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The Role of Risk Management in Success / Failure of Megaprojects

Presented by:

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Technical Director – Risk

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About the Speaker

Santhosh Therakam

Technical Director – Risk

Asia Pacific & Middle East

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35 Years of Global Experience – Australia, NZ, HK, Middle East, India

MTech (Civil Engineer), FIEAust, CPEng, RPEQ; Certified Practising Project Director; Finishing CPA (2019)

Worked as a Contractor, Consultant and Client

Project Highlights

+ Ipswich Motorway D2G
+ Sydney Metro; Cross River Rail & ETCS; Inland Rail - ARTC
+ BHP Olympic Dam; Rio Tinto Coal Australia
+ AWHC Auckland Second Harbour Crossing – NZ
+ Black Point Power Plant – HK
+ LAND400; LAND121; Tindal – Australian Defence
+ Abbot Point T0 Coal Terminal
+ Oil & Gas: Qatar, Oman, KSA

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Defining the problem

Defining the problem

+ With the increase in size, most **multi-discipline projects are becoming more complex** and “failure rate” of projects is going through the roof.

+ The traditional industry **practices are inadequate** and unsuitable for a complex and irrational environment.

+ **Long-term value is inadvertently sacrificed** in the pursuit of short-term cost savings. The result is repeated instances of projects failing to deliver their intended outcomes.

+ Risk Leadership needs a thorough revamp and **radical changes** to enhance the probability of success rate.

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Defining Complexity

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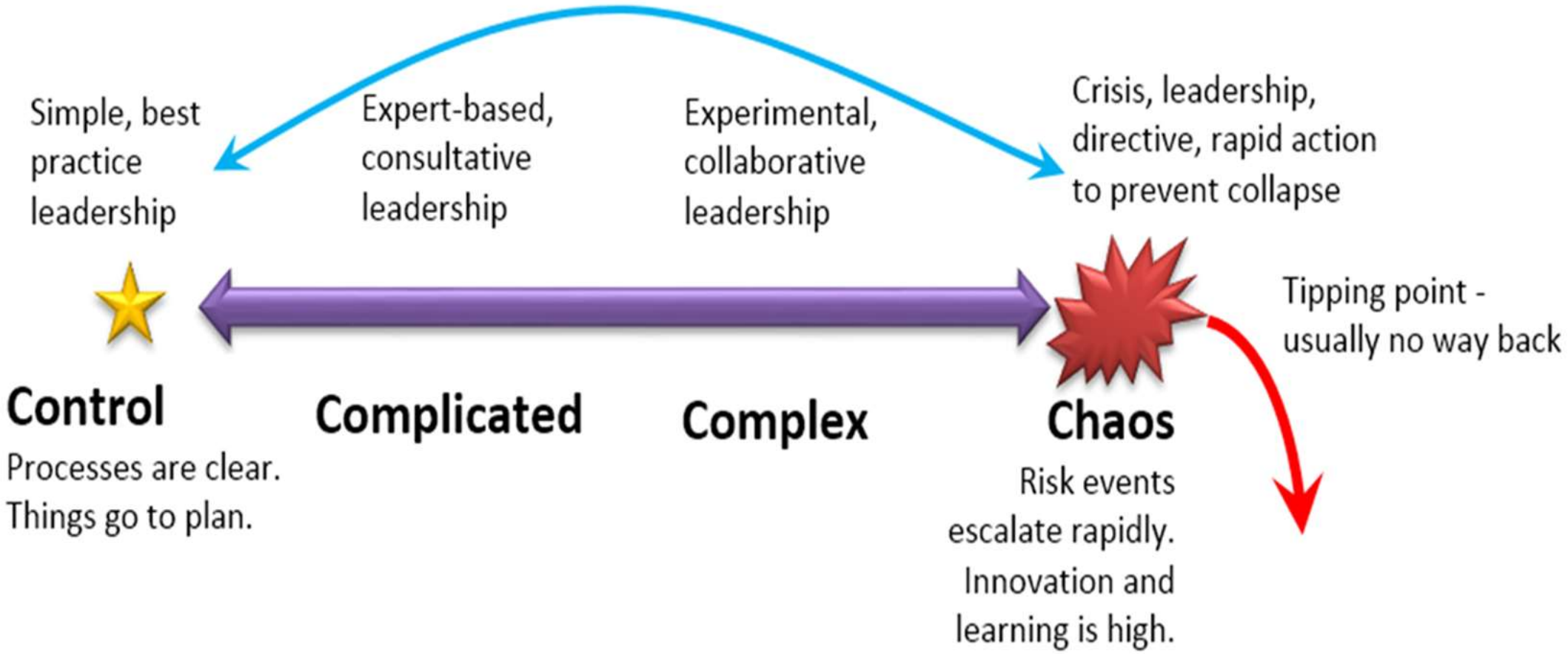

