

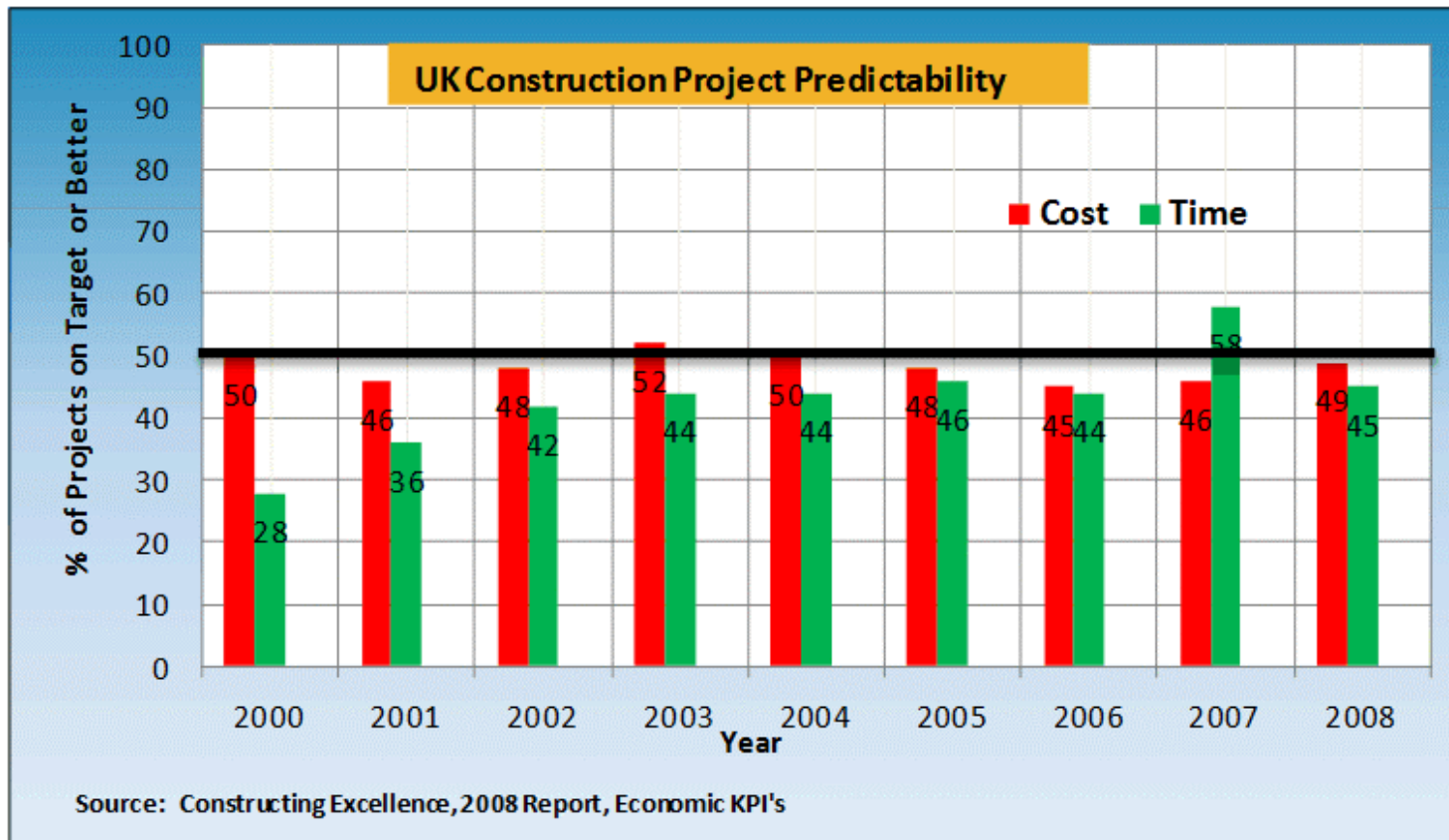


Introduction to BIM

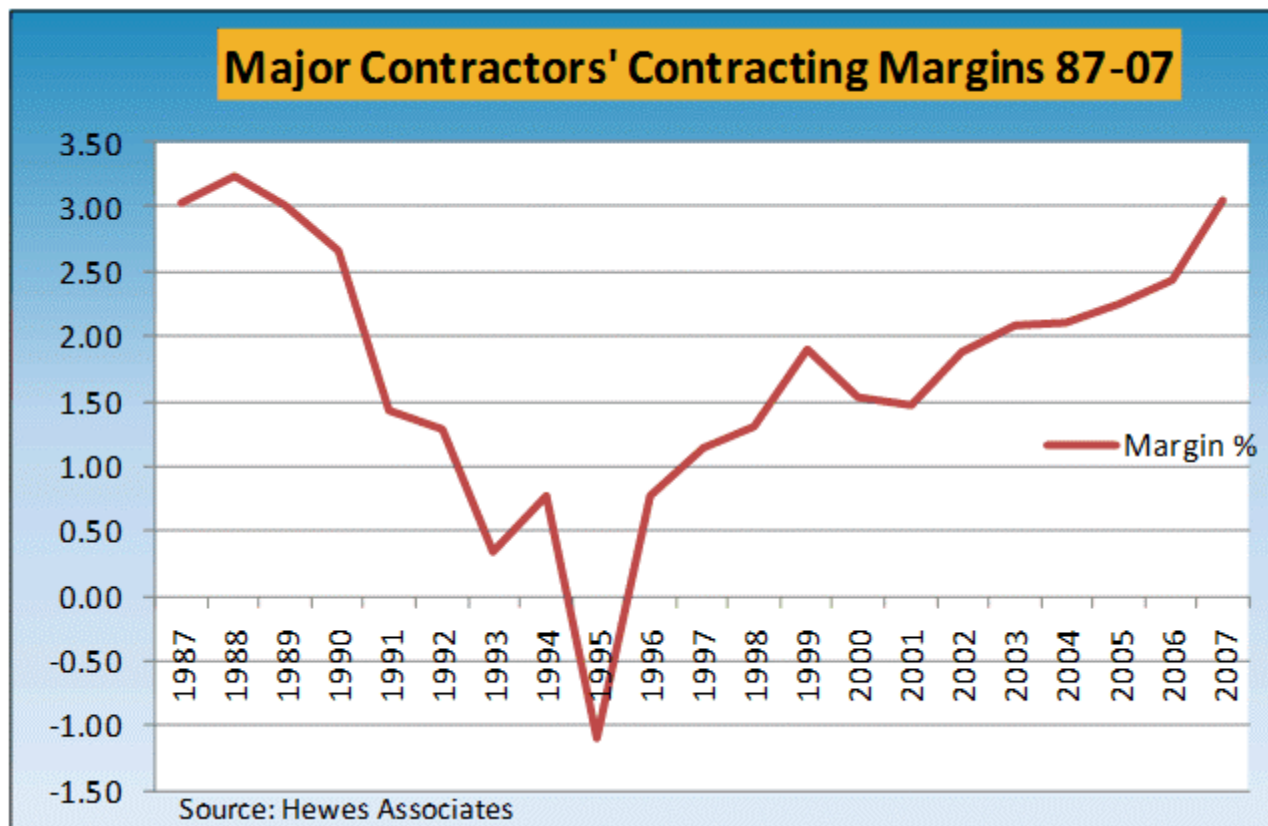
Transforming Construction?



Why Change?



Why Change?



Earlier Analyses

- Post-War – 20 Official Reviews / Reports
 - Murray & Langford
- All, particularly Higgin & Jessop, identify communications / information as a key problem

Earlier Analyses

- No solutions – lots of coping mechanisms:
 - Contract forms / Organisation structures
 - Culture / Attitudes (Latham / Egan)
 - “Confrontation causes project failure”, what if
 - Project failure causes confrontation.
- Fix the underlying problem – poor information

Conventional Design

- Most project information originates in the architectural drawings
- Drawings are pictures of imagined objects, using lines to represent edges of things or parts of things
- Every line is a discrete, individual piece of information, and must be managed as such.

Conventional Design

- Lots of discipline-specific symbols and notation
- Notation separate entities from the lines
- Every necessary view of an object requires a separate drawing (at least)

Conventional Design

- Huge problem, eased somewhat by CAD
- Still, this information is fundamentally untrustworthy. Recipient / user must check:
 - Correctness, Clarity
 - Consistency, Coordination
 - Completeness
- Hugely time-consuming, skill demanding and error-prone

Model Based Design

- Insertion of ‘intelligent’ objects in 3D space
- Each object corresponds directly with a component in the real building
- Objects behave rules; models are built according to rules – just like the real building
- Information contained in model can be passed to other users in a wide variety of rich forms:
 - Fly-throughs, videos, drawings, schedules etc.

Benefits for All

- Client
 - Photo-realistic walk-through model, explicit, non-cryptic. Easily understood.
 - Early, confident decisions; minimum client changes
 - Strong baseline for: scope, cost and programme
 - Greatly increased predictability

