A Global Perspective of Australian Major Projects
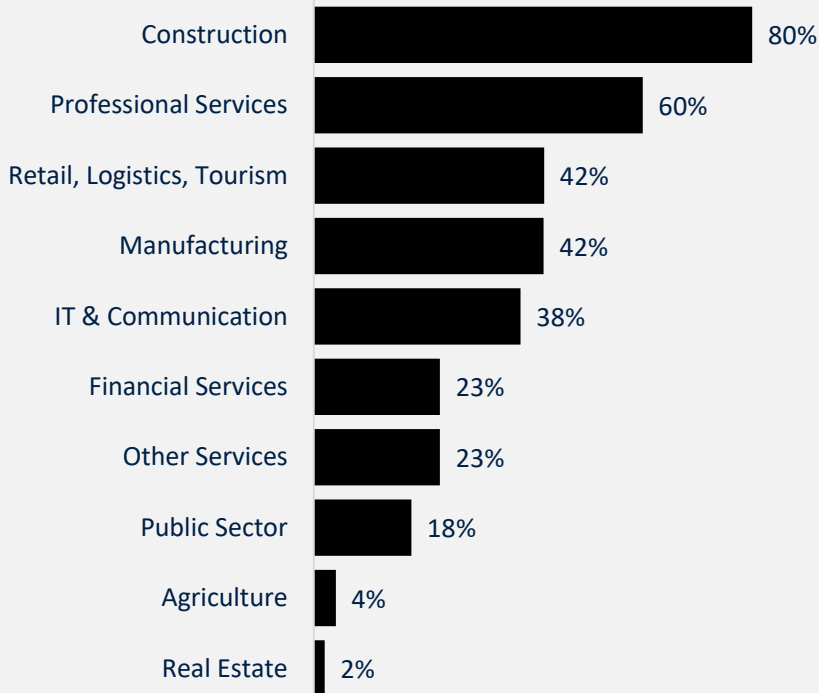
Dr Alexander Budzier, Fellow of Management Practice, Saïd Business School, University of Oxford
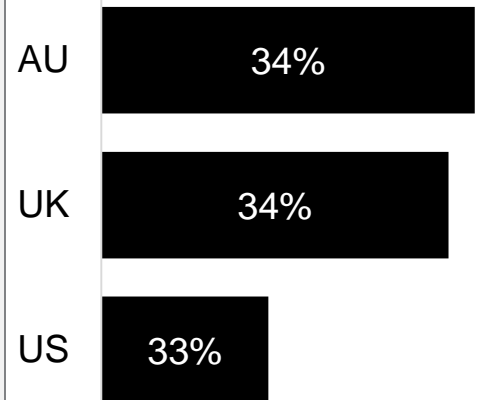
Agenda

- **The Oxford research**
- Observations on Australian major projects
- Global trends in major projects
- Projects need disruption

