“Pre-ontology” for Communication in Construction

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Communication in construction: the context

• Main question: what are ontologies for?
  – how can they help with communication?

• Focus on on-site activity …

• Large projects:
  – succession of specialised contractors
  – coordinated by main contractor
  – often assembly of parts manufactured off-site
  – many details may need resolution
  – discussion/negotiation commonplace
    • between strangers …
Difficult.
The solution?

• Superficially, it seems:
  – standardise vocabularies
  – standardise the subject-matter
    (components and operations)
  – standardise communication tools
  – formalise human relationships

• Neat …

“…the industrialised process can only have its full effect within a system of all pervasive order and standardisation” — Konrad Wachsmann, The Turning Point of Building, 1961.
But building sites are messy …

QuickTime™ and a 3ivx D4 4.5.1 decompressor are needed to see this picture.
and in more ways than one …

• *Communication* is not neat and tidy:
  – argument that in fact the smooth operation of construction projects is dependent on slippage between formal communications
  – “rituals” and practices abound that are not easily captured in formal mechanisms
  – “dirt” in the system allows for creativity and local responses to unexpected problems
Some observations

• People often do not find it easy to cope with construction communication
• Formal procedures are often circumvented by e.g. informal sketches and the use of mobile phones
• The main contractor can have a difficult job mediating between various subcontractors
• In theory, some formalisation should help, but:
  – should not be at too specific a level
  – should accommodate differing understandings in use (which means different practices and behaviours …)
A related perspective

- Communication occurs between groups that each develop their *own conventions* …
- (even when they share the *same task*)
- … if not of terms, then *interpretation* of common terms
- Smooth when intra-group; often fails between groups
- *Process* of interaction reveals misunderstanding
- But then *negotiation* of understanding is required
- Can think of formalised ontologies as a means of revealing these differences …
- … rather than of abolishing them

A useful process

- Negotiation is a valuable problem-solving process
- Standardising on the “lowest common denominator” increases generality; solutions often need to be more specific
- Apparent wastefulness in expression is actually important redundancy
- Re-expression/re-representation → innovation

- So can we exploit (or subvert) the use of ontologies to promote this process?
Purposes of ontologies

• There seem to be various things that we might want ontologies to help with:
  – Consistent specification of products
  – Product data exchange
  – Assembly processes
  – Communication …
• These may not have the same implications for design and use of ontologies
• Useful overview by Catarina and Anne-Francoise suggests existing work not clearly driven by communication objectives
• Perhaps we need e.g. ways to capture argumentation/negotiation as part of a (local) “concept history”? 
Possible direction

• Examine role for methods of capturing “rationale”
  – e.g. perhaps IBIS (Conklin & Begeman) etc.
• Integrate with ontology to develop flexible system that tracks local convention and concept development
• Apply to construction sites and other specific contexts where communication and practice are crucial
• (At a higher level, might integrate with systems that map between ontologies …)