Notes for OTEM Development (within EYRIE) updated 12.Feb.2020

EYRIE

(as described explicitly in IRI business plan and elsewhere, and as described in prior technical terms within Oasis World and EcoVita(1) (AgroIntel) documents from 2017-2018)

The underlying system architecture of EYRIE is that which was previously designed for EcoVita applications and in particular AgroIntel; it includes the following (see mirnovas-ev-tech-business-unified-summ-public-03jul18 and other 2017-2018 docs):

- CHANT/BANYAN in background (Cooperative Heterogeneous Asynchronous Network Transprocess)
- ATHOS (Adaptive set-Theoretic Herarchical OS)
- DAIR (Dynamic Allocation of Intelligent resources)
- HASP (Heterogeneous Adaptive Surface Processing)
- HORUS (Hierarchical Organized Reasoning and Understanding System)

and

- This is how data gets entered (by individual online entries; i.e., besides by bulk and different programs)
- This is how data gets seen visually, in map formats

EYRIE also incorporates a basic environment for interactive communications (COMET/COMEET), as has been specified in 2018 and early 2019 for Terra (Oasis World). This also incorporates elements of Nomad Eyes.

A major new part of EYRIE for data acquisition and organization/optimization of resources is OTEM.

[figures here to generate – the system architecture, bringing in the above components]

Open Tracking Epidemiological Map (OTEM)

(a specific first-version of what can become an OHM (Open Health Map) or something similar)

Purpose

Enable the collection of voluntary free-form data contributions by individuals and institutions that provides information resources that can be used in assessments and forecasts of epidemiological events (including actual and potential viral/bacterial infections, probable contacts, potential biopathogen mutations) and healthcare resources (including availability of diagnostics, medicines, medical care supplies, clinical facilities, transport services, and other response-related topics).

There are twelve (12) primary categories of information, some of which pertains to individuals who may or may not be at risk of a given disease and some of which pertains to institutions and sites (locations) of medical and other healthcare service provisions.

With respect to identification data for given individuals, a security system is employed that enables privacy assurance and confidentiality. This system is based upon multi-layered use of userid and password schemes coupled with physical separation of critical security data (userid and password and select other data) from the OTEM database and maps which are openly accessible to any user.

Note that OTEM encompasses information about people, groups, locations, regions, and it is not only about health/disease conditions but about resources, supplies and activities-in-process. It is quitre comprehensive and of use to many, in actuality all, types of persons and forces at work in epidemiological and public health response and treatment.

OTEM is:
O for "Open" – it can be used by literally anyone – not only "professionals" - and certain parts can be accessed and viewed by anyone, although certain other portions will be reserved for medical and healthcare professionals.
T for "tracking, tracing, and traffic" ("trafficking" of diseases and conditions)
E for "Epidemiological" – it is focused upon that health matters which can be epidemiological in nature and effects.
M for "Map" – it is built upon and produces maps

OTEM is implemented and built-upon OSM – Open Street Map – http://openstreetmap.org

OTEM-Interface (OTEMI)
This application is built upon existing GUI forms and DB transfer/entry.

The main form generates different data elements, with both static and dynamic fields, based upon the selection of these elements by the system design/programming team. The OTEMI application takes these selected elements and arranges them, and the team can rearrange them graphically by dragging around the screen template. When done, the form is ready for use in multiple venues (e.g., browser page, android app, iPhone app).

At the back-end, the form is ready for packaging whatever data is collected and sending it to the appropriate OTEM database, and from that, it goes into the appropriate OTEM map.

[figures here to generate – design-process for OTEMI forms, and data flow showing entry into form and transfer into DB and map]

Each OTEMI entry is characterized by the following:

Static info fields
Text description – what text is to appear.
Voice description – short audio transcript that is played if the button for it is clicked.

Dynamic (entry) info fields
One or multiple may be appropriate for different data elements – the developer selects these choices when setting up the form:

text [standard]
voice [if appropriate to collect an audio input and change into text automatically]
(the generated text is then displayed in the form and user gets option to change it)
checkbox – select multiple choices
button – select one choice
slider – range from blue to red (low to high, min to max)

For each entry field, it is specified what values can be entered, and thus, which selection/entry items to use

When a form is filled, then it applies its correction algorithm, if any, and when the {enter/done] choice is made, the inputs are put into the DB update app.

