THOUGHTS ON THE QIBA PROCESS: PROFILES, UPICT & MEASUREMENTS

Maturation of a QIBA Biomarker

- Exploration Phase ("Clarification")
  - Outline the nature of the biomarker, and the intended clinical application
  - Work out how it would likely be implemented
- Clinical Trial Phase ("Regularization")
  - Converge on elements of Standard Practice
  - Usable in controlled environment
  - Still some "hand-crafting" involved?
- Clinical Practice Phase ("Industrialization")
  - Nail down Details necessary to be robust in general use
  - i.e. drive out any impeding variance and complexity
  - This is the ultimate goal

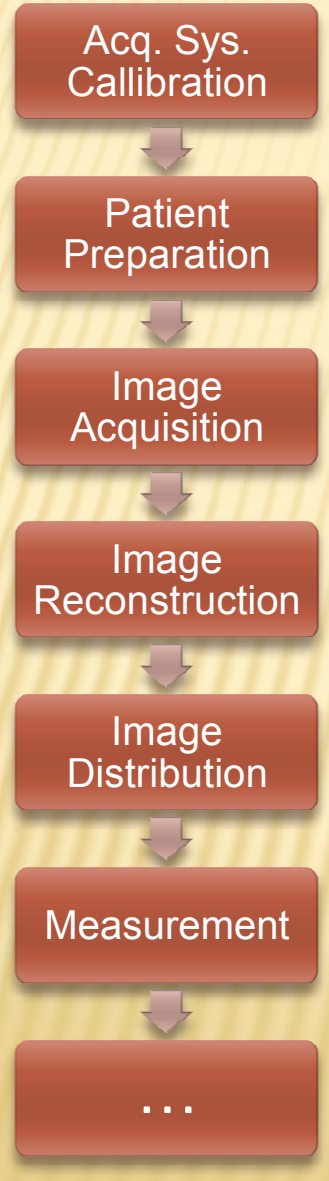
Work in each Phase

- Exploration Phase ("Clarification")
  - Select a "Placeholder" Claim to set our goal/ambition
  - Sketch Profile to ensure Groundwork addresses key details
  - Most Groundwork happens here
- Clinical Trial Phase ("Regularization")
  - Stabilize nature of Claims (precision still to be refined)
  - Document clear protocol (UPICT)
  - Publish draft/partial Profile for Clinical Trial
- Clinical Practice Phase ("Industrialization")
  - Finalize nature and precision of Claims (based on GW & CT)
  - Make Details stable, clear, implementable, testable

Document Structure in each Phase

- Exploration Phase ("Clarification")
  - Used by QIBA to coordinate groundwork/development
  - Sketched up on Wiki
- Clinical Trial Phase ("Regularization")
  - Used by Clinical Trial as raw material; adapted by P.I.
  - Should correlate closely to UPICT for easy review/publication
- Clinical Practice Phase ("Industrialization")
  - Used by vendors to implement compliant products
  - Used by users to understand what profile promises and what they need to do to achieve it.
  - Used by Connectathon to define tests
  - Needs appropriate structure and "shall" language

ACTIVITY FLOW DIAGRAM



Profile Details:

- **Define the sequence of Activities**
- **For each Activity:**
  - **Define the Actors (Participants)**
  - **For each Actor:**
    - **Define Compliance requirements**

REQUIREMENTS TABLE

Implementers need to know what they need to do to comply.

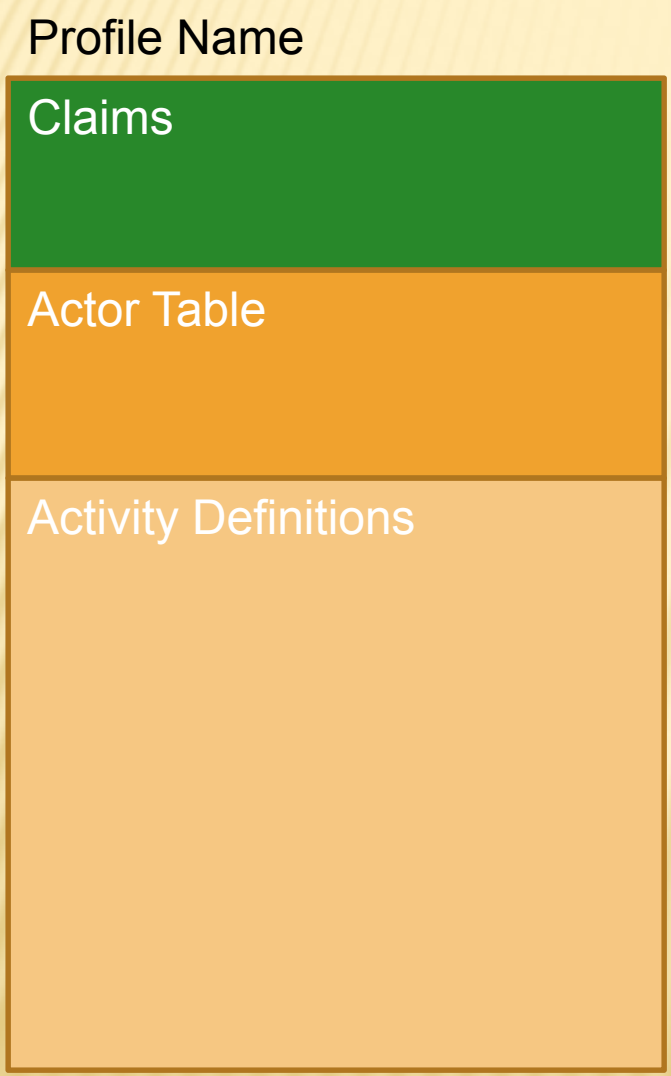
Actors	Activities Required to Claim Compliance
Acquisition Modality	○ Acquisition System Calibration ○ Image Acquisition ○ Image Reconstruction ○ Image Distribution
Measurement System	○ Image Distribution ○ Measurement ○ Measurement Distribution
Radiologist	○ Measurement ○ Interpretation
Modality Tech.	○ Acquisition System Calibration ○ Image Acquisition
Reporting System	○ Measurement Distribution ○ Image Distribution
…	