One Third of the AU's Economic Activity Takes Place in Projects

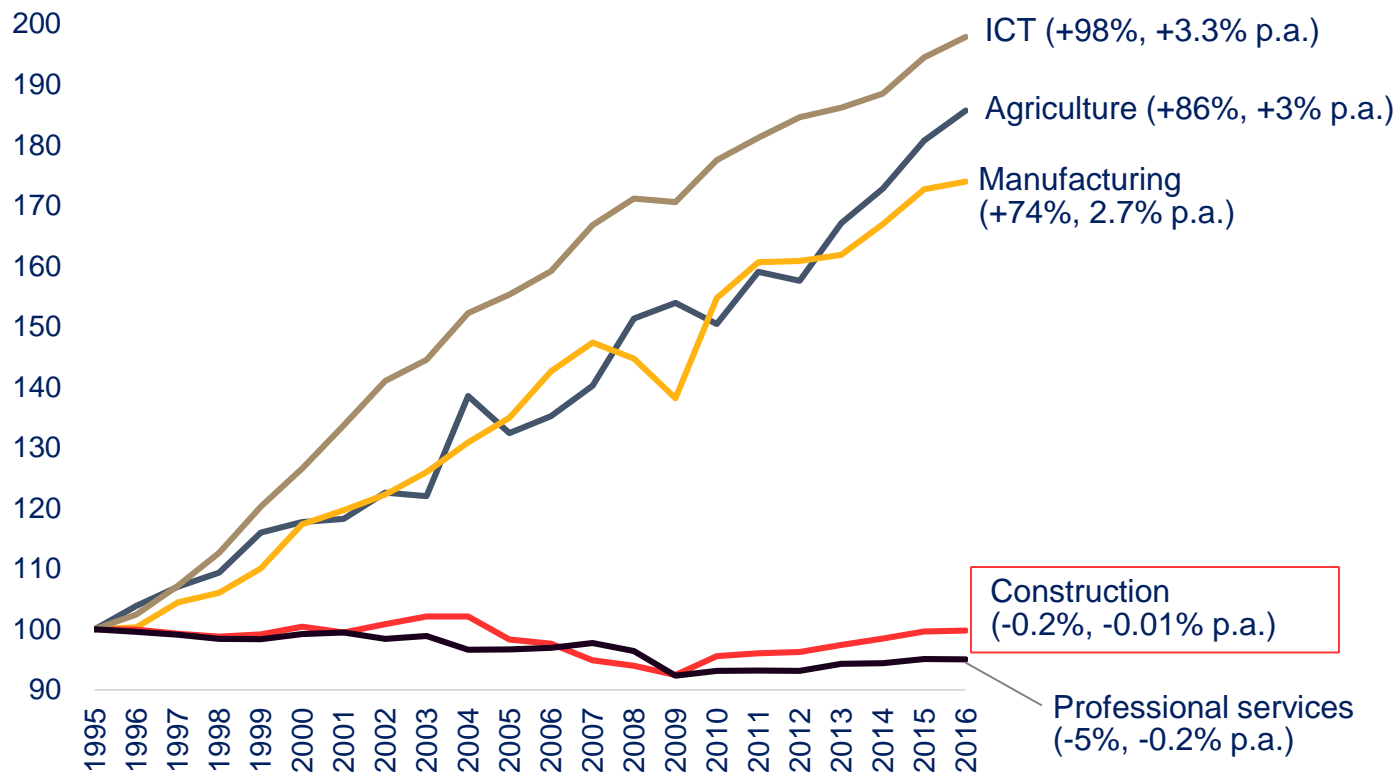## Time worked on projects as % of total time worked p.a.

Sector	%
Construction	80%
Professional Services	60%
Retail, Logistics, Tourism	42%
Manufacturing	42%
IT & Communication	38%
Financial Services	23%
Other Services	23%
Public Sector	18%
Agriculture	4%
Real Estate	2%

Share in total no. of hours worked p.a.

Region	%
AU	34%
UK	34%
US	33%

Productivity 1995-Today
(GDP created by 1 hour of work in each industry baselined to 1995 = 100)

ICT (+98%, +3.3% p.a.)

Agriculture (+86%, +3% p.a.)

Manufacturing (+74%, 2.7% p.a.)

Construction (-0.2%, -0.01% p.a.)

Professional services (-5%, -0.2% p.a.)

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The Iron Law of Projects

"Over budget, over time, under benefits, over and over again." (Bent Flyvbjerg)

