



Fjelltopp

Harmonising Health Data

Interoperable Public Health Data Hub

A fully costed proposal for phase one

Introduction

We propose terms of reference and a budget to establish a health data hub in your country or institution. Fjelltopp can lay the groundwork for this project at a cost of \$29 400 USD, over a period of two to three months. Among other benefits, the project will help you:

- Harmonise data across multiple fragmented systems and partners;
- Grant access to data through a password-protected, user-friendly, website;
- Ensure important data is stored in a secure and fail safe environment;
- Automate repetitive data management processes;
- Browse and search quickly across all public health data in the hub;
- Provide external partners with secure and licensed access to sensitive data;
- Publish data on the web in a professional manner with visualisations and metadata.

Under the terms of this proposal we would build a data hub by re-using code from our other public health data management projects and the “open source” community. This system would be fully functional, but quite generic, and we would expect the client to have further feature requests and system requirements after reviewing our work. We will work with stakeholders to capture these needs in a software requirements specification document that can be used to direct any further development work if so desired.

The Fjelltopp team has been working since 2015 with the UN and Ministries of Health across the globe to help collect, manage and harmonise public health data. We registered as a company in 2018, and since then have worked with four different UN agencies (including WHO and UNAIDS), in more than 10 different countries, on a variety of public health technology projects. Our largest project is a multi-national data hub for UNAIDS Geneva, called the [AIDS Data Repository](#). As a social enterprise registered in the UK, we are committed to reinvesting a majority of our profits into our social mission.



Technical Overview

A data hub is an online platform (website) for collecting, cleaning, organising, archiving, and securely distributing data as necessary. It should provide a “one stop shop” for internal and external partners who need regular access to some part of an institution's catalog of data.

The problem:

- Public health data often sits across many fragmented systems, with no single system providing a unified view of the data.
- Public health datasets are often missing important metadata and data dictionaries.
- Large health information systems such as DHIS2 are not suited to sharing data securely with non-technical external partners.
- Cleaned and processed datasets may be stored on personal computers vulnerable to hardware failure and staff turnover.
- Sensitive data may be distributed by unencrypted email in an untraceable manner.
- Large amounts of repetitive work may be found in extracting and processing data for synchronization across multiple systems, or for sharing with external partners.

[CKAN](#) is a large open source project that is used by governments, NGO's and corporations around the world to help manage their data and share it securely with those who need it. For some examples of other CKAN instances visit [data.gov.uk](#), [data.gov](#), [data.humdata.org](#), and [ckan.org/about/instances](#). Out of the box, CKAN provides a user-friendly and feature-rich website to help you manage your data, along with a comprehensive API for interoperability with other software systems. Under the terms of this proposal we will configure and deploy a CKAN instance as the basis of your data hub and layout a possible development plan to tailor it according to your needs. Examples of such needs include: robust automated data pulls from pre-existing systems, further flexibility in data access management, improved data visualisation, data validation, data analysis, sms notifications, and data versioning.

In many cases a pre-existing open-source CKAN extension may already exist to deliver a specific feature you desire, meaning we can configure and tweak the existing work comparatively cheaply. We also may choose to use other large open-source data engineering projects to build features as required into your data hub, for instance:

- [Superset](#) - To build interactive and configurable business intelligence dashboards on top of your data in the datahub (we can work with Microsoft Power BI or Tableau as an alternative if preferred)
- [Frictionless Data](#) - To manage metadata, data dictionaries and data validation upon upload into your data hub.
- [AirFlow](#) - To automate data management tasks, including extraction, processing and loading of your data in and out of your data hub and/or third party systems.



Terms of Reference

1. **[Setup of the base system]** A project such as this requires time invested in configuring and setting up the server and network infrastructure required to run the system. We take the quality of our software and service very seriously, seeking to exclusively use modern standards for the continuous delivery of stable software. The CKAN open source software project will form the core of the system's functionality.
 - a. Containerised and automated deployments of the CKAN software, so that new features can be deployed without downtime.
 - b. Containerised development environment for ongoing development and maintenance of the system.
 - c. State of the art security measures put in place to protect the servers running the system.
 - d. Automated restart of the system in the event of a crash.
 - e. Website colour schemes, logos, fonts, and other styles tailored to the client's specifications.

2. **[Assessment of data sources, interoperability and system requirements]**

Through meeting system stakeholders, we will seek to map out the problem space and identify opportunities for the project. This includes identifying the data that could be loaded into the data hub, the political and technical challenges to achieving this, and some initial technical assessment of the route forwards for system interoperability.

 - a. Meeting system stakeholders
 - b. Mapping out data sources and data users
 - c. Some technical assessment of interoperability challenges with specific third party systems

3. **[System Initialisation]** The value of the data hub will only be clear if there is some data in the system. We can write scripts that will bulk upload large amounts of data into the system at once. If there is no data immediately available for this purpose, we can generate test data for the purposes of demonstration.
 - a. Initial organisations/users setup and UI configuration
 - b. Bulk upload of some pre-existing data to your data hub for demo purposes
 - c. Optional demo of integration with DHIS2 or other health surveillance system

4. **[Software Requirements Specification (SRS)]** It is likely that further work will be desired to build tailored features and interoperability with other systems. An SRS is a document that describes exactly what features should be developed. It will summarise all our findings under the terms of this proposal and help map the



technical route forwards. Should a tender be published to acquire further development work, the SRS would be an essential part of the tender, and explain on a technical level what work should be done.

