

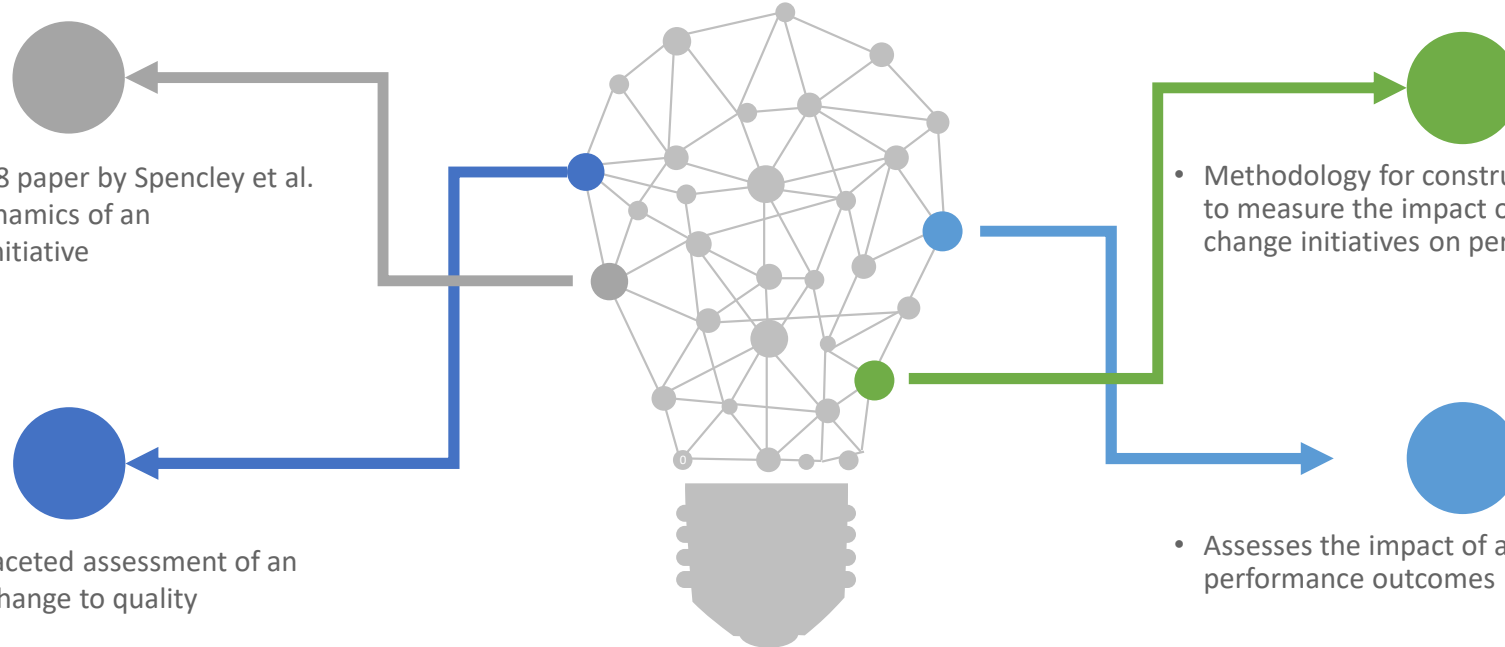
THE IMPACT OF IMPLEMENTING A SYSTEM APPROACH TO QUALITY: A GENERAL CONTRACTOR CASE STUDY

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SYSTEMS APPROACH TO QUALITY: A Multi-Step Study

ASSESSING IMPACT OF ORGANIZATIONAL CHANGE FOR A SYSTEMS APPROACH TO QUALITY by Gordon et al.

THE IMPACT OF IMPLEMENTING A SYSTEM APPROACH TO QUALITY: A GENERAL CONTRACTOR CASE STUDY by Gordon et al.