OTEM Data Structures - the Twelve Data Elements within OTEM

These 12 types comprise the bulk of "public, open data" that is being collected and which will be employed within certain facets of EYRIE, in particular, everything that can be loosely described (based upon previous terms and projects) as CRAIDO, RAPID, etc. This also draws in early/contemporary Nomad Eyes work from the 2000s.

See below for user/interaction classes (types) – who uses what, who can access and use what.

I. Individuals and Groups

Users: Class-1, Class-2

[1] Symptomology and health history

Qualitative and/or quantitative listing of symptoms
Health and vitality assessment based upon questions
This section is the most "common" across all OTEM applications, but even herein will be some variations since depending upon the health context, there will be some differences in symptoms and histories that will matter.

Interfaces for all questions:
Text
Voice-to-text (same as in Google, Android, etc.)
Color-coded slider bars (spectrum from dark blue (no, minimal or OK) to red (maximal, intense, not-OK)

Need to capture both the symptoms and their temporal relations with one another (concurrent, preceding, sequential). This must be done in the design of the input form.

How to do this? Graphically, if possible. Or to ask the question, each time, for everything: "are you feeling this now?"

Fever

Headache (where, as specific as possible)
Sinus congestion
Runny nose, mucus, phlegm
Sore throat (upper or deeper)
Cough (throat, upper chest, lower and deeper)
Difficulty breathing
Difficulty walking
Difficulty sleeping/waking

Pulse (number or slow/rapid)
Blood pressure
Palpitations and irregularities of heart
Thirsty
Hungry

Stomach pains
Intestinal pains
Vomit & freq
Diarrhea & freq
Constipation & freq

[2] Cohabitation and close/frequent contacts

Number, sex, and ages, general-health-conditions
Names or other identifiers [optional]

Also fairly common across all OTEM applications.

[3] Travel Space

(where and how – places, routes, methods, contact descriptions)

Options
Places, locations
[1] expand a circle from a pin-point on map, that's all
and/or
[2] draw lines which can be 1-way or 2-way by arrowheads
and/or
[3] pinpoint places as locations or named locations (e.g., buildings, campuses, districts, etc.)
and/or
[4] enter text with names of places

[optional] enter time information – e.g., when the person was there

Also fairly common across all OTEM applications.

[4] Environment Space

Options
[1] home/work environment description – humid/dry, cold/warm/hot, characterization of air circulation and very importantly, air circulation mechanisms if employed (e.g., pipes and ducts within large buildings)
entry is by text or selecting buttons (round or checkbox) or color-sliders

[2] overall physical environmental descriptors
(we do not need climate/weather info – we can access all we want for that from other sources)
entry is by text or selecting buttons (round or checkbox) or color-sliders

Also fairly common across all OTEM applications.

II. Diagnostics and Detection

Users: Class-3 - This is reserved for medical and system personnel

[5] RT-PCR and other apropos diagnostics

Locations – basic OSM entry methods
Procedures – text entry or icon selection
Availability (incl staff to run the instruments and operate patient-sessions)
– checkboxes, buttons, sliders
Resources and supplies – same as for availability but with some provisions for entering numbers or giving ranges by use of sliders

There will be some variations across OTEM applications here.

[6] Hospitalization and Patient Care-givers

Locations (same as for [5] Diagnostics, above)
Procedures
Availability (incl staff to run the instruments and operate patient-sessions)
Resources and supplies – all the standard types, for use with both patients and also providers/staff.

Minor variations across all OTEM applications.

[7] Medicine and medical supplies

probably the same as for [5] and [6] above
This will vary according to the specific instance-uses of OTEM (e.g., medicines applicable to the focal disease(s) and to others that can be associated or expected to be in context).

Some variations across all OTEM applications.

[8] Environment-space for treatment centers
[more – see hand-notes]

Concerns to discern:
- crowded conditions
- long waits
- congested stuffy air or good fresh air circulation

Also fairly common across all OTEM applications.