- a. Summary of system stakeholders and needs
 - b. Detailed and prioritised list of features to be developed
 - c. Technical development strategy
5. **[6 months of secure cloud deployment]** This is optional, depending on how the system should be hosted. Our preferred option is cloud-based infrastructure in Amazon Web Services (AWS) which has been proven to be cheaper, more secure, more reliable, more readily available and scalable than local infrastructure (e.g. servers on-site in your institution). Since the documents have been cleaned and approved for sharing publicly on the web, we hope that it will be possible to pursue cloud based hosting for this system, as it may prove crucial to the project's success - particularly as the system grows. If this is not possible we can re-think this part of the budget for hosting the system in on-site servers.
- a. Hosting the system under a web address of your choice.
 - b. The site will be set up in it's own cloud account that can be easily handed over to any ongoing maintenance team whenever necessary.
 - c. We include in this budget 6 months of estimated hosting costs for the system in AWS. At the end of the 6 months either the client should take over ownership of the AWS account and pay the costs directly themselves, or a new maintenance contract should be agreed with a third party company (such as Fjelltopp) who will continue to manage the account on your behalf.
 - d. The budget also includes 6 days (1 day per month) of maintenance work to ensure the system remains stable throughout the period, and can be smoothly transitioned at the end of the period as necessary.



Budget

We are happy to discuss amending the budget and TOR as necessary to fit your needs. The proposed budget for undertaking the work outlined above would likely be as follows:

Item	Number	Unit	Rate	Total
Setup of the data hub using CKAN	18	days	\$600	\$10,800
Assessment of data sources, interoperability & system requirements	10	days	\$600	\$6,000
System initialisation	5	days	\$600	\$3,000
Software Requirements Specification	5	days	\$600	\$3,000
Project Management and Admin @ 5%	2	days	\$600	\$1,200
6 months of secure cloud deployment	6	months	\$900	\$5,400
			Total Cost	\$29,400
			Total Days	40

(Development typically undertaken over a period of 2-3 months)

We recommend that further budget be found for one or two weeks of travel to your office, during which we can conduct requirements analysis and meet system stakeholders. Our team is familiar with planning and undertaking international travel according to UN policy.

Company Background

Since 2015 our international consultancy team of engineers and data scientists have worked closely with field experts and local partners to develop technology that facilitates integration, management and comprehension of public health data and systems across the globe, especially in low and middle income countries. We are a social enterprise registered in the UK and have committed to reinvesting a majority of our profits into our social mission.

As an advocate of the [principles of digital development](#), we seek to provide technical solutions that are sustainable, open-source, interoperable, and user-orientated. Our team achieves this by fostering a culture of integrity, remaining in close transparent communication with our clients at all times, and placing a high value on training, development, and our ties with academia.

The Fjelltopp team was formed in 2015 as a group of individual WHO and UNICEF consultants to build an electronic, mobile, real-time, case-based, interoperable public health surveillance systems for the Ministries of Health in Jordan and Somalia. In February 2018 the team founded Fjelltopp to provide ongoing support to our existing clients and widen the portfolio of our work and experience. For more information about our company please visit: fjelltopp.org.



Experience and Testimonials

“Working with Fjelltopp has been a pleasure. The team is responsive to our technical needs, has quickly picked up the complexities of our substantive work, and has been forward-thinking by identifying solutions that our clients will appreciate.”

Dr Mary Mahy | Epidemiology Team Lead, UNAIDS Geneva

Data Portal for UNAIDS | The "AIDS Data Repository" project aims to improve the quality, accessibility and consistency of HIV data and HIV estimates by providing a centralised platform for countries to manage and share HIV data supported by UNAIDS. We are consulting with international funding bodies and universities as well as with in-country data management teams to build this solution.

Public Health Surveillance for WHO | Fjelltopp have built tailored public health surveillance solutions for the WHO and Ministries of Health in Jordan, Madagascar, Somalia and the Central African Republic. The systems are case-based, real-time, interoperable, electronic, mobile, rapidly-deployable, and open-source. They provide early warning SMS and email alerts of priority disease diagnoses, real-time dashboards summarising the data, assessments of data completeness and timeliness, and stock management tools. Automated export of data to DHIS2 has been implemented.

DHIS2 Interoperability for UNICEF Somalia | We have used the DHIS2 API to build automated interoperability between DHIS2 and other systems for UNICEF somalia. In the engineering world there is a concept called Extract Transform Load (ETL) Pipelines, which encapsulates the common pattern of taking data from one place, changing it a bit, and putting it in another place. Fjelltopp are experts at creating these automated pipelines that help move data between systems in a frictionless manner.

And much more! We have also worked with FAO Bangladesh on COVID data management, WHO Geneva on the global WHO website, WHO Ukraine on an evaluation of their Emergency Medical Services, WHO Kazakhstan on an evaluation of their management practises and internal communication. For more information visit our website: fjelltopp.org

“There is so much more to Fjelltopp than managing and analyzing data. Their technical expertise, their analytical skills as well as their problem solving attitude is what has allowed WHO Kazakhstan to improve its emergency response and to set new operational standards in managing large-scale health care interventions.”

Dr Caroline Clarnival | Country Representative, WHO Kazakhstan



[Request a free consultation](#)

to discuss any questions you may have.

Fjelltopp would be delighted to consider collaborating with you on funding proposals if the funding for a project of this size is not currently in place.

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