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Complicated v. Complex

Complicated

Complex

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Complicated v. Complex

Characteristics	Complicated	Complex
Causality	**Linear** cause-and-effect	**No clearly distinguishable** cause-and-effect pathways
Linearity	Output has a **proportionate** input	Outputs are **not proportional** or linearly related to inputs
Decomposability	Can be **broken down** into structural parts; **piecemeal**	**Never fully understand** these inter-relationships
Controllability	Problems **can be diagnosed** and permanently solved	**Rarely able to distinguish the real problem**.
Freedom	**Limited or constrained** interactions	Complex systems are **nested** such that they are part of larger scale complex systems
Foreseeability	**Fully known** or can be modelled	**Not dependent on the amount of available data or knowledge**
Adaptability	Need an **external force to** introduce change.	Able to observe themselves, learn and adapt. **Innovation is the key driver.**

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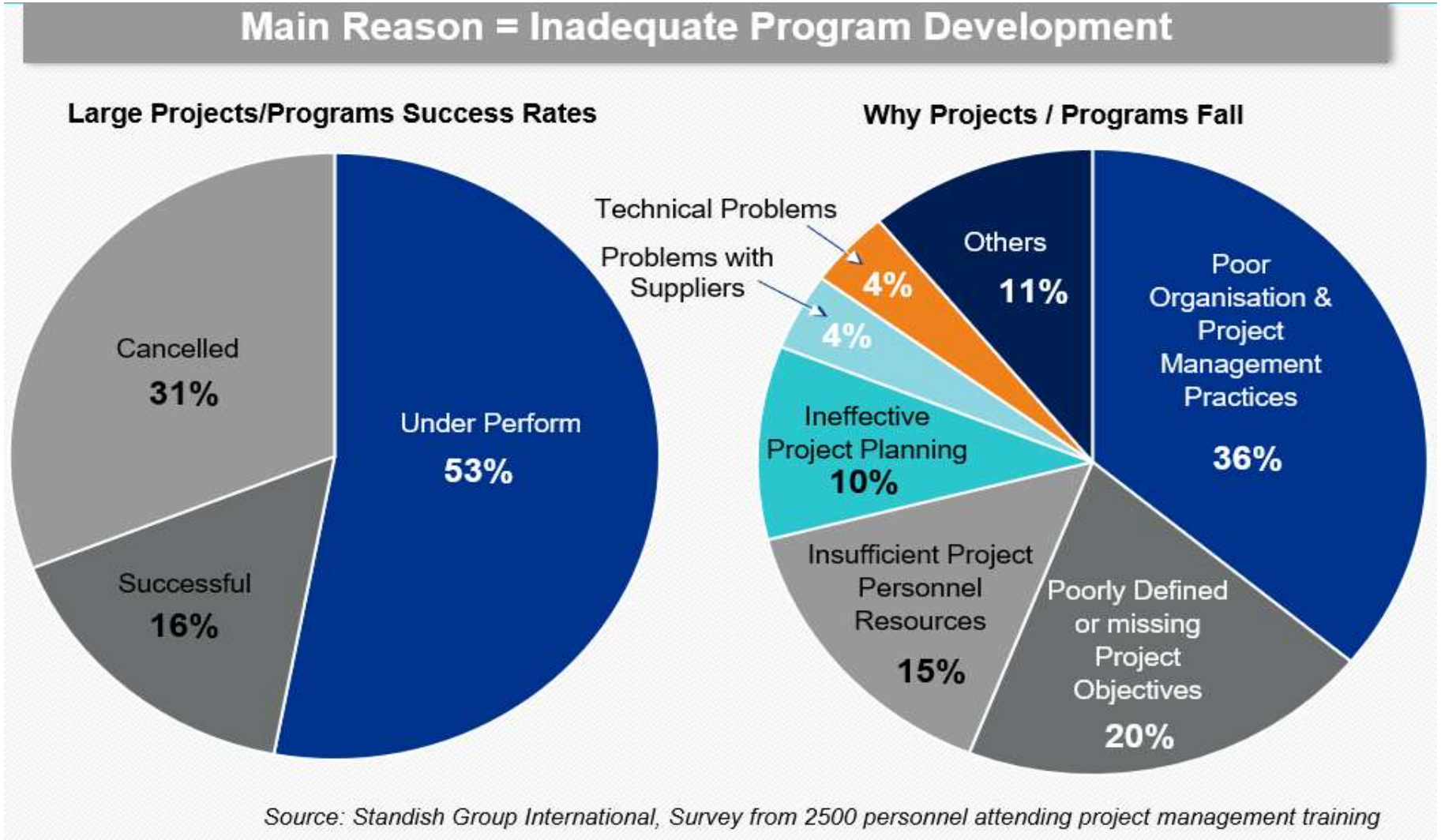
Why do projects fail?

