Contribution Structures

... Addressing the Crux of the Requirements Traceability Problem

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(a) Analysis of the RT Problem
(b) Modelling Contribution Structures

To Avoid Initial Questions...

“REQUIREMENTS TRACEABILITY (RT) refers to the ability to describe & follow the life of a requirement in both a forwards & backwards direction”

(i.e., from its origins, through its development & specification, to its subsequent deployment & use, & through all periods of on-going refinement & iteration in any of these phases)
“Post-requirements traceability is concerned with those aspects of a requirement’s life that result from its inclusion in the RS”

(i.e., requirement deployment)

“Pre-requirements traceability is concerned with those aspects of a requirement’s life prior to its inclusion in the RS”

(i.e., requirement production)

(a) Analysis of the RT Problem

- Little real progress as poor understanding of RT
- Multifaceted nature of RT problem
- Framework - pre-RT & post-RT
- Focus on pre-RT issues - informational emphasis
- Intrinsic need to locate & access personnel

See ICRE ’94 for more...
Crux of the RT Problem...

...But who can I refer to for more details?

(b) Modelling Contribution Structures

- Preliminaries
- Outline of the approach
- Relating agents & artifacts
- Roles & commitments
- Relating artifacts
- Implementation
- Experiences
- Discussion
Some Preliminaries...

- Problems:
  - Artifact-based RT
  - Coarse labels / snapshot / little use
  - Scope of concern & assumptions
- Requirements:
  - Differentiate how agents contribute
  - Account for artifact-based relations
  - Basis for modelling & reasoning
  - Acceptance issues

Outline of the Approach...

Augments artifact-based RT with contribution structures
Relating Agents & Artifacts...

- Goffman's "participant roles" → Contribution format

Artifact

Contribution relations

Principal

Author

Documentor

Qualifying Contribution Relations...

P (signatures) → Agent
Approved, Pending, Not approved...

A (sources) → Agent
Creator, Referencer, Adopter....

D (moods) → Agent
Certain, Believe, Indifferent, Uninformed...
Roles & Commitments...

- Individual & collective commitment to artifacts
- Role relations & social commitment to each other

Relating Artifacts...

- Temporal
- Developmental
- Auxiliary:
  - Containment (layering & nesting)
  - Connectivity (cohesion & coherence)
Containment: Default Contributors...

Connectivity: Authorial Trails...
Implementation...

Experiences...

- Scenarios & what they show:
  - Agent & artifact profiles
  - Original source & trails of contributors
  - Changing work arrangements
  - Possible backups
  - Many forms of social analyses
- WIP:
  - Case studies & technology transfer
Discussion...

Benefits?
- Deal with:
  - Info absence
  - Supplementary info
  - Human aspects
  - Continuous change
  - Project management
  - Education
  - Firmest anchor

Issues?
- Resistance
  - Buy-in & automate
- Accountability:
  - +ve = learn & share
  - -ve = blame & hide
- Categories
- Coverage
- Scaleability

Full Time Recap...
- Crux of RT problem is location & access of personnel
- Model “contribution structures” underlying requirements artifacts
- Use to augment artifact-based RT, provide personnel-based RT, & more...
- Most leverage with RT problem by tying PEOPLE into RT equation
For Further Details...

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