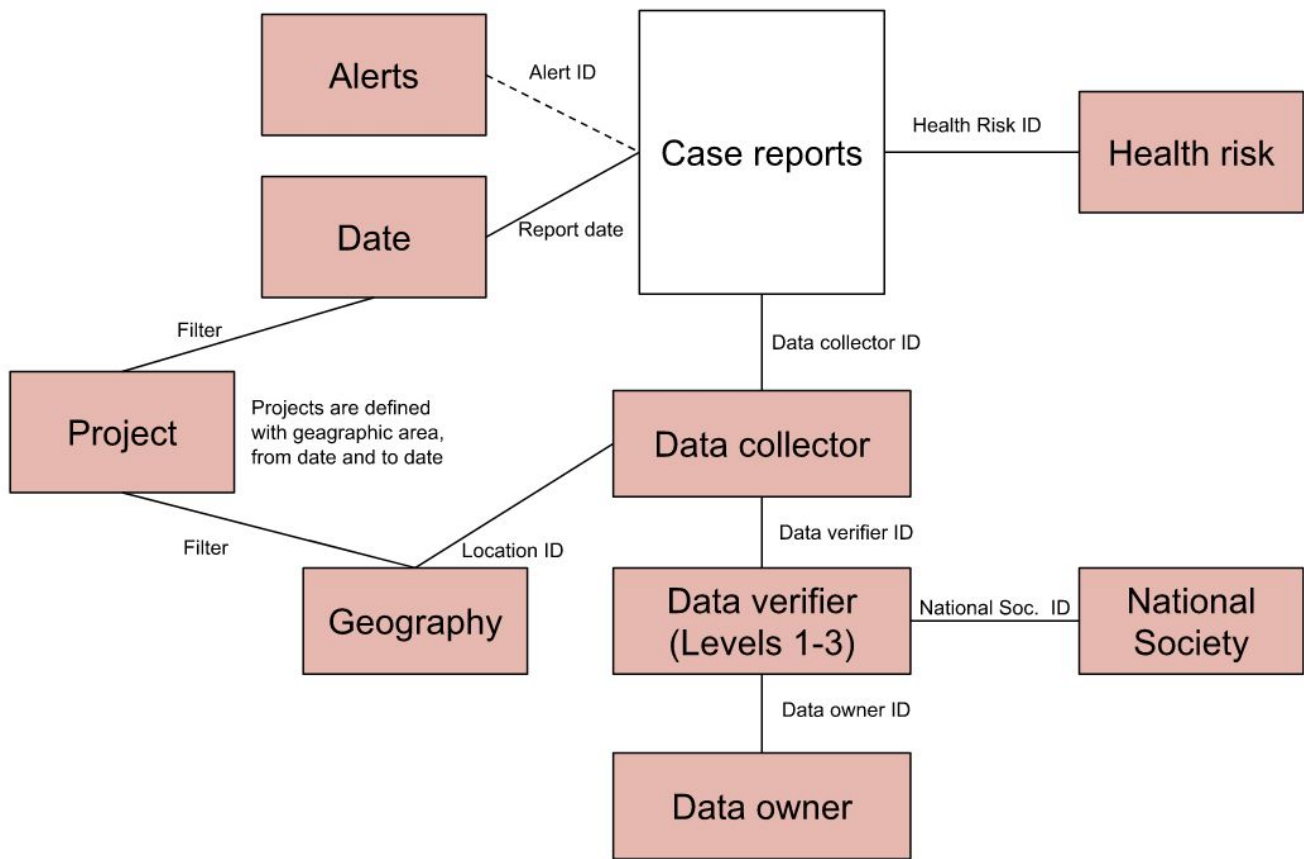
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High level em e i emen