Let’s explore….

Why Projects / Programs Fail?



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Key Drivers in Project Failure

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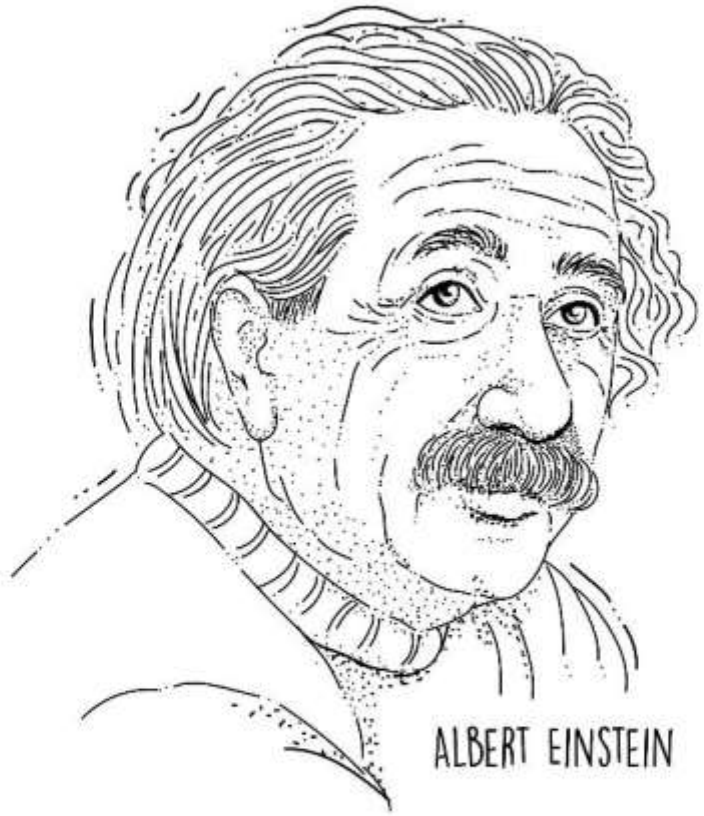
1. Insanity



Insanity: doing the same thing over and over again and expecting different results.

- ALBERT EINSTEIN

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2. Who defines Value?

Denver, Colorado's biggest city won the bid to host the 1976 Winter Games, but its **citizens decided they had other priorities.**

Denver rejected the Olympics in favour of the environment and economics.

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2. Who defines Value? (Contd..)

Alaskan Way Viaduct replacement tunnel (aka Bertha Seattle Tunnel)

+ 2.7km long
+ 17.5m dia World's largest

$2.8B Budget;
$4B Actual – 45%

2 years delay

Makes traffic even worse

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3. Optimism Bias

+ **Under-estimation**
  - Scope
  - Cost
  - Time

+ **Over-estimation**
  - Benefits
  - NPV/IRR

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3. Optimism Bias (Contd..)

+ Road Projects:	20% ⬆ cost overrun	9 out of 10
+ Bridges and Tunnels:	35% ⬆ cost overrun	
+ Rail Projects:		
▪ Underestimation of budget:	45% ⬇	
▪ Overestimation of demand:	51% ⬆	
+ Olympics: Average cost overrun:	179% ⬆	10 out of 10

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3. Optimism Bias (Contd..)

Cost Blowout: 1,400%

Budget: $7 million; Actual: >$100 million

14 Years to construct – 10 Years Late

Most expensive cost blowout in the history of megaprojects around the world

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3. Optimism Bias (Contd..)

The longest tunnel in Australia - Airport Link in Brisbane.