- Builds from 2018 paper by Spencley et al.
- Assesses the dynamics of an organizational initiative

- Provides multifaceted assessment of an organization's change to quality

- Methodology for construction practitioners to measure the impact of organization change initiatives on performance

- Assesses the impact of an SAQ on performance outcomes

AGENDA

- Theory: Why a System Approach to Quality (SAQ)?
- SAQ Development and Characteristics
- Research Methodology
- Analysis: Cultural and Quantitative Performance Outcomes
- Conclusion
 - The Impact of SAQ on Project Success
- Future Development and Limitation

INTRODUCTION

5%

Average rework contribution
to construction industry in the
U.S.

\$87B

Spent on rework out of \$1.75T
spent on construction in the
U.S. 2017

22%

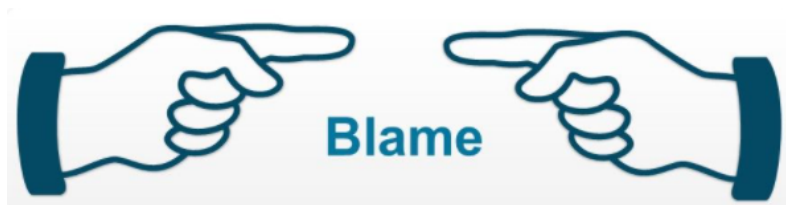
Potential increase in schedule
overrun due rework

52%

Potential increase in cost
overrun due rework

THEORY: Why a System Approach to Quality (SAQ)?

Rework Traditional View



- Bad individual behaviour
- People unreliability
- Linear causation

Vs.

Complex Systems View



- Complex systems
- Wide diversity of elements
- Interacting management layers

THEORY: Management of Complex Systems

- Give feasibility to process and outcomes
- Encourage diversity of perspectives when making critical decisions
- Anticipating and monitoring small changes
- Understanding the gap between prescription and practice
- Creating an environment that supports resilience

SYSTEMS APPROACH TO QUALITY: Implementation Map

Build from Knowledge & Information

Project teams start with the project information and a working understanding of what others have learned and identified as Distinguishing Features of Work (**DFOW**)

Points of Release

Project teams also identify key Points of Release (**POR**) in the project life cycle

Align Teams to Measurable Acceptance Criteria (MAC)

The process involves accountable stakeholders communicating and aligning on expectations for the POR

Evaluate Delivered Product

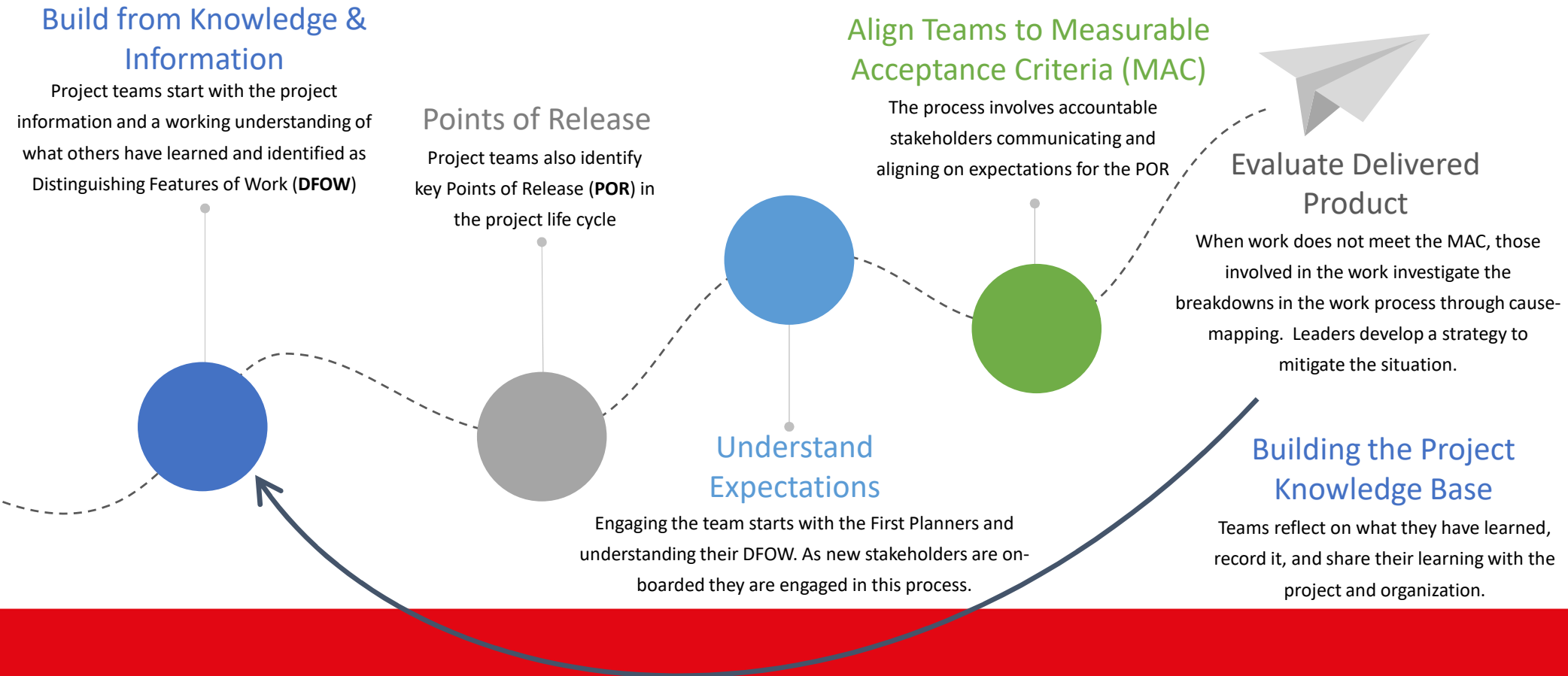
When work does not meet the MAC, those involved in the work investigate the breakdowns in the work process through cause-mapping. Leaders develop a strategy to mitigate the situation.

