BUSINESS BLUEPRINT DERIVATION

THE INPUTS

Suzanne Barber

AWAREness System Blueprint “views” help separate concerns and conquer complexity.

Business Blueprint (Version.Release)

- BB version reflects current state of approved, verified, accepted Requirements (scenarios, functions, I/O, NonFunctional)
- BB version.release is the portion of Business Blueprint version to be satisfied at a Deployment Milestone

Solution Blueprint

- Configuration of Solutions
- Solutions selected to comply with Business Blueprint Version.Release

Deployment Blueprint

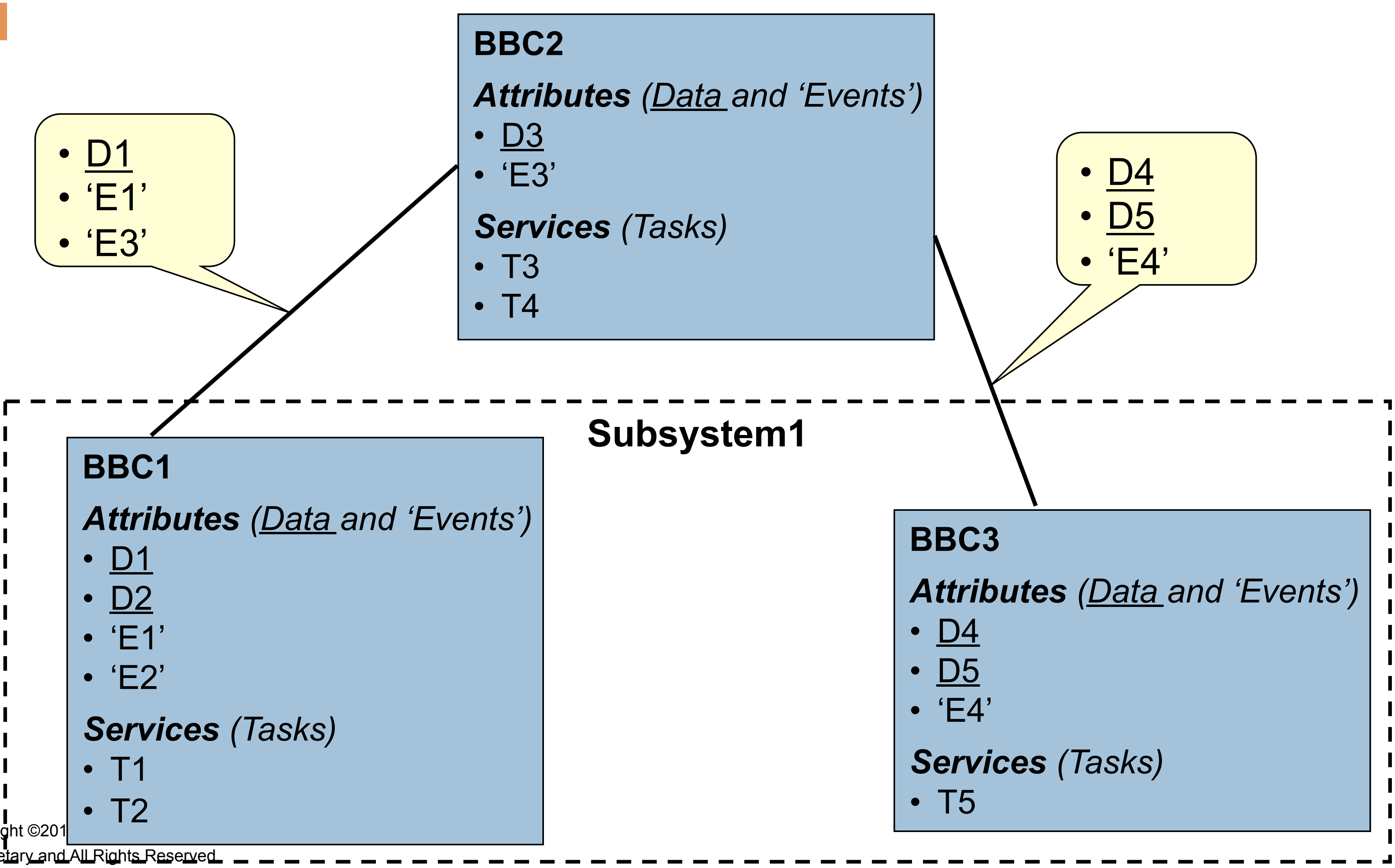
- Solution Blueprint installed in a potential deployment environment (solutions assigned to a physical environment, e.g. HW, SW)