- 100.0% — All infrastructure and construction projects (n=3,022)
- 27.3% — On-budget (or better)
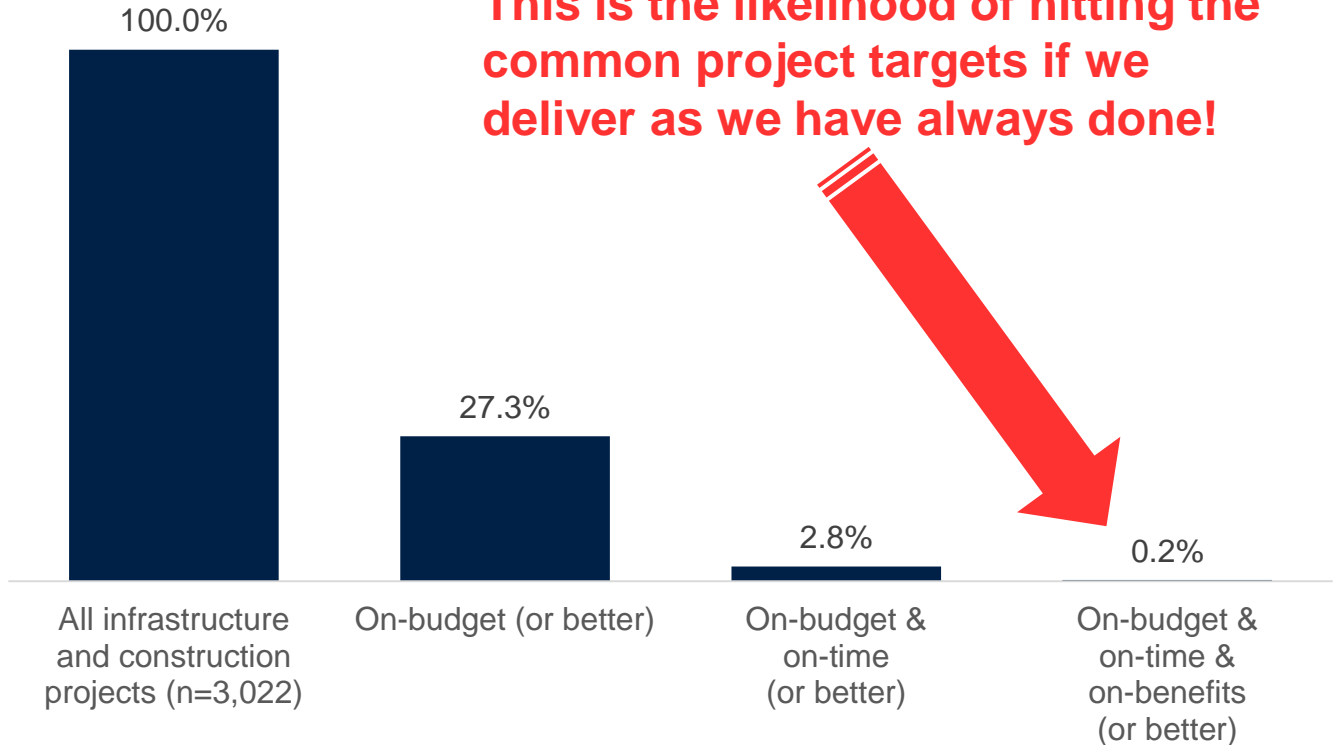- 2.8% — On-budget & on-time (or better)
- 0.2% — On-budget & on-time & on-benefits (or better)
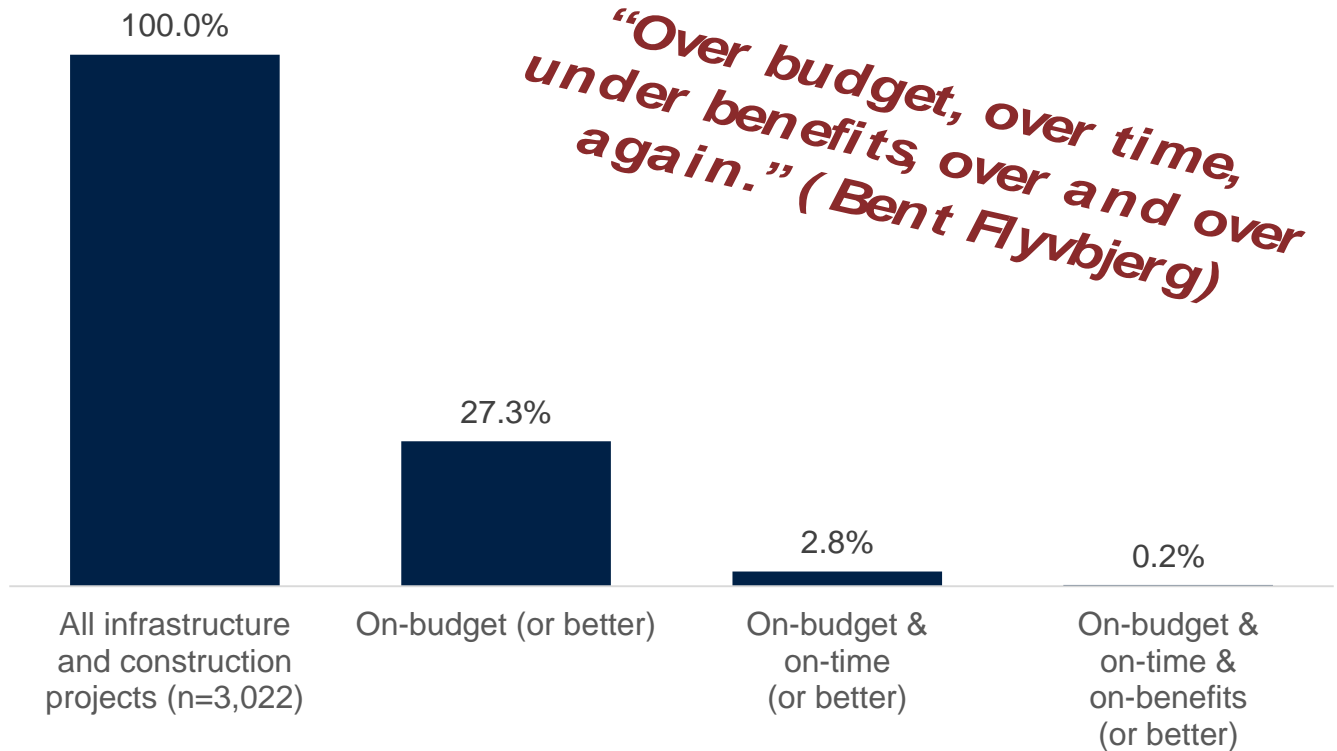
The Iron Law of Projects