Business Case: **$2.3B;**

Final Cost: **$4.8B;** **109%** ⬆ Cost Blowout

+ **Underestimation of costs**

Forecasted Traffic 170,000 vehicles a day

Actual <50,000 vehicles a day (**70%** ⬇ **than the forecast**)

+ **Over estimation of benefits**

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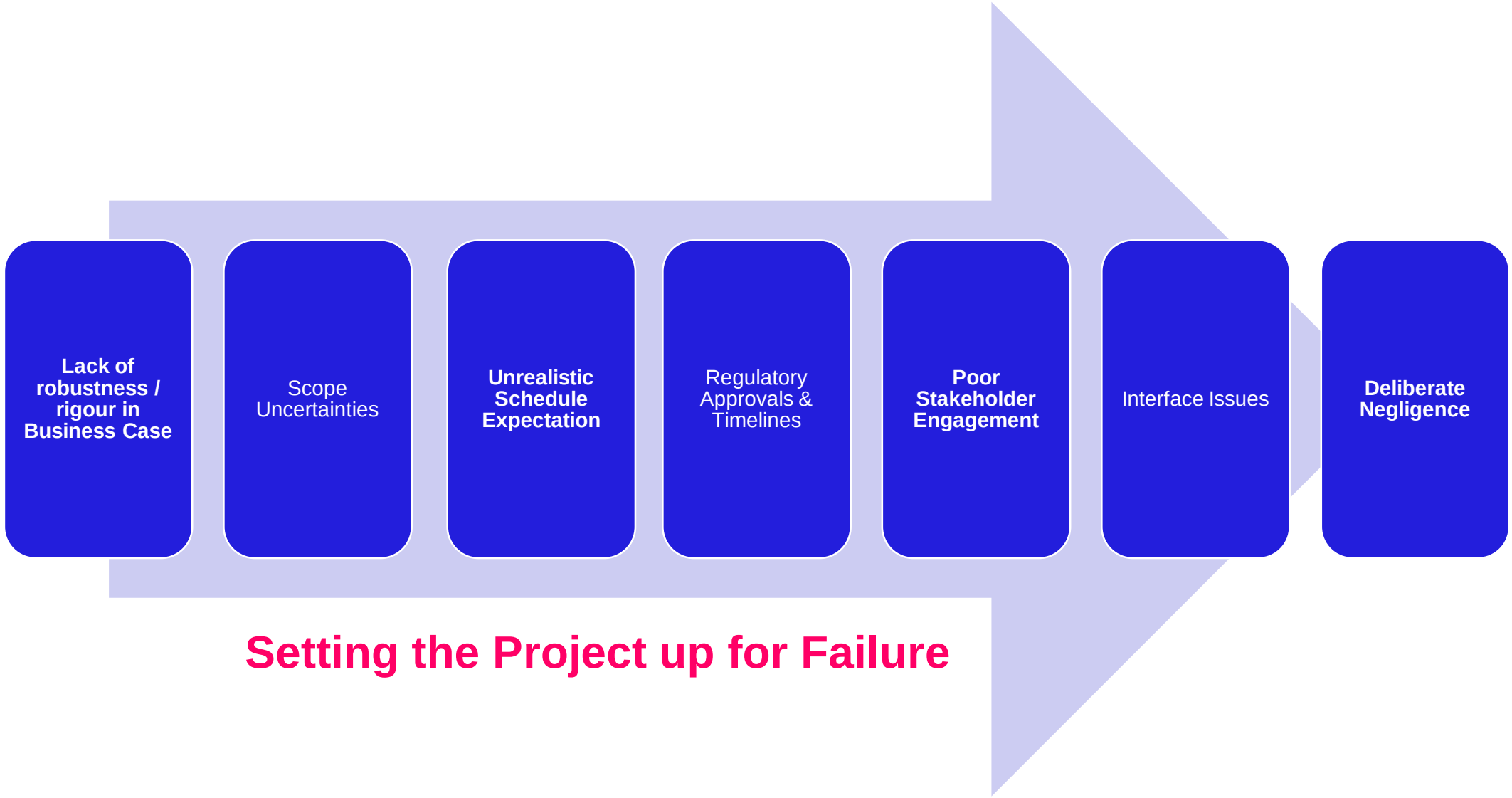
4. Lack of rigour in Development Phase



Setting the Project up for Failure

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4. Lack of rigour (Contd..)

Sydney Metro (CBD to Randwick and Kingsford), 2019
Original $1.6B; Cost to date: $3B (**100%** ⬆ **cost Overrun**)
Currently **running late by 1 Year**

PPP Acciona / ALTRAC slammed a claim for $1.1 B alleging

Government has misled over the project's complexity -
"misleading or deceptive conduct" over the cost of replacing powerlines in the CBD"

Result: $576M in settlement

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5. Transfer of Owner's Risks to other Parties

"The client may, therefore, **pay for risk twice** –

+ once to pay the supply chain for holding or managing the risk, and
+ then to bear the actual costs of the risk when its transfer ultimately proves impossible."