The Business Blueprint

The Business Blueprint

- Why?
  - Provides a “blueprint” for developing a family of designs
  - Captures business requirements
  - Implementation Independent
  - Expresses an architect’s vision by prescribing systems reflecting selected qualities
- What’s in it?
  - Content
    - Allocation of functionality and related attributes (data) to components (BBC)
      - Note: Service = Task = Function
  - Structure
    - BBC relationships/dependencies based on input/output flow between functionality allocated to different BBCs

What's Business Blueprint look like? (One possible graphical depiction)



- D1
- 'E1'
- 'E3'

BBC2

Attributes *(Data and 'Events')*
- D3
- 'E3'

Services *(Tasks)*
- T3
- T4

- D4
- D5
- 'E4'

Subsystem1

BBC1

Attributes *(Data and 'Events')*
- D1
- D2
- 'E1'
- 'E2'

Services *(Tasks)*
- T1
- T2

BBC3

Attributes *(Data and 'Events')*
- D4
- D5
- 'E4'

Services *(Tasks)*
- T5

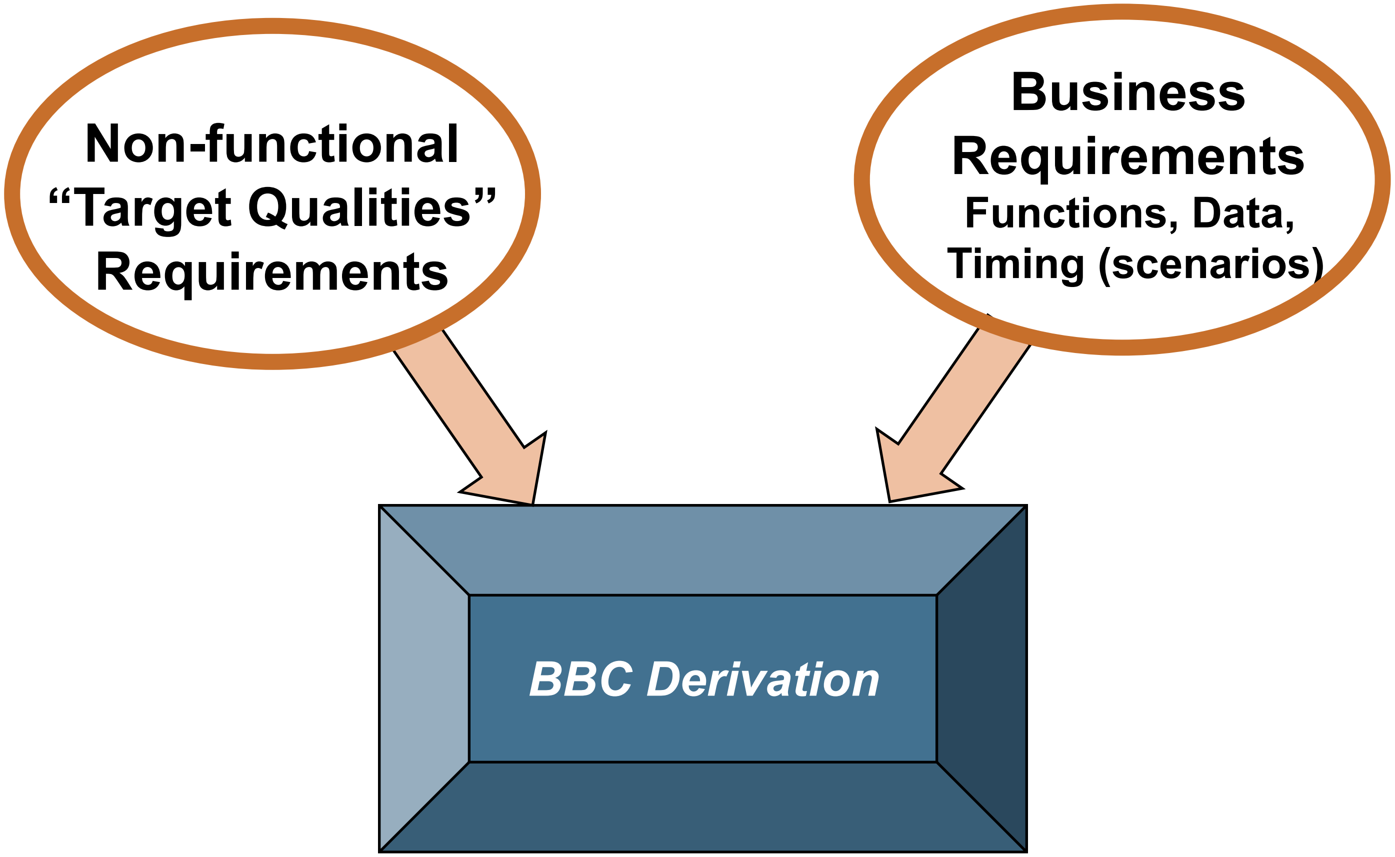
Imagine the Architect staring at a blank sheet of paper…

Where to start?