This is the likelihood of hitting the common project targets if we deliver as we have always done!

100.0% — All infrastructure and construction projects (n=3,022)

27.3% — On-budget (or better)

2.8% — On-budget & on-time (or better)

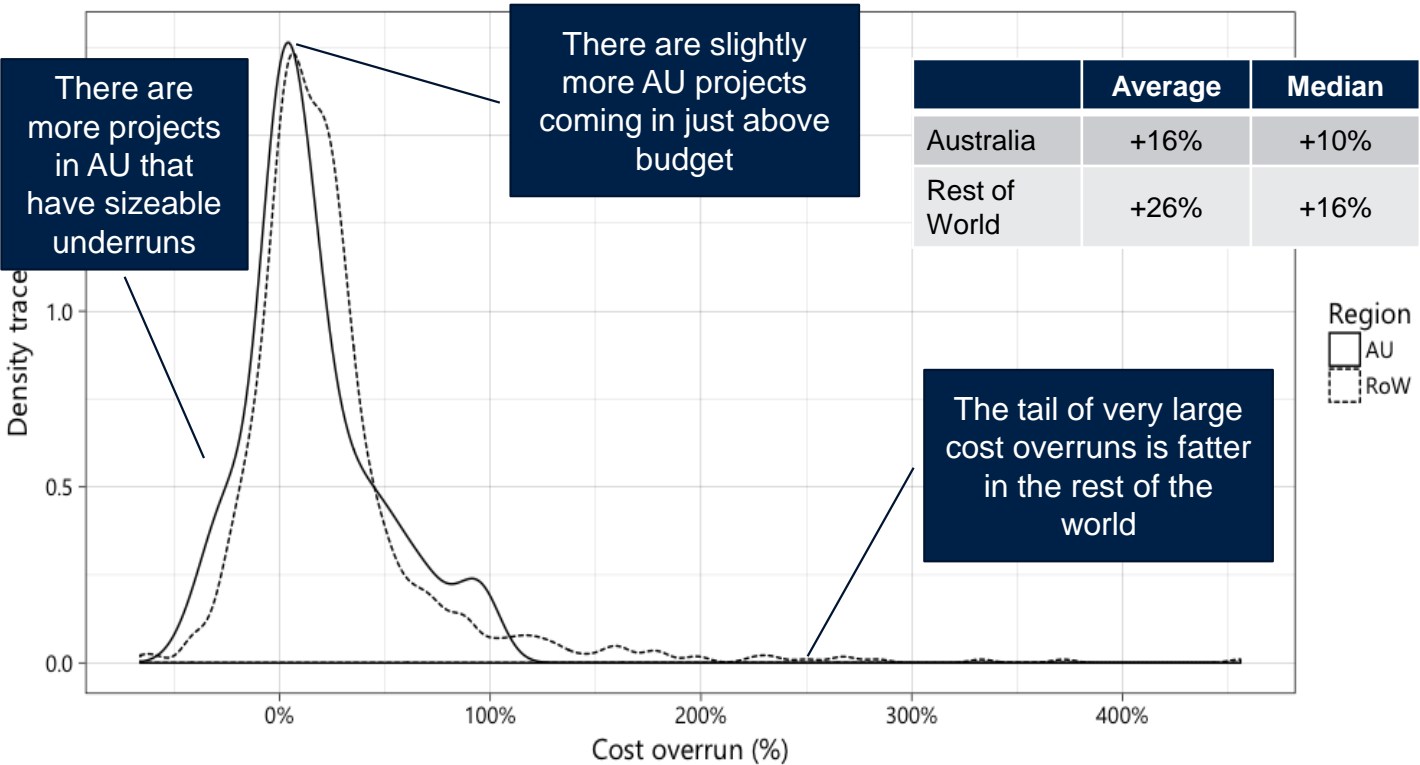0.2% — On-budget & on-time & on-benefits (or better)

