Identification and Maturation of User Requirements for the Next Generation Analyst Review

(ie. "dbloc3" User Requirements)

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OBJECTIVE: To specify analyst software requirements that help us accomplish the regular seismic analysis tasks that we need to do.

I. Why Write User Requirements?

II. Define what a use case scenario is.

III. Core Problems

IV. Fundamental Differences
   A. Differences in use case scenarios
   B. Differences in network characteristics and use

V. Feedback
   A. 1. Primary mandate?
   B. 2. What are your needs?
   C. 3. What works well?
   D. 4. What doesn't work well?

I. Why User Requirements?

Without quality requirements

"it's like playing video games. You get to the last level, get killed, and have to start all over again."

– *Jackie at age 10, granddaughter of Ivy Hooks.*

User Requirements

- Describe user goals or tasks that one must be able to perform with the product.

- Emphasize user tasks, not superficially attractive feature.

The Process

1. Scope the product by defining needs.
2. Develop operational scenarios.
3. Identify user interfaces between your product and the rest of the world, clarifying the boundaries, inputs, & outputs.
4. Write requirements to guide product design.
5. Capture rationale behind each requirement.
6. Level requirements according to system and system subdivisions.
7. Assess verification of each requirement.
8. Format requirements and supporting documentation.
9. Baseline requirements.

Vision and scope

Scope Item	Example
Need	To analyze seismic data to accomplish mandated tasks
Goal *What do you want to accomplish on the way to meeting the need?*	
Objective *Expand on how you can meet the goals*	Optimized for efficiency Easy for novice users Transparency of use New users uptions – what do each of the buttons do (hover over button – get explanation) Expanded seismic analysis – beyond just locations To take into better account the science of seismology
Mission	
Operational Concepts *Outline the products normal operation*	

II. Define "use case scenario" or "operational scenario"

- A series of scenarios for how "dbloc3" might behave and be used under the following circumstances:
  - Everyday Use
  - Beyond Basic Use
  - The Abnormal
- Capture the rationale. Ask "why".

III. Core Problems

- Locate events
- Compute/assign magnitudes
- Associate with external agency origins
- Source identification
- Hazard potential
  - Focal mechanism
- Quality control
- Not enough money, not enough time
  - Need to be efficient & retain or increase accuracy

IV. Fundamental Differences

A. Differences in use case scenarios
   i. External events that drive use
   ii. Internal needs

B. Differences in network usage

External Events That Drive Use

Great earthquake

Volcanic eruption

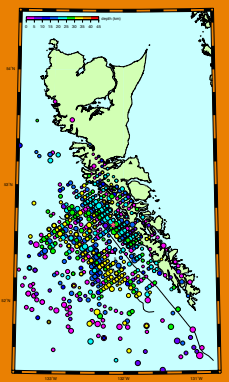
Mud volcano

Meteorite impact

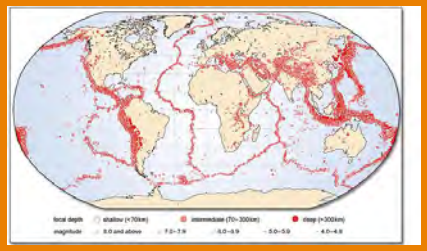
Supersonic jets

Mine blast

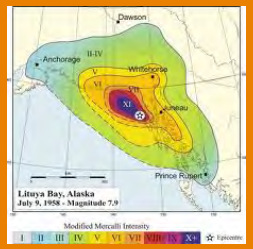
Significant aftershock sequence



Local/Region/Teleseismic earthquakes



Felt earthquake



Internal Use

- Quality control of waveforms
- Seismic Catalogue creation
- Research
- 24-7 Operations
- On-call duty
- Education

IV. Fundamental Differences

A. Differences in use case scenarios
   i. External events that drive use
   ii. Internal needs

B. Differences in network usage

IV.
B.Differences in Network Usage

i. Alaska, US (AK)
   a) Overwhelmed with # of earthquakes due to frequent large events.
   b) Significant event response

ii. Canada (CN)
   a) sparse network across a huge geographical area with densification in regions of frequent seismicity and high population
   b) send data to CTBT (run IMS stations)
   c) 2 offices, 3 time zones apart – analysis in both offices

iii. USArray (TA) is a grid with large number of stations changing weekly.

iv. Austria (OE)
   a) small footprint (850 km x 400 km)
   b) lower rates of seismicity
   c) more cultural noise in some locations
   d) NDC data centre – receive data from CTBT

Differences in Network Usage (continued)

- Abu Dhabi
- Algeria
- Australia
- Azerbaijan
- Dubai
- Antarctica (run by Germany)
- Italy - Nat'l accelerometer network (DPC)
- Italy – OGS
- Kuwait
- Morocco
- Oman