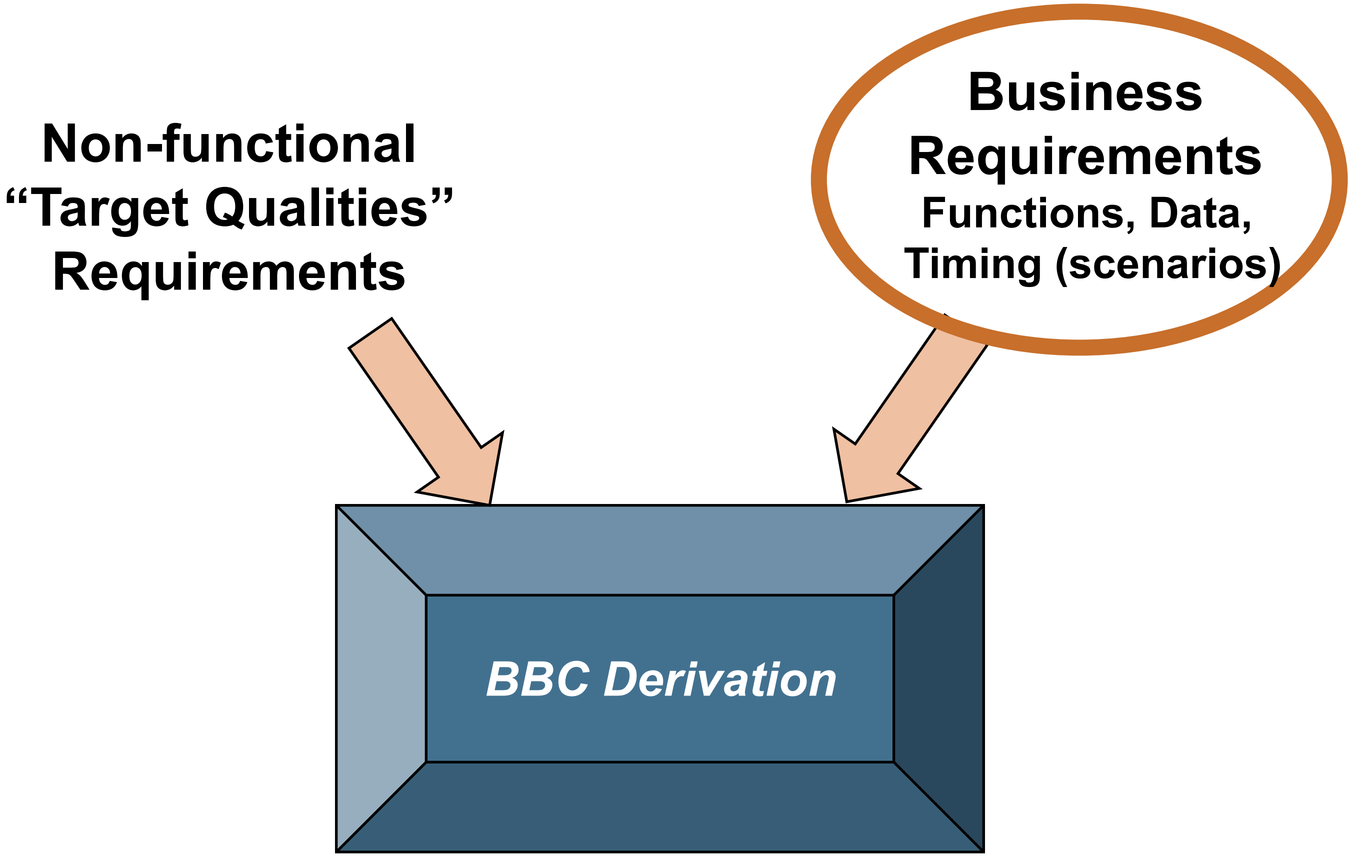
How does the architect determine the "best" blueprint? Allocation of functionality and data to components? # components? structure?