Benefits for All

- Individual Design Firm
 - Inherently consistent design, no internal contradictions.
 - Much more efficient internal design process
 - More high value work, less low value work
 - Greater job satisfaction, higher profit

Benefits for All

- Project Design Team
 - Shared reference model
 - Streamlined (Automatic?) design coordination
 - Many fewer design review and integration cycles
 - Much more efficient overall team performance
 - Reduced need for contractor design
 - Higher value work, increased margins

Benefits for All

- Contractors
 - Dramatically better visualisation and construction simulation
 - Precise scope definition:
 - Improved, fairer, more competitive procurement – more profitable projects
 - Improved cost and schedule targets and progress assessment – more predictable projects

Benefits for All

- Building Owner / Operator
 - Definitive as built model generated as a by product of construction management
 - Ideal basis for facilities management and equipment maintenance programmes
 - Powerful asset management tool:
 - Optimise functionality and performance of the building
 - Maximise return on investment

The Bigger Picture

- Trustworthy information: End-to-End Data
- Other Industries; Supply Chains
- EPOS
- Ikea
- Digital Construction

The Bigger Picture

- Build Off-Site
 - Design for Manufacture & Assembly
 - Construction as a Manufacturing Industry
 - The End of Craftsmanship
- Who will win?
 - Laing O'Rourke? Balfour Beatty?
 - Designers? Manufacturers?
- BuildingSMART

What is going on in the world of BIM ?

- BuildingSMART are behind the promotion of open BIM
- MBEKTN process efficiency group say it is vital
- UK Contractors' Group and Constructing Excellence both have an IT group
- RIBA knowledge community
- Build London Live -see <http://www.buildlondonlive.com/>
- Universities of Salford, Reading, Loughborough and others all involved in education and research
- British Standards producing guidance
- EU research