Componen

Da a model



High-level data model for reporting

- **Health Risk**
- **Data Collector/Verifier/Owner**
- **National Society**

- **Geography**

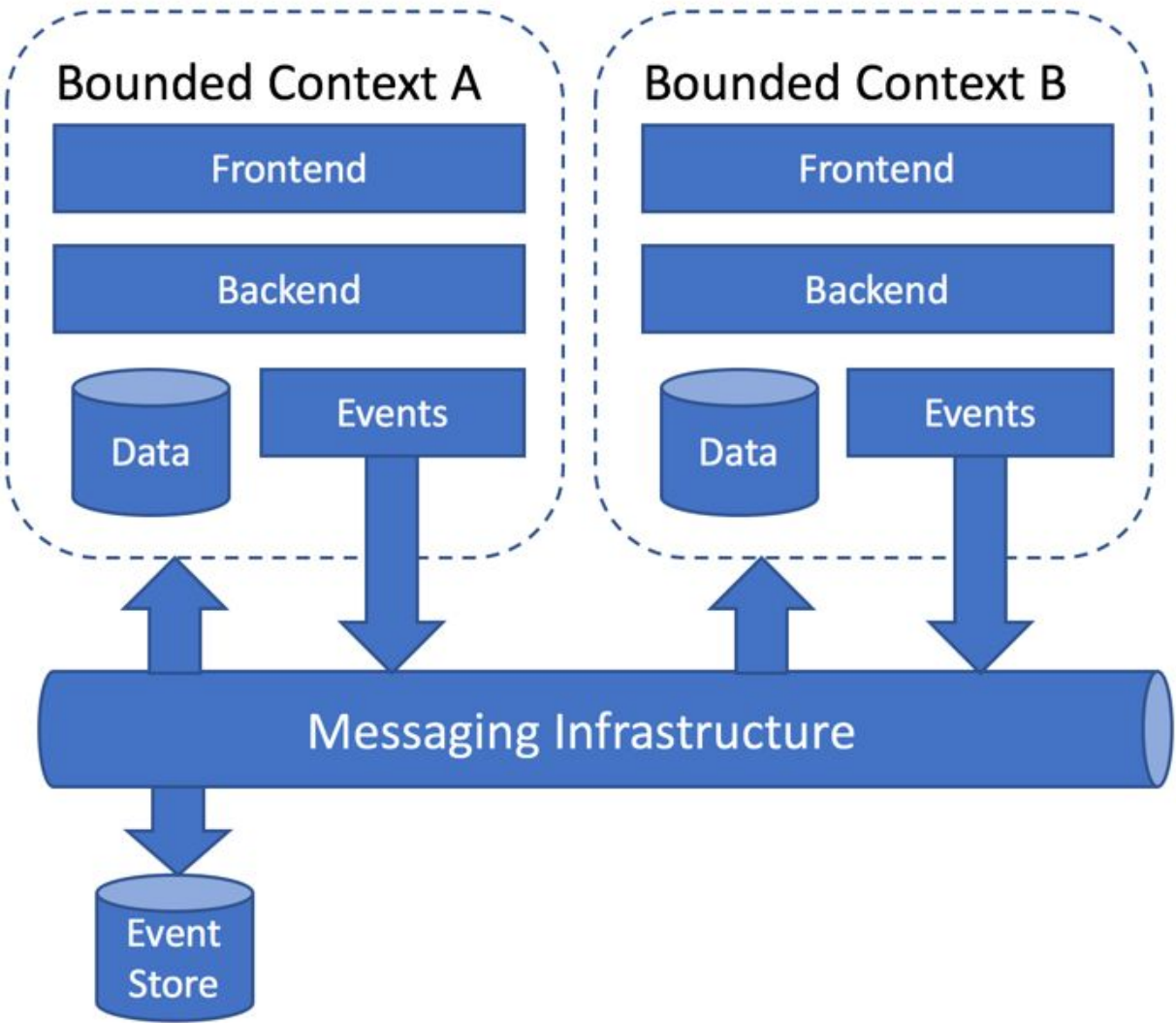
- **Date**

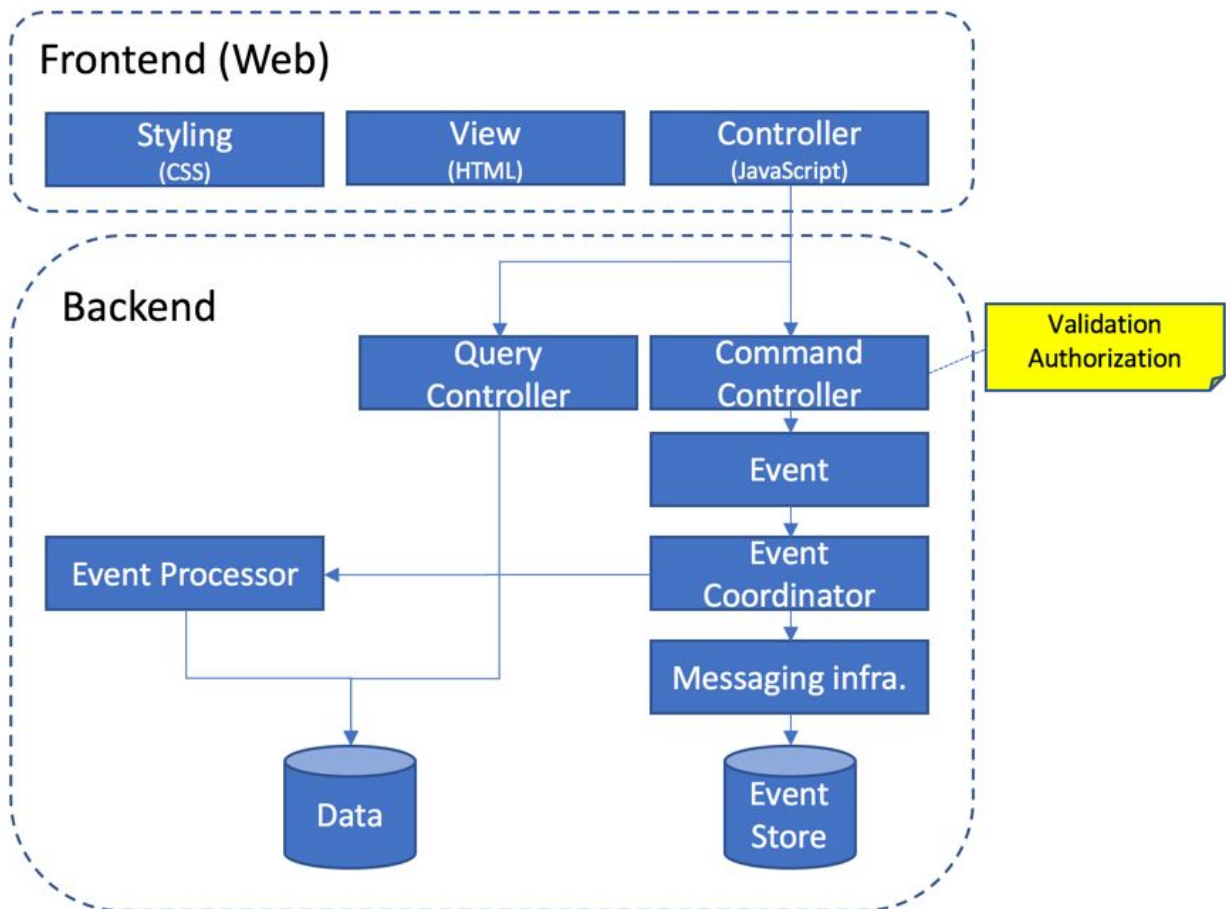
- **Project**

- **Alerts**

Technical information

Bounded context conceptual description





Bounded context CBS implementation

Bounded contexts included in MVP scope

Volunteer Reporting

Admin

User management

Portal and infrastructure

" "

Bounded contexts not included in MVP

Alerts

Reporting

" "

CBS da a flo

CBS em a chi ec e

Appendix A List of health risks

Health risk number	Health risk name	Type of health risk
		Human
		Human
		Human
		Human
		Human
		Human
		Human
		Human
		Human
		Human
		Human
		Human
		Human
		Human
		Animal
		Human
		Pregnant women
		Human
		Human
		Human
		Human
		Human
		Human, animal, environment
		Animal
		Human
		Human
		Human

		Human
		Animal
		Human
		Human
		Human

#

Appendi B SMS Eagle pec

SMS Eagle of a e fea e

- • • • •

Sending/Receiving Throughput

- Eagle used by CBS has two modems → 60 incoming per minute
- Eagle used by CBS has two modems → 40 outgoing per minute
-