What are the measurements to evaluate the blueprint quality?

BB Derivation Process is driven by …
(1) "coverage" of business requirements +
(2) prioritization of qualities.


Non-functional "Target Qualities" Requirements
Business Requirements
Functions, Data, Timing (scenarios)
BBC Derivation

The BB must “contain” all the known, verified, and **accepted** functional, data, timing requirements.

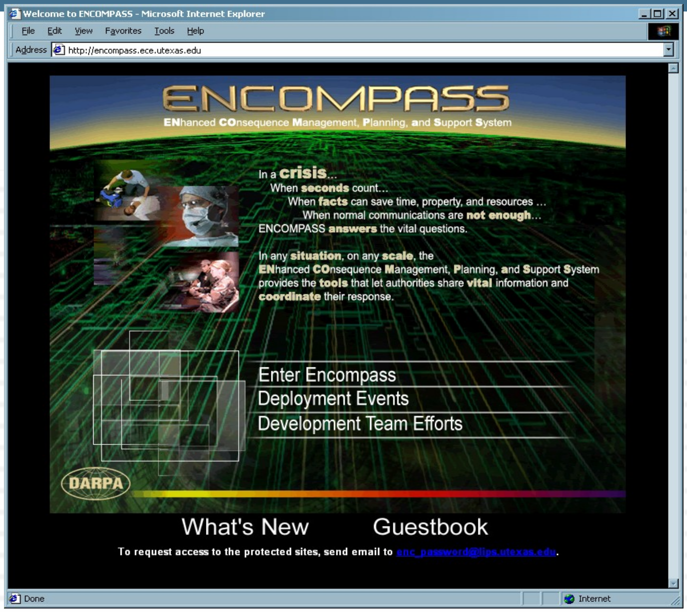


Non-functional “Target Qualities” Requirements

Business Requirements Functions, Data, Timing (scenarios)

BBC Derivation

Quick Detour for Lessons Learned


Welcome to ENCOMPASS - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Address http://encompass.ece.utexas.edu
DARPA
Done
Internet

ENCOMPASS

ENhanced COnsequence Management, Planning, and Support System

In a **crisis**...
When **seconds** count...
When **facts** can save time, property, and resources ...
When normal communications are **not enough**...
ENCOMPASS **answers** the vital questions.

In any **situation**, on any **scale**, the **EN**hanced **CO**nsequence **M**anagement, **P**lanning, **a**nd **S**upport **S**ystem provides the **tools** that let authorities share **vital** information and **coordinate** their response.

Enter Encompass

Deployment Events

Development Team Efforts

What's New Guestbook

To request access to the protected sites, send email to enc_password@lips.utexas.edu.