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International Comparison

	Average	Median
Australia	+16%	+10%
Rest of World	+26%	+16%

Region
☐ AU
┆ RoW

International Comparison

There are slightly more AU projects coming in just above budget

There are more projects in AU that have sizeable underruns

	Average	Median
Australia	+16%	+10%
Rest of World	+26%	+16%

The tail of very large cost overruns is fatter in the rest of the world

Region
AU
RoW

Density trace

1.0

0.5

0.0

0% 100% 200% 300% 400%
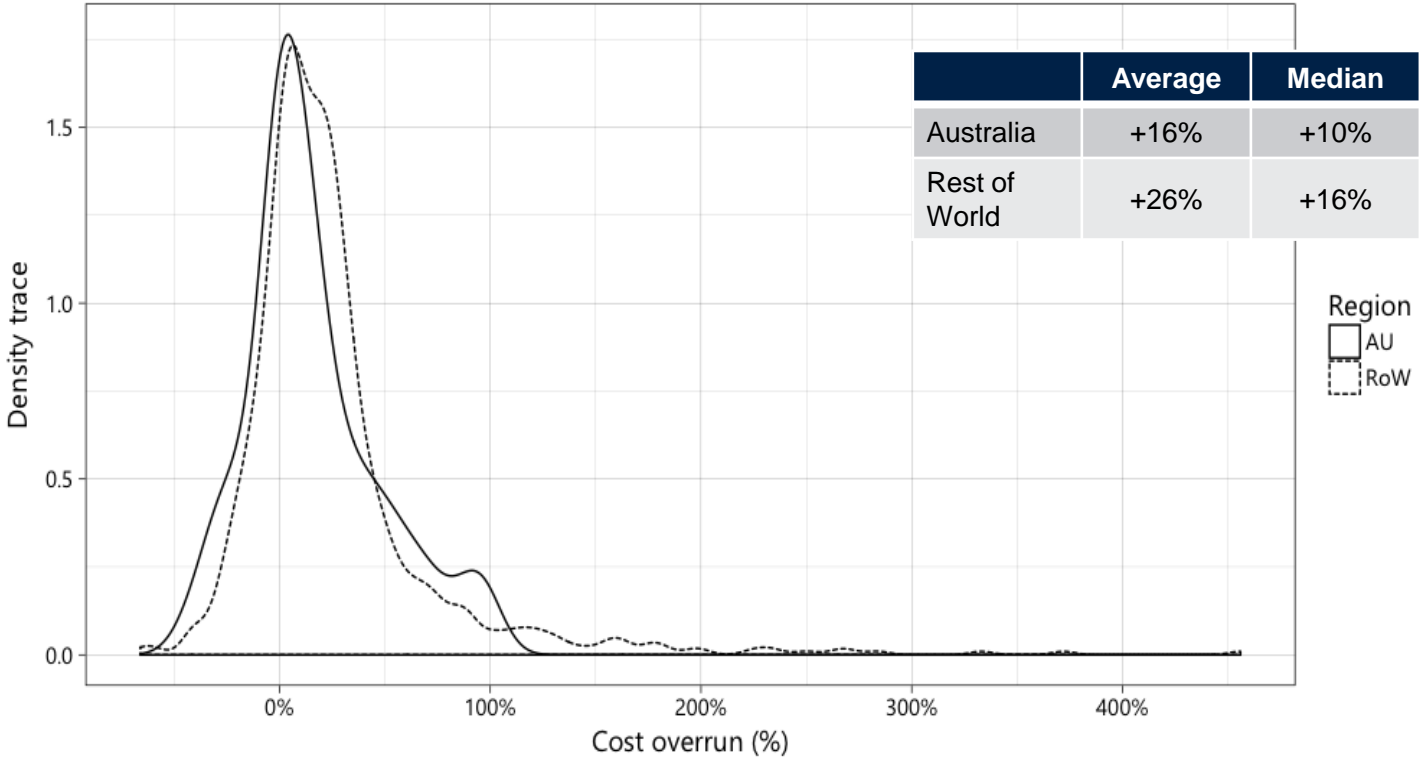
Cost overrun (%)

We Need to Do Projects Differently

1 in 3 hours worked in the Australian economy are spent working in projects.

Productivity in the two project-heaviest sectors (construction, professional services) has not improved in the last 20 years.

The odds of delivering as promised, i.e. on-budget, on-time, on-benefits (or better) are slim, i.e 0.5%.

Agenda

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- Observations on Australian major projects