III. Analytical Results
Users: Class-3, Class-4

[9] Diagnostic Results
This process maps individuals and groups with actual and probably diagnostic results.
This is a critical part of the operations EYRIE and its outputs are put in visible format into OTEM.

Classification according to pathogenic agents detected and other diagnostics (e.g., non-ID conditions)

Significant: diagnostics resulting in other correlatable diseases and in neutral-conditions (e.g., a simple coronavirus "common cold" or a chronic minor problem) and null-conditions (nothing pathogenic at all, but psychosomatic or otherwise confused, worried, but not a health issue – there will be such!)

Filtering out of deliberate pseudo-cases as well.

There will be significant variations across OTEM applications.

[10] Assessment of Infection Incident Parameters
Goal here is to indicate in clear, simple, easy-access, quick-understand terms – visually and with text and details accessible – where the critical action is today and where it is likely to be tomorrow and henceforth.
This is a big part of the outcomes of EYRIE, expressed in OTEM.

Focus upon:
- the build-up and circulation/dispersion in the local and also distant populations of increasing numbers of potential transmitters
- activities attributable to vectors and super-spreaders, as a highlight-factor, for instance.

These params are yet to be refined as to what to include and not.

There will be significant variations across OTEM applications.

[11] Mutation-indicative anomalies

Data sources are the PCR and other patient-specific collected sources of gene seq data.
MADIT type analytics

The outcomes here are to show where – geographically and with access to particular subjects (persons) – are the potential instances of mutations, and categorized/classified/ranked according to potential risk of increasing transmissibility and virulence including lethality.

There will be significant variations across OTEM applications.

[12] Environmental correlations

Links with weather in particular, but also social factors including expected/projected higher-number gatherings of people, higher levels of travel, etc.

“Environment” here is not only physical, static, but social, dynamic.

There will be significant variations across OTEM applications.

--- These comprise the Twelve Data Elements ---

User Classes

Usage privileges as indicated above are upwardly comprehensive; i.e., if Class-1 can use it, so can Classes 2, 3, 4... If Class-3 can use it, then so can Classes 4, 5... but not Classes 1 or 2.

[1] Anyone – the general and complete public
** some basic type of registration, which can be done like with many websites, by using one's pre-existing account somewhere (e.g., Google, WhatsApp, WeChat,m etc.), or which can be done simply “fresh and new”, the usual/typical way

[2] Persons with some type of verifiable group management authority (e.g., principal at a school, department head in some organization)

[3] Medical professionals – doctors, nurses, administrators

[4] Distinct system/admin management personnel

[5] Overseer-developers and technical admins

(Note that persons who are software developers can access their respective domains and regions but as far as the full operating system, they must use it as members of one of the special defined clsasses as listed here above.)

OTEM Editors
There are two types:
(1) Technical Editors, for map developers and managers, and these consist of those developed and used within the OSM community, in particular two:
ID - “the easy to use editor found per default on the "Edit" button of the OpenStreetMap homepage, and is ideal for quick editing contributions. It runs in your browser and downloads data automatically as you look around.” [1]
and
JOSM - “a highly expandable standalone Java desktop application which allows editing more data at once, using more advanced tools and direct access to data at cost of increased complexity.” [1]

(2) General User Editors, specifically designed for literally anyone, aiming to be “friendly-functional” for people with minimal computer and internet skill and experience, and essentially focused upon use through a phone app. We begin with Android and then iOS, and then something for standard computers.

NOTES

[1] These texts are taken from various pages @ www.openstreetmap.org .

Notes to self, mainly:

Not-only nCoV – Precisely why you should send our task force to both Geneva and China

People in key places and organizations agree and we can explain details, concisely, quickly.

Our team goes back to the 2000s, pre-H1N1. Worked with NBAS, several DOD/DHS Biothreat/Biosense efforts. Some priors: Nancy Cox, Martin xxxx, Margaret Chan

First EUA and CLIA for some things @ H1N1 and other influenza.

Ready, recommended, assertive.

Can start doing things You want to see happen.