Building the Project Knowledge Base

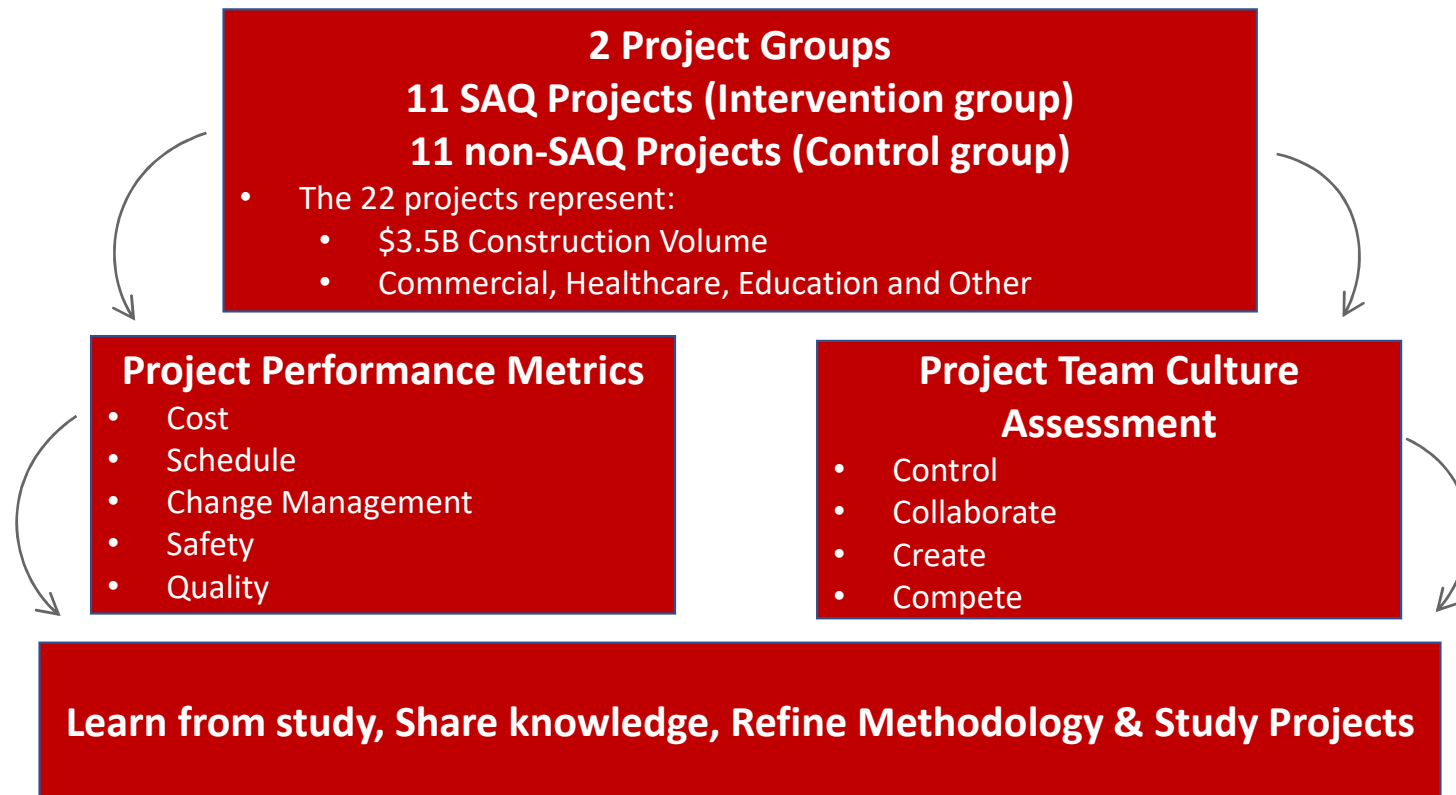
Teams reflect on what they have learned, record it, and share their learning with the project and organization.

