Models in collaborative design projects:

Boundary objects or make-believe?

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0. Topic

- Collaborative design work

- AEC industry:
  - Intensive, long-term collaboration
  - Multiple parties: divergent expertise, different interests
  - Premium on effective communication (failure costs)
0. Topic

- Modelling facilitates
  - Collaboration in design
  - Working on individual tasks

- For AEC:
  Architectural drawings →
  CAD software →
  Building Information Modelling (BIM)
“seamlessly bridge communication among different parties” (MARTINRILEY Architects)

Information layers, connected to relevant databases
‘Clash detection’
0. Topic and aim

- Prior work on modelling in collaborative design work (organization studies)
- Added value of philosophical analysis is not self-evident!

1. Review influential line of work ("boundary object")
2. Identify shortcomings
3. Explore alternative: Waltonian fictionalism
4. Identify joint shortcomings
PART 1. Models as boundary objects

http://www.atlasobscura.com
1. Boundary objects

Home discipline: STS

Some items enable effective problem-solving despite disciplinary/professional differences among ‘allies’

“[boundary objects] inhabit different social worlds and satisfy the information requirements of each of them” (Star and Griesemer 1989: 393)

E.g., repositories; standardized forms; flowcharts; sketches.
Natural history museum (Star and Griesemer 1989): specimens and standardized labels
“Allies”: amateur collectors; trappers; professional biologists; museum administration; …
1. BO-models: What’s not to like?

Applications to team design, new product development, ... (Henderson 1991; Carlile 2002; ...)

Focus on models as effective BOs

1. Flexible and focused: “taps individual expertise for socially distributed work”
2. Enable ‘perspective taking’
3. ‘Conscription devices’: focal points in work practice
4. Provide relative closure: settle conflicts, while leaving ‘wiggling space’
5. Establish control over task areas.
Flexible and focused
Perspective taking
Conscription of allies
Relative closure
Control
1. BO-models: what’s NOT to like!

1. How (or only that), not why of alignment → “epistemic object” (Nicolini et al. 2012)

2. Leaves dynamics unexplained → “epistemic object”, “technical object” (Ewenstein and Whyte 2009)

3. What is in different cognitive models, not how translation is achieved → “prototype” (Subrahmanian et al. 2003)


5. Too many ‘objects’ for effective analysis
How many objects do we need here?
Where are the virtuous ambiguities?
PART 2. Models as Make-Believe
2. Waltonian fictionalism

- Home discipline: aesthetics (Walton 1990)

- Representation: prop in authorized games of make-believe

- Prescriptions to imagine, for participants in game

- Conventional or explicit ‘principles of generation’ (PoG), fleshing out the fictional world / developing the game.

- Action/practice-oriented, not object-oriented.
2. Example

“Tree trunks are bears”

“The floor is lava!”
2. Fictionalism for models

- “Direct” version (Toon 2012): models are representations of real-world targets
- E.g., scale model of a bridge. Designed prop, generating fictional truths – can, but need not apply to real bridge (accuracy conditions).
- Constrain imagination of informed participants.
- PoGs: laws of nature, local regularities
2. MB-models: what’s to like?

1. No ‘virtuous ambiguity’, but clear role for constraints.
2. Room for divergent knowledge base, including tacit knowledge (shared and individual PoGs)
3. Room for development, without multiplying objects.
4. Accuracy / reliability conditions: scope for ‘correction’
5. Can be ineffective: ambiguous prescriptions; ‘poverty’ of representation; ‘rule bloat’
• Divergent PoGs
• Accuracy conditions
• Failure by ambiguity or ‘overload’: “rules management”

• Development and divergence within constraints
2. MB-models: what’s not (yet) to like?

- What is the point of the game? Walton: “understanding”; needs to be broadened
- Dynamics discussed cursorily: focus on product, little explicit attention for / analysis of process
- “Authorization” and “design” mostly brute facts
- “Ally” and “participant” are misnomers: AEC games of make-believe are partly antagonistic

- No reason to prefer BO-models: mostly shared shortcomings + room for improvement
3. Conclusions

• “Boundary object” does not allow sufficient understanding of modelling in collaborative design work (e.g., use of BIM in AEC)

• Further headway can be made through fictionalist analysis

• More attention needed for authorization mechanisms, potential antagonism, and process aspects
References