Infrastructure and Projects Authority Major capital programmes: a discussion document based on insights from recent experience, 2016.

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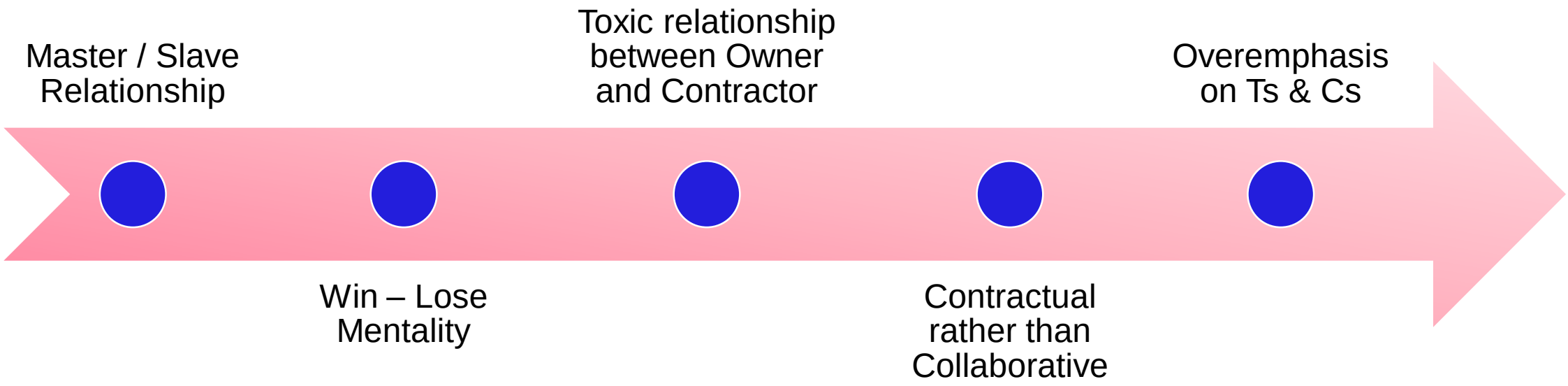
6. Win-Lose Mentality / Misalignment



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7. Transactional Leadership

- Contractual
- How to recover losses and enhance profits?
- Reactive / Lag indicators
- Win – Lose Mentality

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8. Lack of Innovation / Low Productivity

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8. Lack of Innovation / Low Productivity

“**Construction productivity** has been **flat** for decades, according to McKinsey research.

In manufacturing by contrast productivity has nearly **doubled** over the same period and **continuous improvement** has been the norm.”

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9. Poor Execution: B-Team

A-Team not available for deployment - Fire fighting elsewhere due to project delays!