Welcome to ENCOMPASS - Microsoft Internet Explorer
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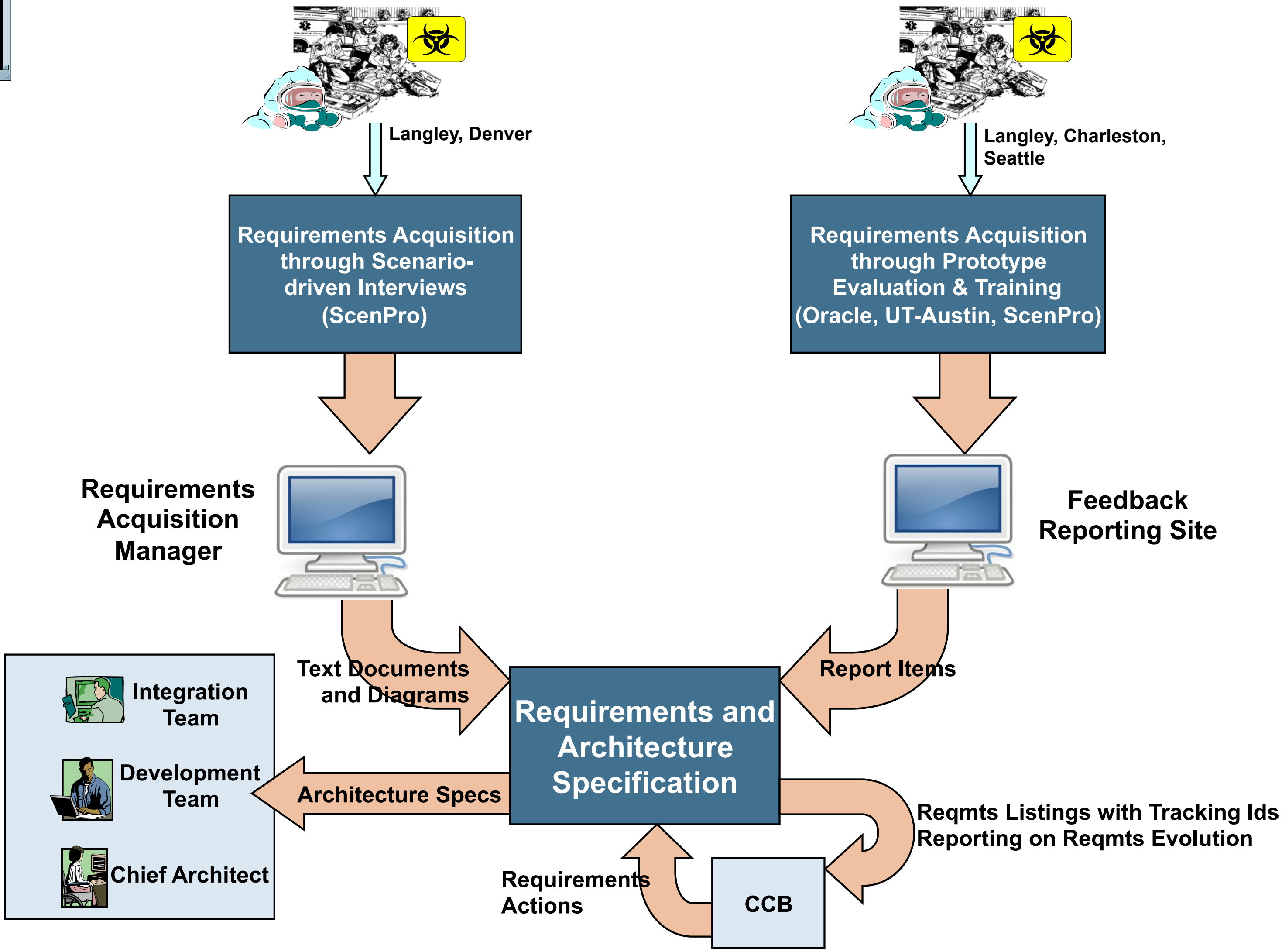
Enter Encompass
Deployment Events
Development Team Efforts