Understand Expectations

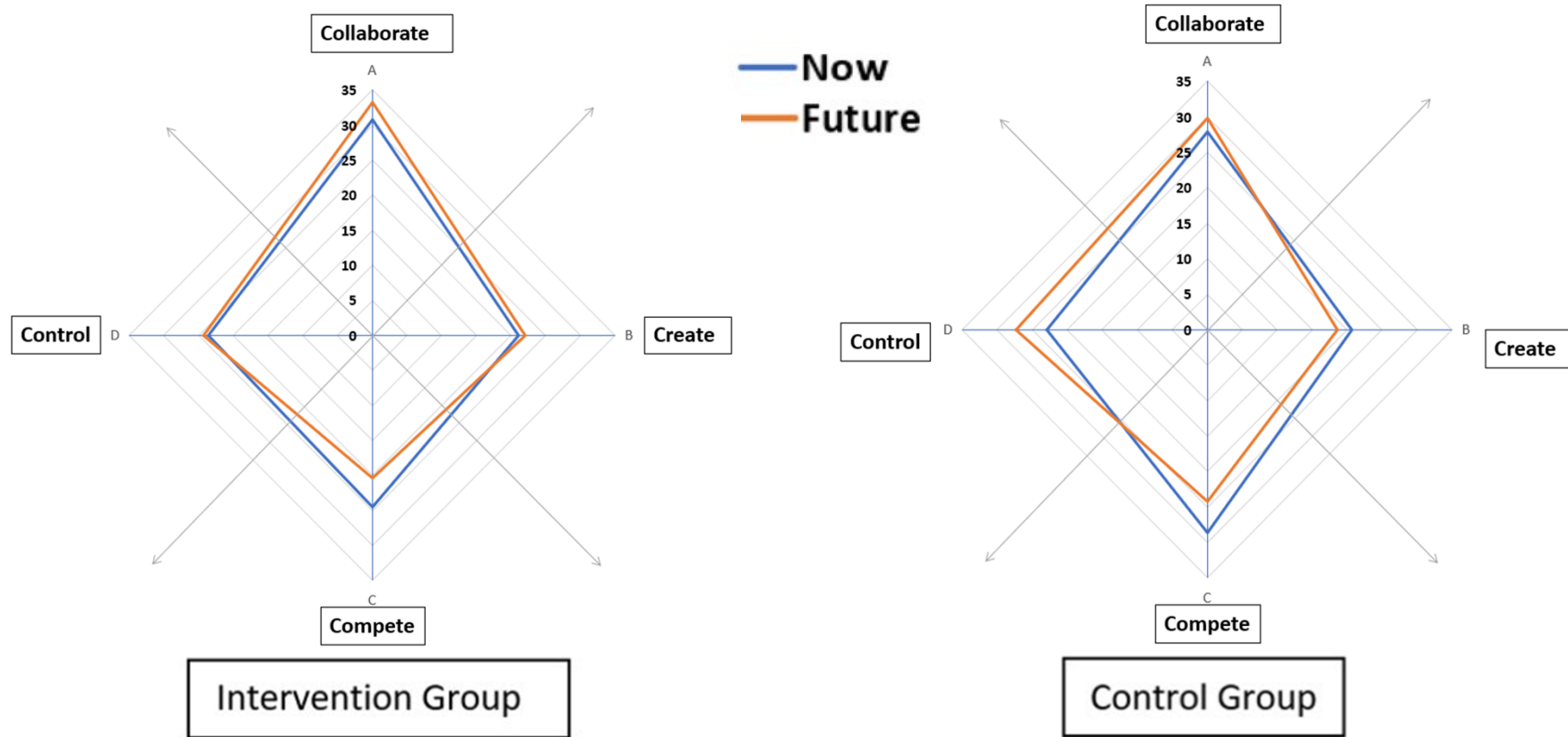
Engaging the team starts with the First Planners and understanding their DFOW. As new stakeholders are on-boarded they are engaged in this process.