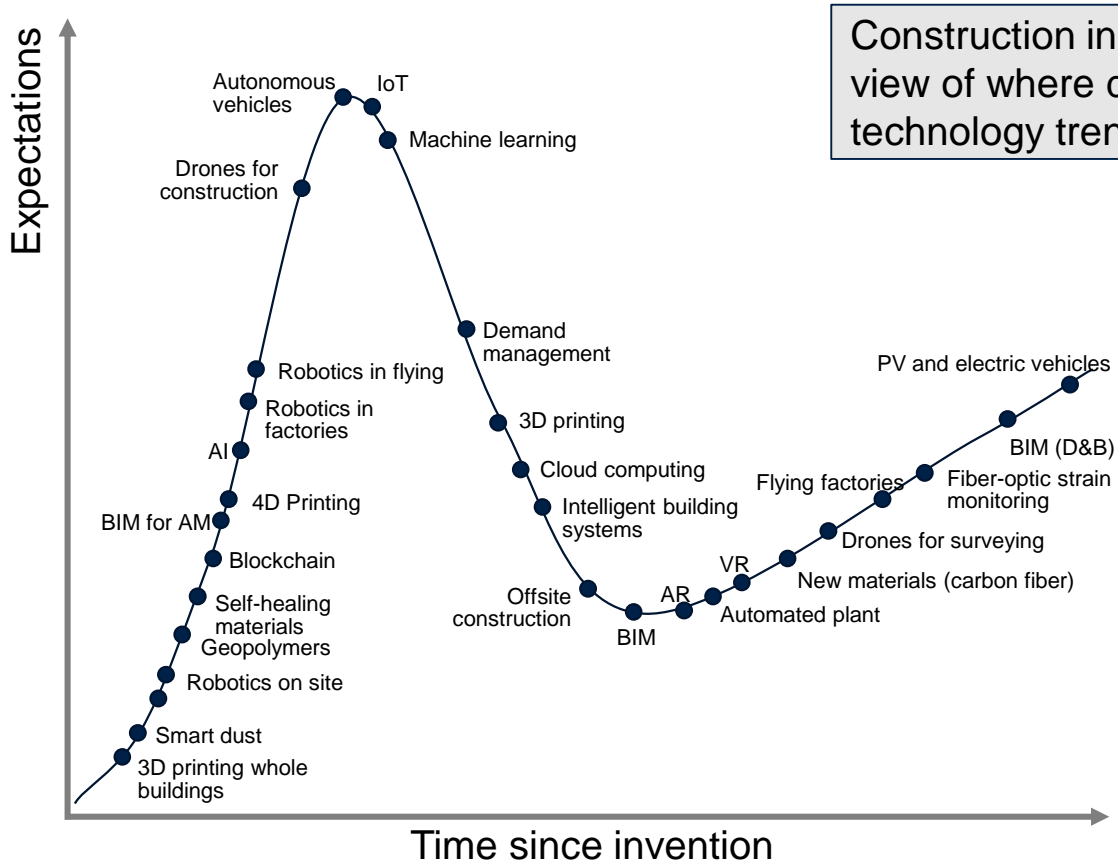- **Global trends in major projects**

- Projects need disruption

Scenario 3: Green Reboot

Agenda

- The Oxford research

- Observations on Australian major projects

- Global trends in major projects

- **Projects need disruption**

Construction industry view of where different technology trends are.

Expectations

Autonomous vehicles
IoT
Machine learning
Drones for construction
Demand management
PV and electric vehicles
Robotics in flying
3D printing
BIM (D&B)
Robotics in factories
Cloud computing
Flying factories
Fiber-optic strain monitoring
AI
Intelligent building systems
Drones for surveying
4D Printing
VR
New materials (carbon fiber)
BIM for AM
AR
Blockchain
Offsite construction
Automated plant
Self-healing materials
BIM
Geopolymers
Robotics on site
Smart dust
3D printing whole buildings