V. Feedback

1. Primary mandate?
2. What are your needs?

3. What works well?
4. What doesn't work well?

1. Primary mandate?

- Report to local civil protection (civil defense)

2. What are your needs?

- Easy way to click on an event from a map and get to analyze it.
- Need to inspect wf data for quality control

3. What works well?

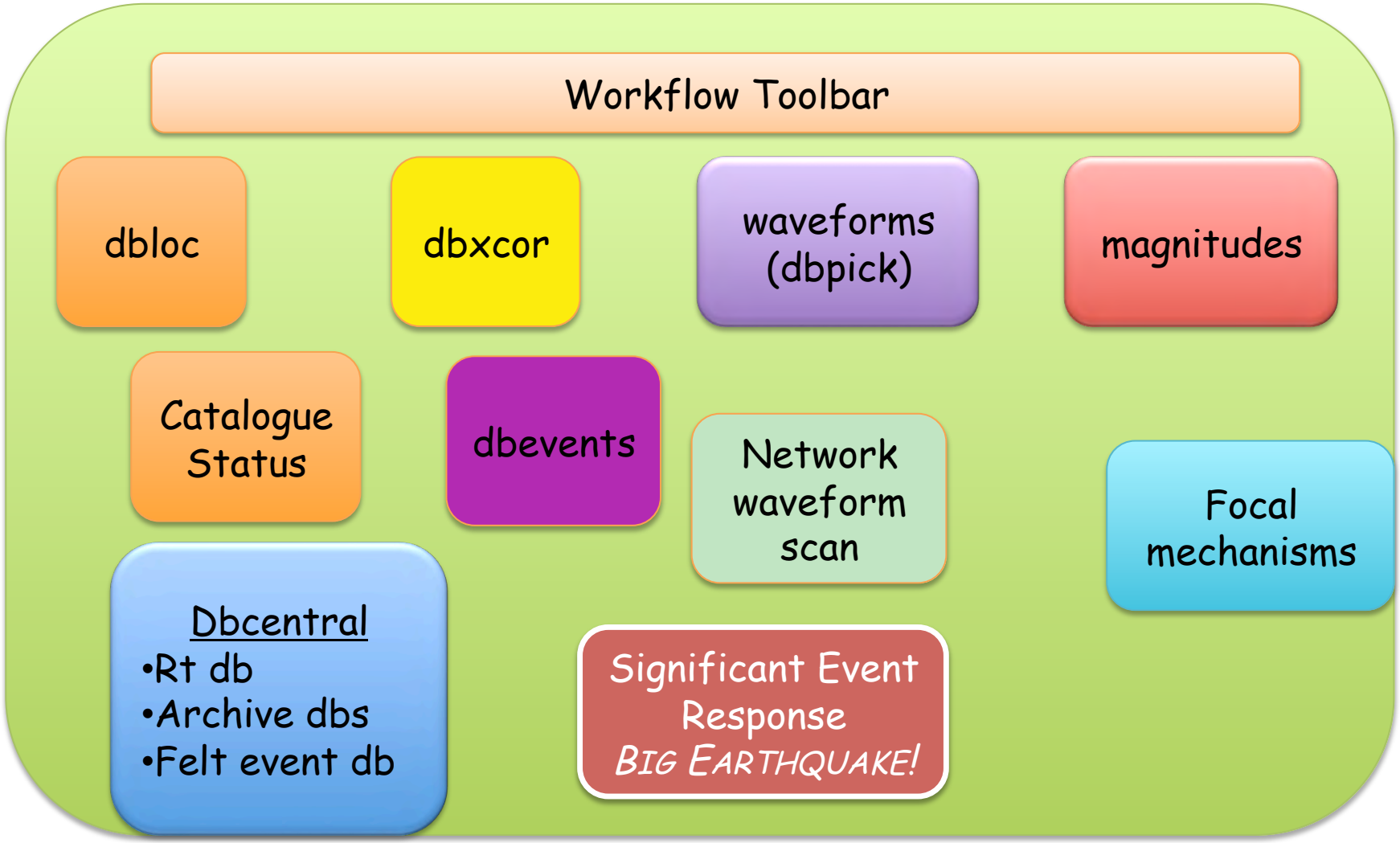
4. What doesn't work well?

