



Innovation in megaprojects

Andrew Davies*

PhD Course
Part 1: Innovation in Projects
BI Norwegian Business School
4-6 September 2017

*Professor Management of Projects, The Bartlett Faculty of the Built Environment
School of Construction and Project Management

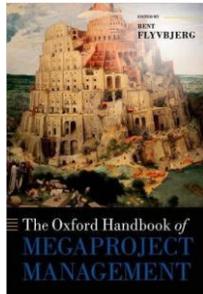


- Megaprojects
- Megaprojects: complex and uncertain
- Group work: innovation in megaprojects



Megaprojects

- Strategic high-risk infrastructure projects \$1bn or more (US dollars 2003)
- Prefix "mega" (million) caught on when projects were evolving into giga (billion) projects
- Spending on megaprojects is \$6 to \$9 trillion annually
- Investment in infrastructure \$57 trillion 2012-2030 (McKinsey 2013)
- Bent Flyvbjerg believes this is "the biggest investment boom in human history"



UCL

Examples of megaprojects

- High-speed railway
- National Healthcare IT system
- Wide-body aircraft Airbus A380
- Defence and weapons systems
- Constructing and staging Olympic Games
- Opera House
- Megadam
- International airport
- etc.



UCL

Large, complex and high-risk endeavours

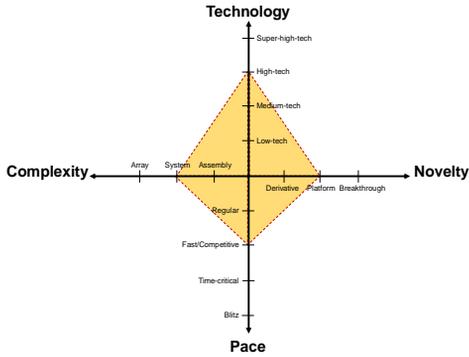
- Led by large sponsors, clients and parent organizations
 - Large network of clients, dozens of contractors, thousands of sub-contractors
 - Global projects (e.g. Panama Canal)
 - Multiple stakeholders often in urban areas
- Long project life cycle
 - Uncertain future outcomes
 - From extended "front-end" planning to project delivery



UCL

Megaprojects usually fail

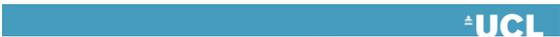
- 90% are over budget (Flyvbjerg 2014), most are late and fail to achieve their targets
- 'Productivity paradox' (Flyvbjerg et al 2003)
- 1960-216 the average cost overrun for hosting the Olympic Games (construction and staging the event) was \$26 billion
 - Average of 156% (four times the original estimate)
 - The highest of any megaproject
 - If no cities wish to host the games (e.g. Rome, Boston and Hamburg pulled off the bid for the 2024 Games) the model is unsustainable



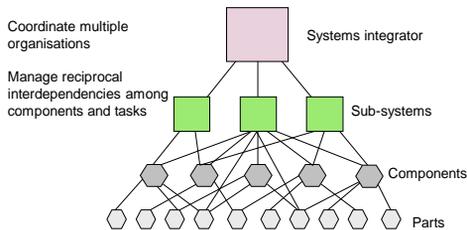


Complexity requires systems integration

- Organisational innovation in US weapons systems projects 1950s and 1960s (Morris 1994)
- 'nurture the in-house capability...to know more about the total effort than any of the contracting parties' (Sayles & Chandler 1971)
 - Understand whole system, components and interfaces
 - Coordinate design, construction, integration, testing, commissioning and handover of components
 - Formal contracts, shared goals, and persuasion to achieve close cooperation among parties
 - Process to control how changes in one component impact on others

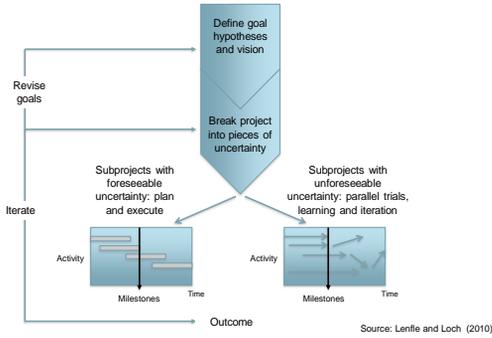


System projects



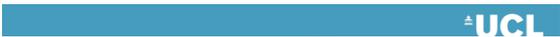


Targeted flexibility for pieces of uncertainty





- Megaprojects
- Megaprojects: complex and uncertain
- Group work: innovation in megaprojects



Group work: innovation in megaprojects

- Each group examines the three cases: Heathrow Terminal 5, London Olympics and Crossrail
- Each group answers the following questions:
 1. Describe the main characteristics of each megaproject (e.g. systems integrator, organisation, etc)
 2. What are the main innovation challenges?
 3. What are the main similarities and differences across the projects?



	Heathrow Terminal 5	London Olympics	Crossrail
1. What are the main characteristics of the megaproject?			
2. What are the main innovation challenges?			