SMS

SMS

Software platform

-
-
-
-
-
-

SNMP agent capabilities

-
-
-
-
-
-
-

Technical pec

Hardware

-
-
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External antenna

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General

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Appendi C T igge le fo ale

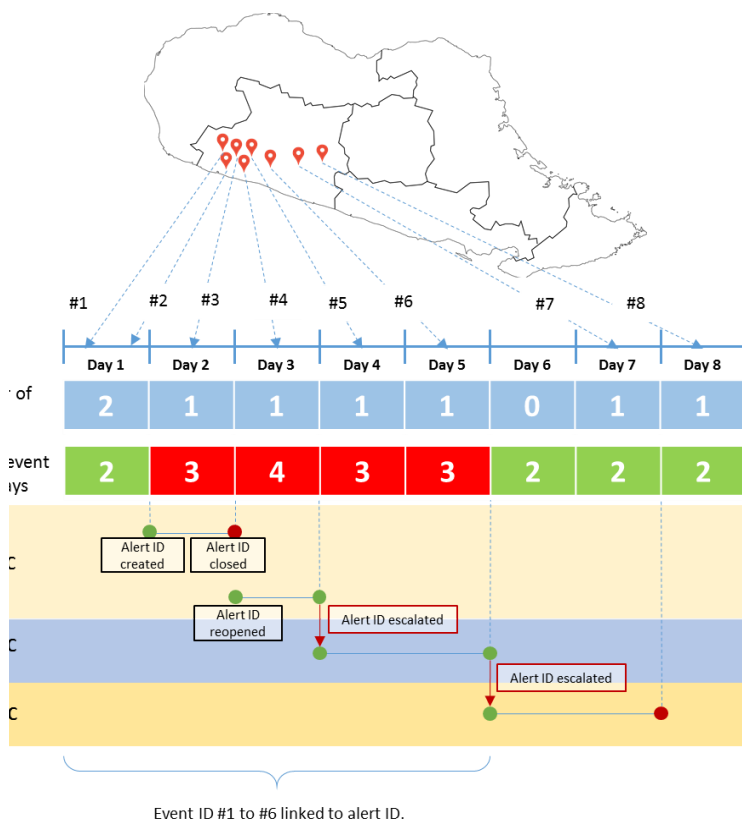


Figure 10 Illustration of hypothetical alert workflow and case report linking to alert IDs

Hypothetical scenario

If he m of e en he la h ee da
e ceed i e an ale

Day 1

T o e en a e epo ed b an ale i no i ed

Day 2

The ale igge a me age o he le el da a e ifie
and an ale ID i c ea ed The da a e ifie in e iga e
b concl de he ame da ha he ale ho ld no be
e cala ed and bmi he fo m clo ing he ale ID
E en a e linked o he ale ID

Day 3

The ale ID f om da i eoopened ince a ne e en
ha been egi e ed and he n mbe of e en ill i
abo e h ee The le el da a e ifie decide o bmi
he ne finding and e cala e he ale ID o he le el
da a e ifie E en i linked o he ale ID

Day 4 and 5

Ne e en a e epo ed b ince he ale f om da
i ill ac i e a ne ale i no i ed The le el da a
e ifie pend da o in e iga e he ale On da
he decide o bmi hi finding and e cala e he ale
o he da a o ne E en and a e linked o he
ale ID

Day 6 and 7

The da a o ne ake if ac ion and decide on da
ha he ale i a fal e po i e The da a o ne bmi
he finding and he ale i clo ed Since he n mbe of
ale a e i hin no mal e en i **not** linked o he
ale ID

Day 8

The e en doe no igge a ne ale ince he m of
e en a e nde he e h e hold al e

Appendix D Note on specific technologies applied

Fulcrum App See tool



Multiple Platforms	Data Events	Real-Time Tracking	Rich Media Collection
Monitor Productivity	Team Roles	Export Options	Import Tools
Offline Data Collection	Custom Form Builder	API Integration	Secure Storage

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fulcrum

Hydrants

Go Back

Jason's Team

Add Fields

Text

Numeric

Yes / No

Label

Single Choice

Multiple Choice

Classification Field

Photos

Videos

Barcode

Field Settings

OBJECTID

Manufacturer

Year Manufactured

Valve Size

Elevation

App Settings

App Name

Hydrants

Description

App Status

Active

Record Title

Title (OBJECTID)

Enable Status Field

Status Field (Disabled)

Auto Assign Records

Save and Exit

Save and Continue

Tele i e SMS ga e a in eg a ion ool and eb managemen in e face