DARPA

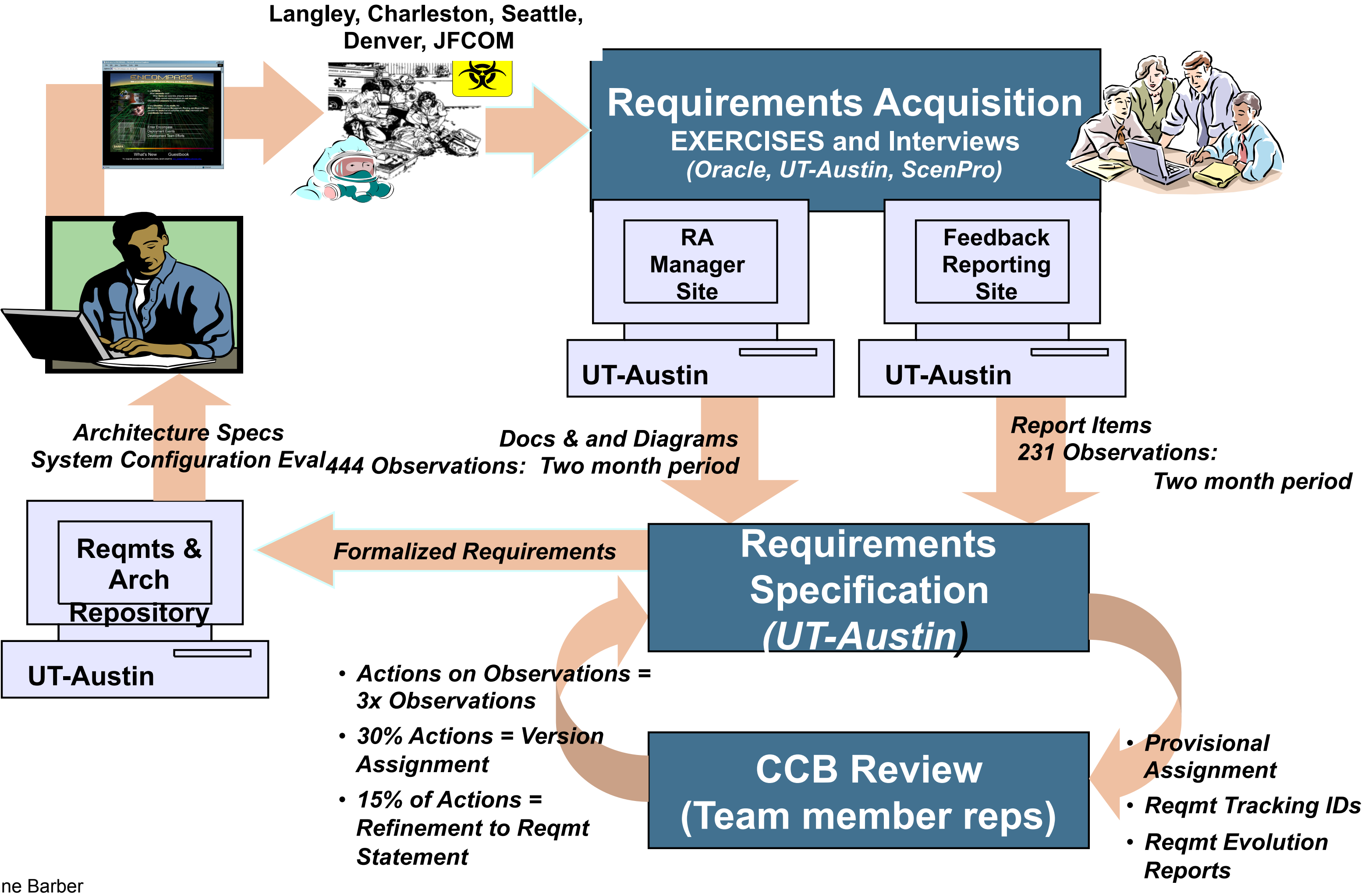
What's New Guestbook

To request access to the protected sites, send email to enc_password@lips.utexas.edu.

Requirements arrive all the time and there needs to be a central "clearinghouse."


Langley, Denver
Langley, Charleston, Seattle
Requirements Acquisition through Scenario-driven Interviews (ScenPro)
Requirements Acquisition through Prototype Evaluation & Training (Oracle, UT-Austin, ScenPro)
Requirements Acquisition Manager
Feedback Reporting Site
Text Documents and Diagrams
Report Items
Integration Team
Development Team
Chief Architect
Requirements and Architecture Specification
Architecture Specs
Reqmts Listings with Tracking Ids
Reporting on Reqmts Evolution
Requirements Actions
CCB

Scope, Evolution, and Version.Release Decision dominate decisions.



Langley, Charleston, Seattle, Denver, JFCOM

Requirements Acquisition

EXERCISES and Interviews

(Oracle, UT-Austin, ScenPro)