"Storyboard" Examples

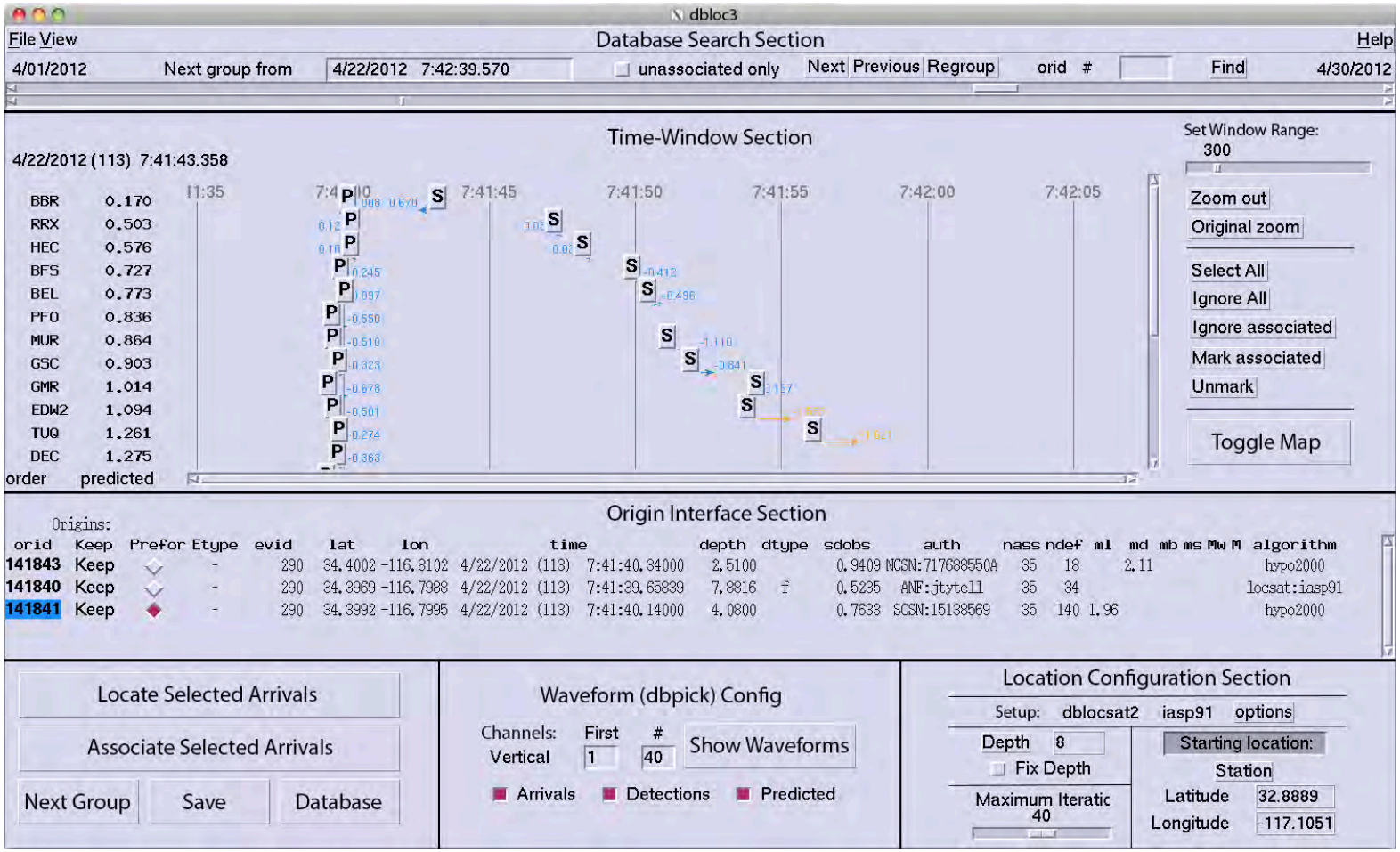
- Pictures of what tools might look like to accomplish particular tasks.

- Flow diagrams that illustrate how a series of tasks link together to accomplish a particular goal.

Dbloc Dashboard



Dbloc window



Catalogue Processing Status

(an example - needs more thought)

Daily review

2012 Mar 3

No. orbassoc events = 5

No. located events = 12

- ❑Network scan
- ❑Wf quality control
  - ○Timing
  - ○Noise levels
  - ○Glitches
- ❑Calibration
- ❑Picked first motions
- ❑Pick amplitude & period
- ❑Moment tensor solns
- ❑First motion focal mechanisms

Monthly review

- ❑2013 Jan
- ❑2012 Dec
- ❑2012 Nov
- ❑2012 Oct
- ❑2012 Sep
- ❑2012 Aug

Send data to ISC, EMSC, etc.

- ❑2013 Jan
- ❑2012 Dec
- ❑2012 Nov
- ❑2012 Oct
- ❑2012 Sep
- ❑2012 Aug

Managing a/s sequences

- ❑Adding in a/s deployment wf data & phase picks
- ❑Identify a/s: assign origin to unlocatable a/s, calculate magnitude

Improve trackability of catalogue data

- Filter used
- Catalogue quality control…

The End