RESEARCH METHODOLOGY: to evaluate effect of implementing SAQ



CULTURAL ASSESSMENTS: Quinn's Competing Values Framework



RESULTS: Quantitative Performance Metrics

Area	Metric	Formula	Unit of Measure
Cost	Cost Growth	$\frac{\text{Actual Cost} - \text{Intial (Anticipated)Cost}}{\text{Intial Cost}}$	Percentage of the total cost
	Fee Gain	$\frac{\text{Fee Erosion} + \text{Fee Gain} + \text{Nonreimbursables}}{\text{Contract Fee}(\text{Current} - \text{Appraoved Fee for changes})}$	Percentage of total fee
Schedule	Schedule Growth from Mobilization	$\frac{\text{SC at Trend (Actual)} - \text{SC at Mbilization}}{\text{Actual SC} - \text{Actual Mobilization}}$	Percentage of the total duration
Change Management	Change percent duration	$\frac{\text{Ave. Potential Change Items (PCI)Processing Time}}{\text{Actual Construction Duration}}$	Percentage of total duration
	Value of Percent Changes	$\frac{\text{Total Value of Change Orders}}{\text{Actual Contract Cost (Revised)}}$	Percentage of the total cost
Safety	Incidents per \$100M	$\frac{\text{Number of Incidents}}{\$100M}$	Number per million dollars
Quality	Value of reported Claims	$\frac{\text{Order of Magnitude of Reported Claims}}{\text{Total Contract Cost}}$	Percentage of the total cost

Table 1. Performance Metrics Calculations

RESULTS: Quantitative Performance Metrics

Area	Performance Metric	Median	
		Intervention group	Control group
Cost	Cost Growth	5%	9%
	Fee Gain	4%	-35%
Schedule	Schedule Growth at Mobilization	11%	18%
Change Management	Change Percent Duration	14%	18%
	Value of Percent Changes	5%	13%
Safety	Incidents per \$100M	1.5	1.9
Quality	Value of Claims as a Percentage of Contract Cost	0.14%	0.87%

Table 2. Performance Metrics Medians

CONCLUSIONS

SAQ projects had better performance for profitability, cost predictability and improved schedule achievement.



Culture on SAQ projects was perceived to be more collaborative, less competitive, & had less variability in performance outcomes.



This methodology can be used to measure the impact of other change management initiatives on project teams.



FUTURE STUDIES

Refine the methodology for the study.



Larger datasets to determine statistical analysis.



Perform assessments of project culture during different phases in the project lifecycle.



THANK YOU!

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