RA Manager Site

UT-Austin

Feedback Reporting Site

UT-Austin

Architecture Specs
System Configuration Eval

Docs & and Diagrams
444 Observations: Two month period

Report Items
231 Observations:
Two month period

Reqmts & Arch Repository

UT-Austin

Formalized Requirements

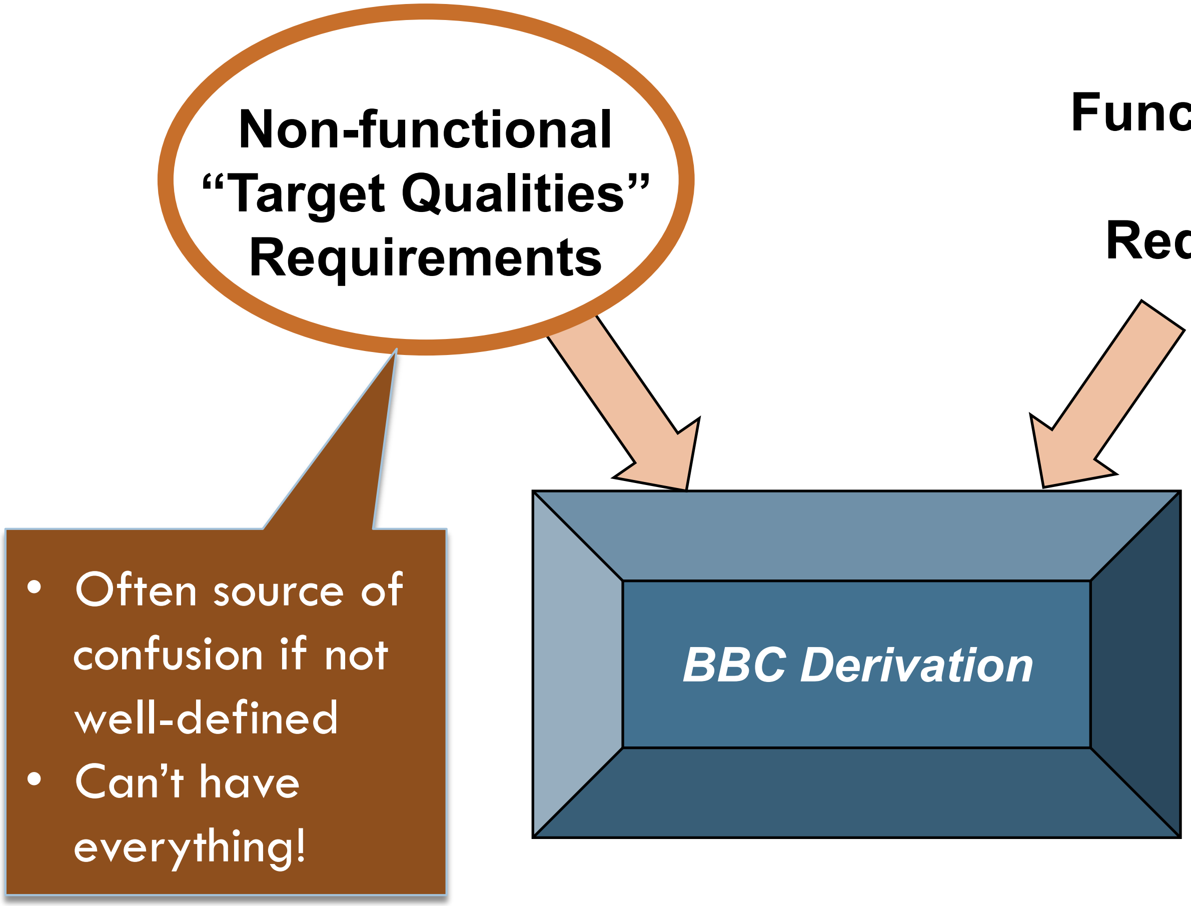
Requirements Specification *(UT-Austin)*

- *Actions on Observations = 3x Observations*
- *30% Actions = Version Assignment*
- *15% of Actions = Refinement to Reqmt Statement*

CCB Review (Team member reps)

- *Provisional Assignment*
- *Reqmt Tracking IDs*
- *Reqmt Evolution Reports*

Non-functional Requirements can/should highly influence architecture structure.



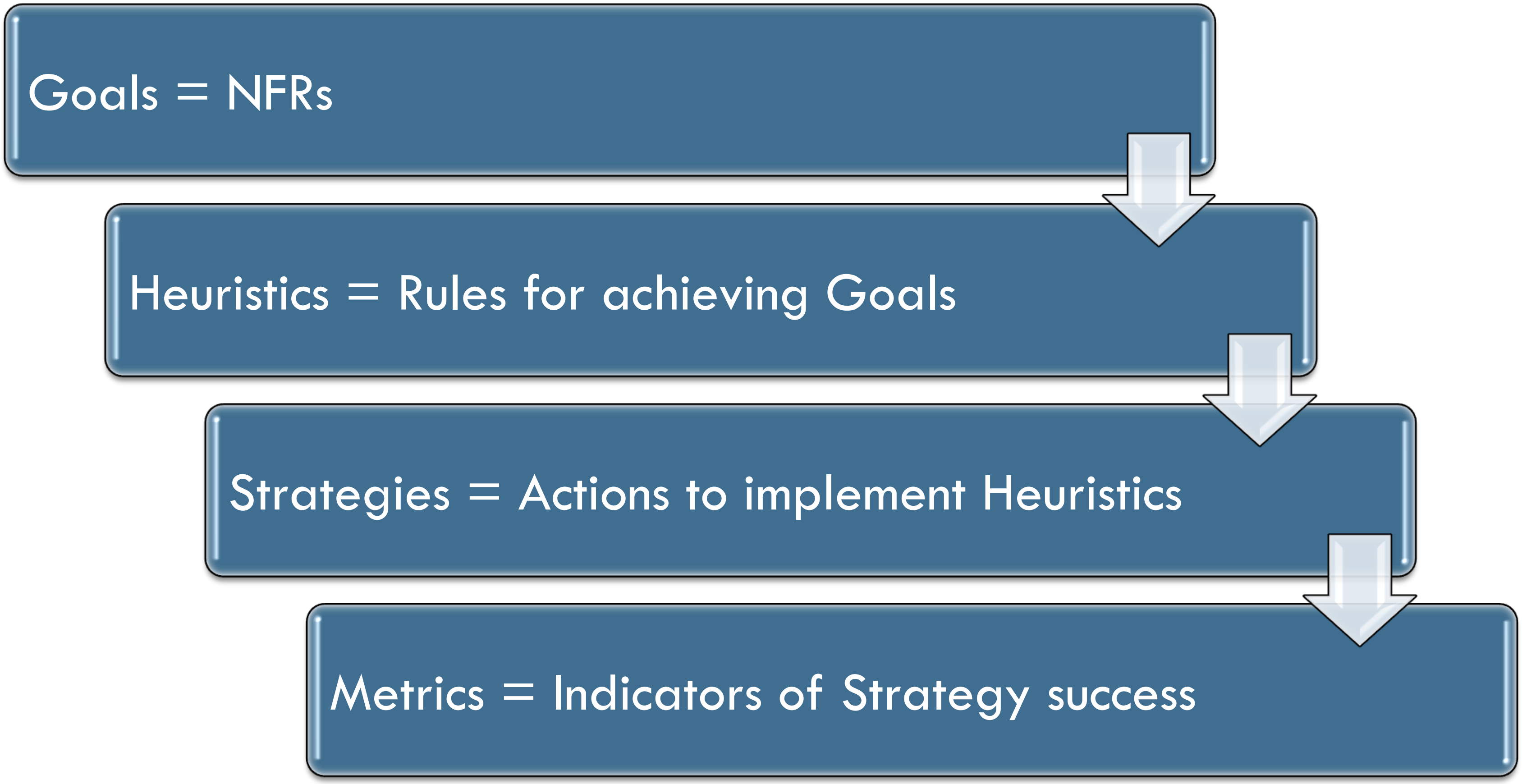
Non-functional “Target Qualities” Requirements