ACTIVITY DEFINITION

Measurement

- Participants: Measurement System, Radiologist
- The Measurement System shall be capable of:
  - making manual RECIST measurements
  - making manual volume measurements (by contours? Semi-automatic thresholding? …)
  - automatic measurement of longest diameter within ROI
  - …
- The Radiologist shall be capable of:
  - Using the Measurement System to measure all nodules in test set X1 with an average error of less than 10% and no more than two errors of greater than 25%...

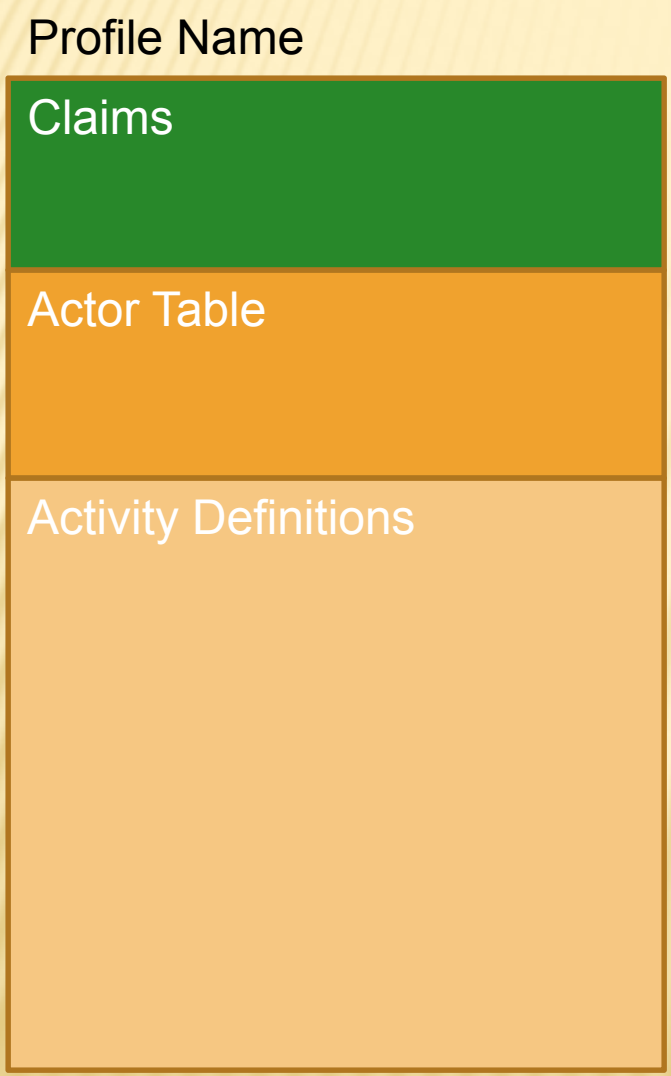
"INDUSTRIALIZATION" OF BIOMARKERS



User View:

- Will it do what I need?
- What stuff do I need to get started
- What do I have to do?

"INDUSTRIALIZATION" OF BIOMARKERS



Vendor View:

- Why do you want me to do this?
- What does my product have do?
- Specifically, what do I have to implement and what will I be tested on?

RESUABILITY

- Many Profiles will have similar flow diagrams
- Many Activity Definitions can be re-used in total or with slight adjustments
- Many Activity Definitions provide examples of the types of issues to address and approaches for addressing them
- These similarities make life easier for implementers (vendors and clinicians)