Cooperative Research Centre for Construction Innovation (CRC CI)

PROJECT DIAGNOSTICS

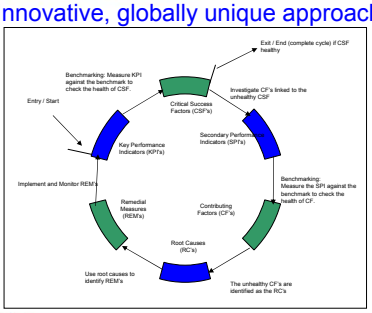
Project Diagnostics - Aim

A Diagnostic Tool that can be used to:

- Objectively investigate the state of health of a construction project
- Identify the specific root causes of any poor health
- Suggest generic remedial measures to improve project performance and outcomes for all stakeholders in the supply chain

Project Diagnostics - Methodology

Innovative, globally unique approach



Critical Success Factors

- Cost
- Time
- Quality
- Relationships
- Environment
- Safety
- Stakeholder Value

Key Performance Indicators

- Maximum objectivity maintained
- Measurable
- Sensitive
- Able to be benchmarked
- Independent – not duplicated
- Reflect reality
- Applicable to multiple project phases
- Applicable across the range of project sizes

Contributing Factors/Root Causes

- Unhealthy CSF's further investigated through Contributing Factors (CF's)
- CF's investigated through applying Secondary Performance Indicators (SPI's)
- SPI's determine subset of CF's as Root Causes
- SPI's applicable across the range of project sizes
- SPI's applicable to multiple project phases

Why use Project Diagnostics?

- IS YOUR PROJECT GOING OFF THE RAILS?
- DO YOU KNOW WHY?
- DO YOU WANT TO KNOW WHY?
- DO YOU WANT TO KNOW WHAT TO DO ABOUT IT?
- DO YOU WANT TO SAVE YOUR BUSINESS CASE?
- DO YOU WANT TO AVOID BAD PUBLICITY?

Why use Project Diagnostics?

- COST EFFECTIVE? NO DOUBT ABOUT IT.

  Boston Arterial Road project in USA was $US6 billion over budget – Project Diagnostics could have been used here! Cost of utilising Project Diagnostics insignificant compared to costs of failing projects.

- MUTLIPLE BENEFITS –

  a 3-in-1 package that identifies areas of poor project health, pinpoints the root causes and also suggests remedial measures.

Why use Project Diagnostics?

- DEVELOPED JOINTLY BY RESEARCH & INDUSTRY –

  Rigorous development drawing on extensive experience from industry and world class research organisations.

Project Diagnostics – Benefits to Industry

- Better project outcomes through achievement of objectives
- Methodology designed around holistic view of project delivery through supply chain
- Financial benefits for supply chain through timely identification of specific problem areas
- Higher rate of successful projects

Project Diagnostics – Benefits to Industry

A powerful tool with the potential to have a significantly positive impact on the construction industry

WATCH THIS SPACE

CRC-CI (Australia)

Program A - Business and Industry Development

Program B - Sustainable Built Assets

Program C - Delivery and Management of Built Assets

→ Project Diagnostics

Project diagnostics team

Arup Australasia – John Tsoukas, Sheldon Sherman
CSIRO – Paul Tilley
John Holland – Chris Evans
QLD Department of Main roads – Mike Swainston
QLD Department of Public Works – John Collin
QUT – Tony Sidwell, Matthew Humphreys, Daniyal Mian

Project diagnostics aim

To develop a system which can:

- recognise areas where a project may be underperforming
- identify the cause of poor performance
- suggest ways to improve the performance of the project

Options for model development

- Develop a model from scratch
- Adapt an existing model to suit construction:

  Mechanical health
  Human health

Similarities between human health and construction project health

- Health affects performance
- Symptoms of poor health exist
- Symptoms can be used as a starting point to quickly assess health
- Symptoms of poor health are not always present or obvious

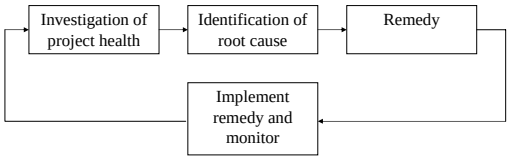
Similarities between human health and construction project health cont…

- State of health can be assessed by measuring key areas and comparing these values to established norms
- Health changes temporally
- Remedies can often be prescribed to return good health
- Correct, accurate and timely diagnosis of poor health can avoid small problems becoming large

The system needed to be:

- broadly applicable
- easily implemented in projects whether at the outset or brought in after a project has started
- able to rapidly diagnose poor health
- versatile so that it can be used where health problems are known and unknown
- able to accurately identify the cause(s) of the health problem
- able to relate the health problems to a remedy which can be instigated and monitored

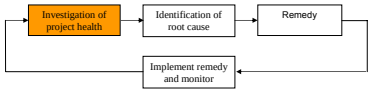
Establishment of basic model:



Method to investigate project health:

Main Critical Success Factor (CSF) themes

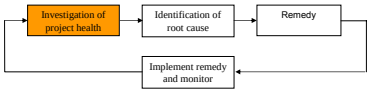
- Time
- Cost
- Quality
- Relationships
- Safety
- Environment
- Stakeholder's Value



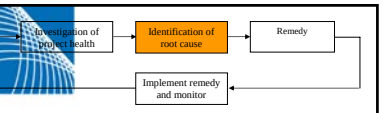
Method to investigate project health:

Key performance indicators:

- Easily measurable
- Sensitive
- Able to be assessed
- Independent
- Reflect reality



CSF	Proposed indicators	Explanation of indicator
Cost	CPI (Cost performance indicator)	CPI = BCWP / ACWP Where: BCWP= budgeted cost of work performed ACWP = actual cost of work performed CPI ≥ 1 indicates a healthy project CPI< 1 indicates an unhealthy project
	PJCI (Projected cost indicator)	PJCI = BAC / EAC Where: BAC = budgeted cost at completion EAC = estimated cost at completion (i.e. cost to date plus revised estimate of work remaining) PJCI ≥ 1 indicates a healthy project PJCI< 1 indicates an unhealthy project



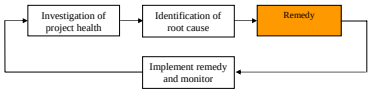
Identification of root cause:

- CSF's which are found to be unhealthy become the focus of the root cause investigation
- Contributing factors (CFs) related to each "sick" CSF theme are used to identify the root cause
- Between 5 and 25 CFs per CSF
- Contributing factors have been identified through a pilot study and literature review
- Secondary performance indicators (SPIs) are used to evaluate the state of the contributing factors

CSF	Contributing Factors	
Cost Overrun	Inaccurate cost estimate	
	Consultant / contractors lack of project type experience	
	Inflation	
	Lack of trust in contractors and consultant by client	
	Adoption of inappropriate contract type.	
	Lack of risk allocation	
	Financing / Cash Flow problems	

Remedy:

- May take the form of “Lessons Learnt”
- Based on previous project experience from case studies and literature review
- Require monitoring to assess their effect



Software Snapshots

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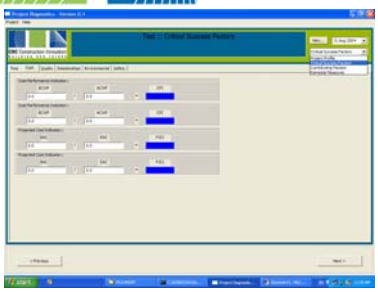

Development Partners

John Holland
ARUP
QUT
CSIRO
Queensland Government Department of Public Works
Queensland Government Department of Main Roads