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Usability requirements

for the Biosurveillance Resource Directory (BRD)

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1 Introduction

This document describes the usability requirements for the Biosurveillance resource directory (BRD); that is, who will be using the tool and what tasks they will be using it for. It does not include information on technical implementation (e.g., whether specific information is contained in the database or pulled on demand from other sources). It also avoids specific design ideas (such as widget descriptions) unless they are necessary to illustrate a requirement.

1.1 BRD overview

The Biosurveillance Resource Directory (BRD) is a database of infectious disease surveillance resources; it is a searchable, “one-stop shop” for this class of information. For example, it contains information on local, national and international surveillance systems, tools/software, data sources, and collectives/partnerships, and it covers human, plant, animal, and marine resources. Each record in the catalog is categorized based on the *Biosurveillance Data Stream Framework* developed by the DSA-3 biosurveillance team.¹

The database is searchable by full-text as well as multiple facets such as location, data stream use, sponsor, and disease. It is designed to help users rapidly and reliably select appropriate resources for their real-world situations. In particular, it offers domain-specific search tools several orders of magnitude more efficient in user time and effort than general web search tools like Google.

2 Assumptions

We list here the key assumptions upon which the BRD design is based. There is no particular order.

1. People will use the web app with a standard web browser and relatively large screen, at least 1280×768 at ~100 dpi. Specifically, targeting mobile devices is a future project.
2. Users can read English reasonably well (at the 8th grade reading level or better). This is selected as a level that is readily available among the target users, even those who are not native English speakers.
3. Users are proficient in basic computer use; that is, while they may be unfamiliar with the BRD, they are familiar with their operating system, browser, and related tools.
4. Users have medical or public health training and understand relevant jargon.

¹ Margevicius et al., “Advancing a framework to enable characterization and evaluation of data streams useful for biosurveillance”. PLOS ONE 9(1): e83730, 2014.
doi:10.1371/journal.pone.0083730.

5. There will be no user manual for the app. Rather, the app will be self-explanatory, with context-specific help available where needed.

3 Use cases

This section is a comprehensive listing of BRD use cases. Within each category, no ordering is implied.

Definitions:

- *Primary use cases* are the core roles of the tool. They support key deliverables and the principal work people use the tool to accomplish.
- *Secondary use cases* are other things we want the tool to be relatively useful for. We will not spend much time designing them, but we will try not to actively hinder or break them.
- *Tertiary use cases* are additional things people do that are not so important. These tend to be things that are weakly related to the BRD purpose, but they are still important to enumerate. We will spend very little design time here.
- *Non-use cases* are explicitly unsupported. They are currently or permanently out of scope.

3.1 Primary use cases

3.1.1 Information validation

Given a specific situation, search the catalog for data or information that can help validate and add to data that a user has on an ongoing disease outbreak. This includes:

- Browse currently existing biosurveillance resources.
- Find data sources/reports that can be directly linked to and accessed.
- Discover what resources are available for a particular disease, location, or combination of disease and location.

3.1.2 Follow-up

Given a specific record, locate additional information regarding that resource, doing so as quickly as the record allows. This information might include:

- Contact information for resource owners.
- Pointers to the resource itself (website, executables and/or source code).
- Pointers to user documentation.
- Pointers to scientific publications and/or technical documentation.

In other words, this use case supports interaction between analysts/users and owners/developers.

3.2 Secondary use cases

3.2.1 Data curation

Management of stored content. This includes:

- Adding new resources.
- Verifying existing record information.
- Updating information about existing records.
- Removing records which turn out to not meet the inclusion criteria.
- Soliciting verification and updates from others.

3.2.2 Gap analysis

Understand the state of the art in data streams, and other resources for a given context (disease, location, etc.). Identify and characterize gaps and challenges.

3.2.3 Emerging technology analysis

Understand and characterize a new resource.

3.3 Tertiary use cases

3.3.1 About

Learn about the database, its team, funding, etc.

3.4 Non-use cases

3.4.1 Evaluation

The tool does not evaluate or verify the resources described. That is, there are no recommendations provided, only information. The catalogs include first-party information only (i.e., provided by owners/developers). The catalog maintainers do not perform evaluations, and the catalogs do not include third-party evaluations of information or claims from owners/developers.

These activities are beyond the scope of the current project.

4 Personas

This section is a comprehensive listing of BRD personas; that is, for whom are we designing? Within each category, no ordering is implied.

Definitions are similar to show for the use cases above:

- *Primary personas* are the main users of the tool; the work they do supports key deliverable capabilities. They are the main focus of design and usability testing.
- *Secondary personas* are other users for whom the tools should be relatively useful. We will think about these personas and try not to cause undue obstacles for them, but they are not the focus of our work and will receive limited testing.
- *Non-personas* are explicitly unsupported by the tools.