Time since invention
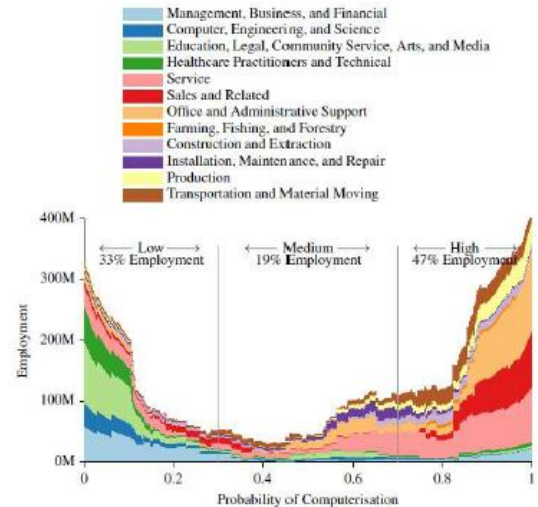
Construction Needs Disruption!
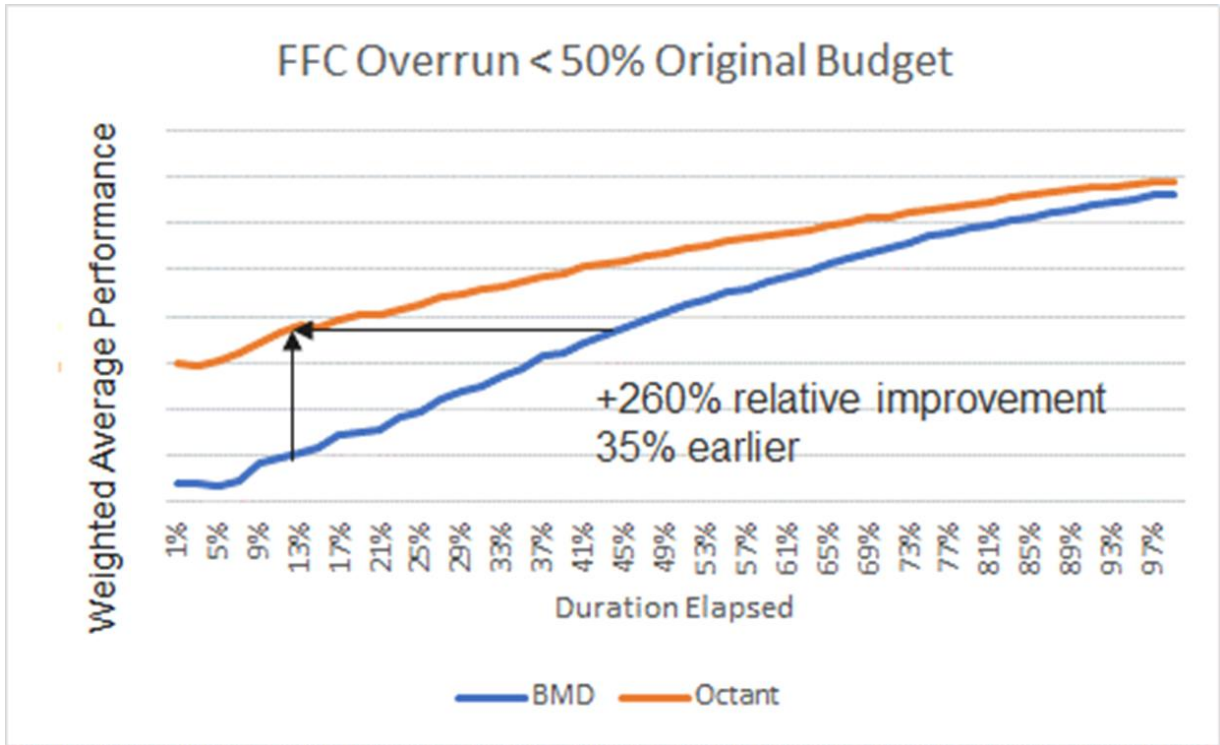
Who Will Disrupt Construction?

Projects will be Disrupted by Machine Learning / Artificial Intelligence

- Data and computing power are increasingly available
- Technical advances to use data that was previously not accessible or too complex to handle by human analysts
- Disruption by Machine Learning more likely in knowledge work and managerial work than in physical work
- Transactional or repetitive work most likely to be automated
- Potential of ML to overcome the "Iron Law of Projects" by supporting better and faster decision making across the whole life cycle of projects
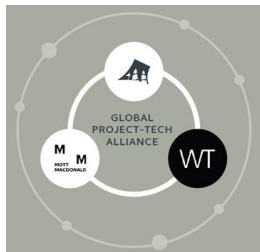
C. Frey, M. Osborne / Technological Forecasting & Social Change 114 (2017) 254–280

Management, Business, and Financial
Computer, Engineering, and Science
Education, Legal, Community Service, Arts, and Media
Healthcare Practitioners and Technical
Service
Sales and Related
Office and Administrative Support
Farming, Fishing, and Forestry
Construction and Extraction
Installation, Maintenance, and Repair
Production
Transportation and Material Moving

Changing the paradigm

Global Project-tech Alliance

Expert Collective Alliance

- **Oxford Global Projects** – leader in major project cost/time strategy.
- **Endeavour Programme** – Leader in artificial intelligence platform Octant AI
- **Deep Reason** – Leader in artificial intelligence research and innovation