No alternative high-calibre replacement available

Resumes are great on paper

Lack of Skills and Experience on high-stress / high-value projects

Lack of Internal Controls

Lack of mentoring / Upskilling / Lessons Learnt

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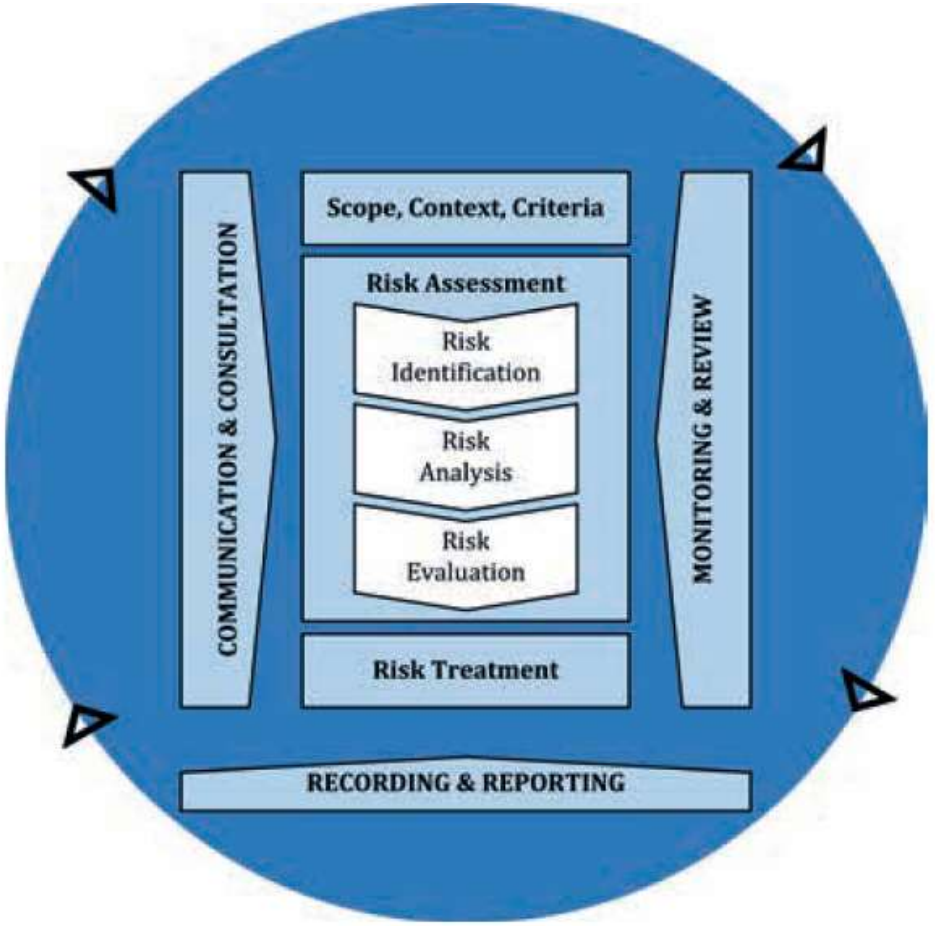
How to enhance the chances of Project Success?

ISO31000:2018 Risk Management - Guidelines

Framework



Process

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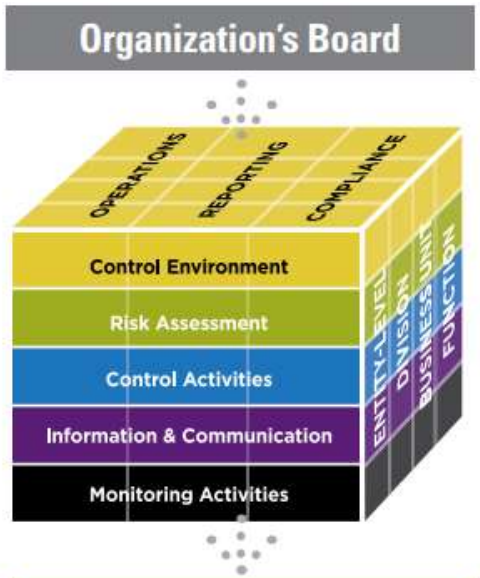
Internal Control — Integrated Framework (2013)

Committee of Sponsoring Organizations of the Treadway Commission



Sets Organization's Objectives

Framework used to manage risk and control to accomplish objectives

1st Line of Defense		2nd Line of Defense	3rd Line of Defense
Management Controls	Internal Control Measures	Financial Control Security Risk Management Quality Inspection Compliance	Internal Audit