These lists are as short as practical; we favor a few representative personas rather than a long list with relatively minor variations.

4.1 Primary personas

4.1.1 Gert the global health analyst

- **Organization:** National or global health organization; e.g., CDC, HHS, WHO, OIE
- **Goals:**
 - Build and maintain situational awareness regarding a specific region, disease, or outbreak.
 - Communicate situational awareness and recommendations to decision makers.
 - Understand the resources that are available with respect to specific possible scenarios. That is, given a particular crisis (real or imagined), understand which tools are available to respond to that crisis.
- **Education:** M.S., Ph.D., or M.D. in epidemiology, public health, or medicine
- **Behavior/attitude:** Studies diverse information about disease on a daily basis. Wants to understand things deeply, but may be overworked or rushed, particularly when major situations are developing.
- **Tech savviness:** Moderate. Uses computers throughout her work, but is not interested in technology for its own sake.
- **Knowledge of disease surveillance:** Very high; this is her core professional training.

4.1.2 Harvey the U.S. agency analyst

- **Organization:** DOD, NCMI, DHS, etc.
- **Goals:**
 - Assess biological and health threats to the general U.S. population as well as armed forces in the U.S. and abroad.
 - Efficiently communicate these assessments to decision makers.
 - Integrate classified and unclassified information while carefully following security requirements protecting the former.
- **Education:** Varied. Highly proficient in area of expertise, this may be a class of diseases, a class of threat scenarios, geographic area, etc.
- **Behavior/attitude:** Feels constantly “under the gun” to provide reliable information as quickly as possible.
- **Tech savviness:** Moderate to high.

- **Knowledge of disease surveillance:** High. He may have core professional training in this area or may have been on-the-job trained from a similar area. May have responsibilities unrelated to disease surveillance.

4.1.3 Katia the local public health practitioner

- **Organization:** City, county, or state level public health agency
- **Goals:**
 - Build and maintain situational awareness regarding any diseases which are causing current or potential local problems.
 - Make decisions about local strategy and specific local interventions.
 - Explain and justify these decisions to local politicians and the public.
- **Education:** B.S. or M.S. in public health.
- **Behavior/attitude:** Focused on local problems and local solutions; less interested in the nationwide or global picture. Overworked and under-budgeted. Committed to her responsibility, but her department has suffered from multiple rounds of budget cuts and is understaffed. Wants to quickly complete her tasks and move on to the next thing. Lacks budget to modify models or perform complex parameterization; i.e., she needs something already tested that is ready to go.
- **Tech savviness:** Moderate. Uses computers throughout her work, but is not interested in technology for its own sake.
- **Knowledge of disease surveillance:** Moderately high. Has broad professional training in a variety of public health issues and intervention strategies, but does not specialize in infectious disease.

4.1.4 Jose the physician

- **Organization:** Any; e.g., US Armed Forces or private practice²
- **Goals:**
 - Understand his individual cases in a wider context.
 - Decide whether to report a given case or set of cases to the authorities.
- **Education:** M.D.
- **Behavior/attitude:** Overworked. Wants to quickly decide and move on to his next patient. Mostly focused on his own patients, with “big picture” issues being a lower priority.
- **Tech savviness:** Moderate. Uses computers daily because he has to, but has little patience for them and would prefer to get back to doctoring.
- **Knowledge of disease surveillance:** Moderate. Has core professional training in medicine, but it is focused on the individual.

² In principle, these are rather different. For example, in many countries, a military base physician may have superior resources to a private practice doctor. However, these distinctions are expressed by different queries, so different personas are not needed.

4.2 Secondary personas

4.2.1 Lee the data curator

- **Organization:** Private contractor, university
- **Goals:**
 - Add new content on request of sponsors.
 - Keep existing content correct and up to date.
 - Promote the value of well-maintained data.
- **Education:** B.S., M.S., or Ph.D. in public health, epidemiology, or a related field.
- **Behavior/attitude:** Busy with other things. Concerned about maintaining resources (time, funding, personnel) for ongoing data curation vs. new features and projects.
- **Tech savviness:** Moderate. More concerned with information quality than the technical means of accomplishing this.
- **Knowledge of disease surveillance:** Moderate.

4.3 Non-personas

4.3.1 Emily the decision maker

Decision makers are indirect users of the BRD. They will rely on reports, presentations, etc. prepared by the direct users noted above.

4.3.2 Fiona the reporter

News people will rely on the above personas for a more digestible view of what is going on.