Functional, Data, Timing Requirements

BBC Derivation

- Often source of confusion if not well-defined
- Can’t have everything!

AWAREness methodology offers a traceable, rationale process for specifying NFRs and using NFRs to drive Business Blueprint decisions.



Goals = NFRs

Heuristics = Rules for achieving Goals

Strategies = Actions to implement Heuristics

Metrics = Indicators of Strategy success

Goal: Reusability

Heuristics	Strategies	Metrics
Heuristic H6: Maximize completeness of performers and associated services to cover all possible functionality..	***Strategy S0:*** • Create a BBC for each performer role. • Add tasks performed by each performer to respective BBCs. • Add attributes to each BBC corresponding to data resources needed for the services offered by the BBC.	• ***Metric M1:*** INCREASE Percentage of BBCs where services offered equal tasks performed by a performer role. • ***Metric M2:*** INCREASE Percentage of BBCs which contain all data resources necessary to perform services offered.
Heuristic H8: Reduce coupling to reduce dependencies.	***Strategy S7:*** • Ensure each BBC owns all attributes needed. ***Strategy S3:*** • When BBC is dependent on services offered by another BBC, absorb those services into local BBC.	• ***Metric M3:*** INCREASE Percentage of BBCs that own all data resources. • ***Metric M4:*** DECREASE Average messages passed per service invocation.

Goal: Extensibility and Maintainability

Heuristics	Strategies	Metrics
Goal: Extensibility		
Heuristic H8: Reduce coupling to reduce dependencies.	• *Strategy S7:* (see above) • *Strategy S3:* (see above)	• *Metric M3:* (see above) • *Metric M4:* (see above)
Heuristic H7: Reduce resource duplication.	• *Strategy S6:* 1. Ensure each data resource is owned by only one BBC.	• *Metric M8:* DECREASE Percentage of data resources owned by more than one BBCs.
Heuristic H10 Reduce complexity	Strategy S9: Reduce # services per class to reduce class complexity	*Metric 10:* DECREASE # services per component

Goal: Comprehensibility

Heuristics	Strategies	Metrics
Goal: Comprehensibility		
<u>Heuristic H3:</u> Reduce total number of components in BB to reduce complexity.	• ***Strategy S4:*** 1. Combine BBCs based on performer role abstractions.	• ***Metric M5:*** INCREASE Percentage of BBCs providing services associated with more than one performer role.
<u>Heuristic H8:</u> Reduce coupling to reduce dependencies.	• ***Strategy S7:*** (see above) • ***Strategy S3:*** (see above)	• ***Metric M3:*** (see above) • ***Metric M4:*** (see above)

At the end of the day, the Architect must have a defensible, rationale answer to the question…. Why does the blueprint look this way?