Organizational structure to execute risk and control duties

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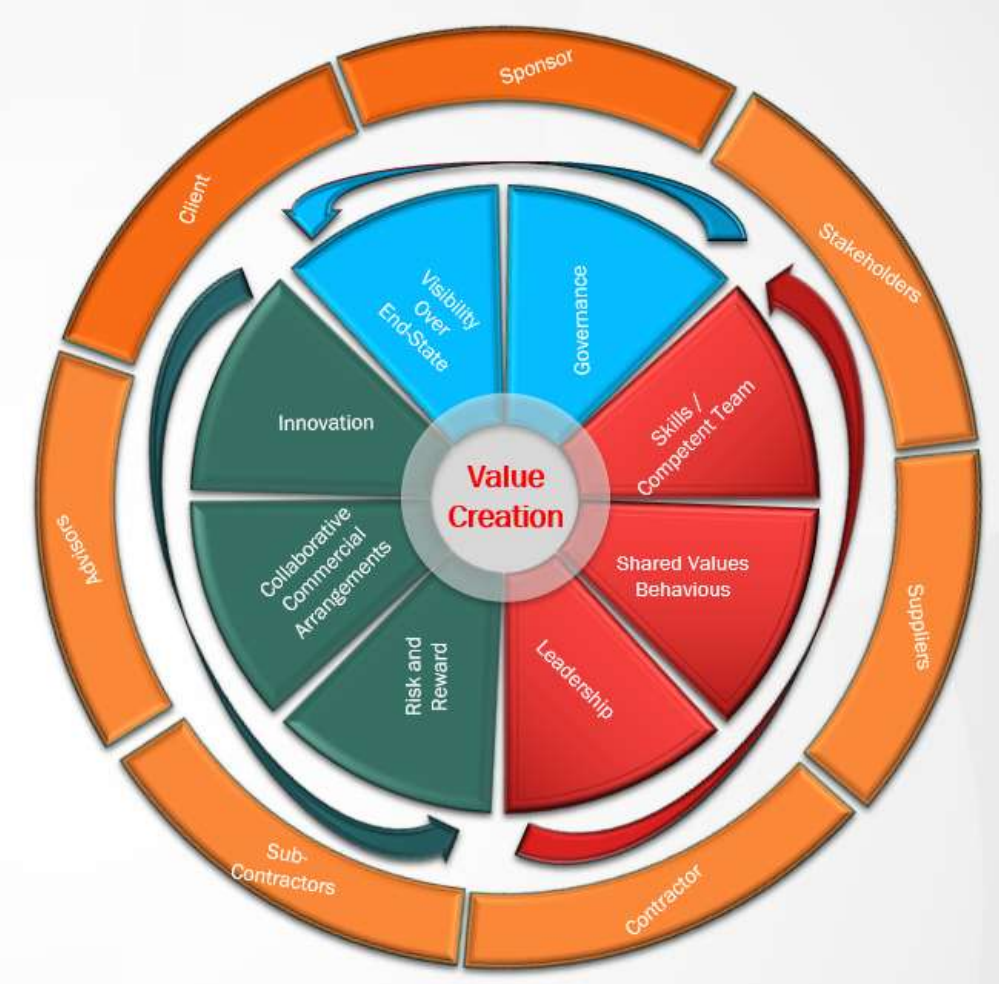
Wheel of Value Creation



- Governance & Alignment
- Collaborative Environment
- Leadership & Shared Values

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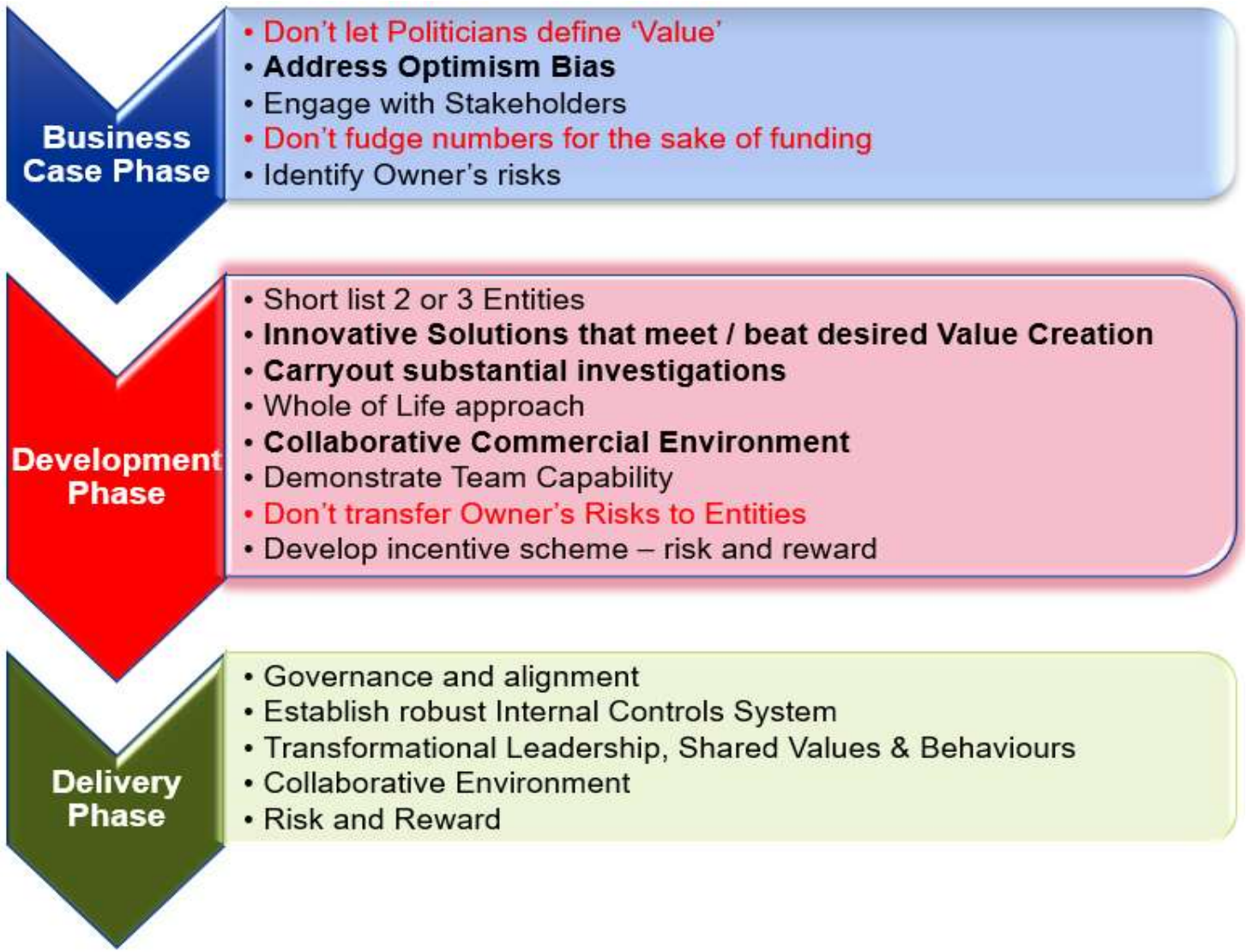
Business As *un*Usual



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How to create Value and enhance a Project Success?

LEGEND
Sponsor | Owner | Advisors | Entities
Owner, Advisors, Entity

1 Define Value
Define Objectives

Develop
- Scope / SWTC / Specs
- Concept Designs
- Carryout Limited Investigations
- High level Risk Assessment
- Cost Estimate
- Programme (Schedule)
- Benefits Assessment
- BCR / IRR
- VfM

Budget Allocated
Yes
Approved?
No
Yes
VfM? BCR / IRR?
No
Business Case Report

Initiate the process for regulatory approvals, land resumptions, engage with key stakeholders, incorporate their requirements in design, cost and schedule to reflect the impacts

Identify Owner's risks
- Latent conditions
- Unknown ground conditions, PUPs relocation
- Escalation, Changes to Legislation WHS requirements, Regulations, Standards
- Seasonal Wet Weather etc.

- Don't let 'politicians' define what 'Value' is.
- Don't fudge the numbers to obtain funding

- Avoid Optimism Bias resulting in underestimation of costs and overestimation of benefits

Business Case Phase

Short list 2 or 3 Entities

1 Provide Problem Statement
Provide Concept Design
Provide indicative cost and schedule

Invite Innovative Solutions that meet / beat the desired Value Creation

Develop
Innovative Solutions to exceed Expectations in terms of
a. Performance
b. De-risking Schedule
c. Safe Working Environment
d. Future proofing
e. Optimisation

Demonstrate
- How Value will be added for the whole of life (WOL)?
- Constructability
- Technical Know-How Key Team Members

Contract Awarded
Baseline Established
Best For Project
Low Risk High Confidence Solution
Collaborative Commercial Arrangement
Full alignment

Develop Robust Cost Estimate and Schedule

Risk Based Decision-Making

Develop KPIs / KRAs
Performance Measures
– Lead / Lag Indicators
- Balanced Score Card
Incentive Schemes
(Risk / reward)

Entities to manage their own construction risks

Create Chinese Wall between the Entities to protect their IPs

Apply Lean 6-Sigma Principles

Carryout Substantial Investigations during the Development Phase to De-Risk the project

Obtain Regulatory Approvals to inform the design solutions

Unsuccessful Entities are paid for their IPs if used

Maintain Transparency

Integrated Schedule and Cost Risk Assessment

Entities to engage their subbies and suppliers during this phase

Do NOT transfer Owner's risks to the Contractor

No Master-Slave Relationship

No Win-Lose Mentality

Development Phase

Effective Program Governance Aligns with Corporate Goals and Governance

Governance and Alignment

Develop Designs further

Establish Robust Internal Controls Systems
- Baseline Cost
- Baseline Schedule
- Performance Measures
- Lead and Lag Indicators
- Procurement of Long Lead Items
- Effective Communication
- Change Management
- Risk Management
- Dashboards / Reporting

Incentives - Risk and Reward

Scan for External Environment Risks to De-Risk

Collaborative Commercial Environment

Transformational Leadership

Competent Team
Build High Performance Team
Shared Values / Behaviours

Leadership and Competent Team

Delivery Phase

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Questions?

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Thank you

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