

Solving the **Unsolvable**

Project Management for Complex Problems

CASE STUDY

A VISION FOR SUCCESS

How Solutions for Complex Problem Transformed a School District

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Course Description

Have you ever faced a school project where the challenges felt insurmountable due to tight timelines, uncertain priorities, conflicting requirements, and limited resources?

In this presentation, we will examine the Project Manager's role in tackling complex problems.

We will explore how K-12 Education Capital Improvement Projects present the project manager with inherently problematic conditions. This session aims to uncover strategies for solving some of the more complex problems occurring in these projects.

Drawing on insights from interviews, experiences and expertise of professionals involved in Education CIP's, attendees will discover real-world strategies for project managers that provide equitable, healthy, and safe learning environments.



Learning Objectives

At the end of this course, participants will be able to:

1. Project Management in K-12 Education Capital Improvement Projects

Understand the role of Project Management in K-12 Education Capital Improvement Projects for mitigating risk, imparting accessibility, security, safety, and environmental considerations into an instructional facility for the health and well-being of students.

2. Engaging in Complex Problems

Learn about uncovering complex problems to address district goals and objectives while maintaining welfare goals, equitable access, social interaction, and environmental health.

3. Solution Management

Discover management strategies and tools for implementing solutions to complex problems throughout the project life-cycle that prioritize the health, safety, and welfare of students, staff, and the community.

4. Enable Creative Solutions

Our final objective presents how complex problems can enable creative solutions while emphasizing their impact on health, safety, and welfare.



Solving the Unsolvable

Project Management for Complex Problems

Presenters



Jim McSherry
Project Manager
GPD GROUP - HOUSTON

"I never intended to be a project manager. However, I found out I wasn't too bad at it once I figured out it was about serving people. I never have thought of myself as a people person. The thing is, it's very rewarding to see the kids and teachers on the first day of school with their eyes lit up, seeing a space full of color and life, and it becomes their home. The idea that me and my team are part of that is just amazing." - Jim



Greg Louviere NCARB, AIA
Design Manager
GPD GROUP - HOUSTON

"I've never been a Project Manager—never even aspired to be one. But after years working alongside some exceptional ones, especially Jim, I've come to admire their gift for turning complexity into clarity. Jim has a way of making the impossible look effortless—bringing clients, teams, and officials together to deliver something truly exceptional for the districts where he has worked." -Greg

Solving the Unsolvable

Project Management for Complex Problems

Our Intention

This presentation is intended to study how problems impact the role of project manager throughout the duration of a project. In this case, we are focused on those problems that impact project managers involved within a K-12 education capital improvement project.

- Educational facility projects are uniquely complex undertakings.
- They are time-bound, goal-driven, and
- Involve multiple stakeholders with often competing interests.
- Project managers in this field are no strangers to solving problems—but the kinds of problems we often face today are increasingly complex, systemic, and interconnected.

Solving the Unsolvable

Project Management for Complex Problems

I. K-12 Education Capital Improvement Projects

- 1) K-12 Education Capital Improvement Projects
- 2) Inherent Conflicts, Challenges & Problems in Education CIP's

II. Project Manager in CIP

- 3) Critical Role of Project Managers
- 4) Critical Qualities of an Effective Project Manager

III. Problem-Solving for Project Managers

- 5) Proactive Strategies for Complex Problems
- 6) Reactive Problem-Solving During Project Execution

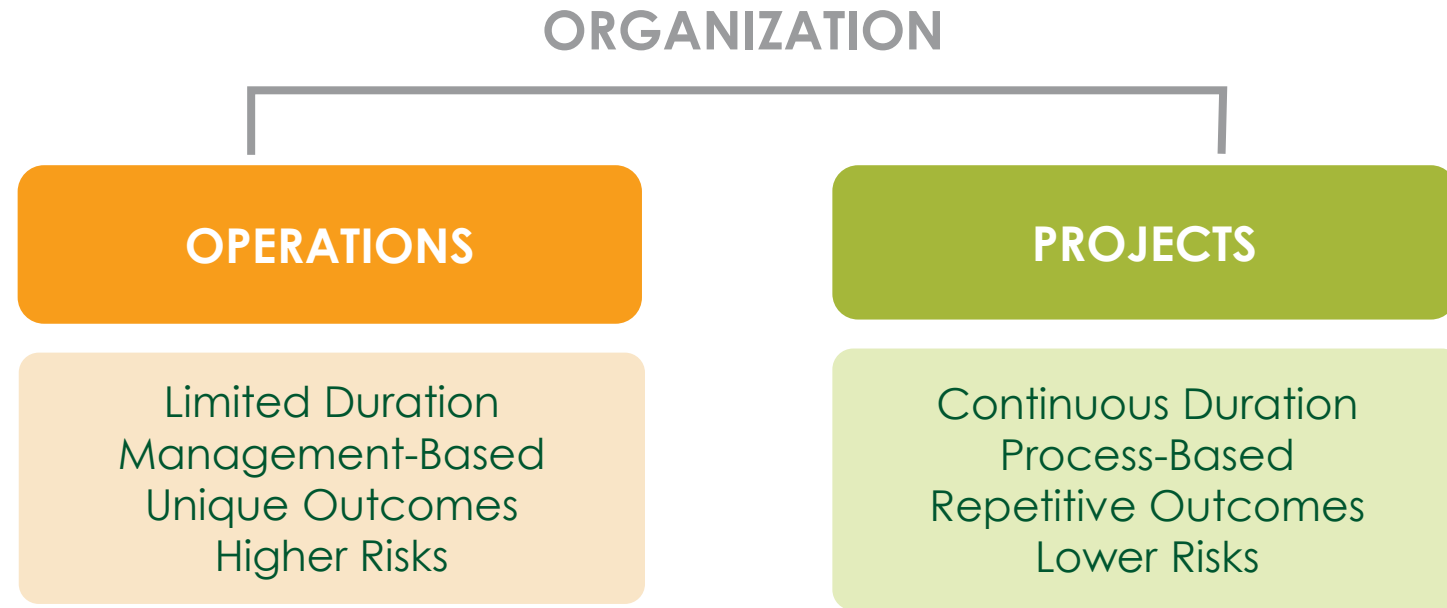


I. Define

I.

K-12 Education Capital Improvement Projects (Education CIP's)

K-12 Education Capital Improvement Project Operations and Projects in an Organization



“**Operations** keeps the lights on, **strategy** provides a light at the end of the tunnel, but **project management is the train engine that moves the organization forward.**” Joy Gumz

K-12 Education Capital Improvement Project

10 Defining Features of an Education CIP

01

Educational Mission Alignment

02

Long-Range Facility Planning

03

Stakeholder Engagement in
Communication & Collaboration

04

Capital Funding & Financial
Strategy

05

Regulatory & Educational
Compliance

06

Context & Community Integration

07

Safety & Security Priorities

08

Life-Cycle Efficiency and Long-Term
Operation

09

Academic & Program Flexibility

10

Governance, Oversight and
Accountability

K-12 Education Capital Improvement Project

10 Common Conflicts in Education CIP's

01

Competing Stakeholder Priorities

02

Budget Constraints alongside Project Vision

03

Timeline Pressures

04

Educational Program Changes During Design

05

Mismatched Expectations between Groups and Stakeholders

06

Regulatory Requirements vs. Practical Needs

07

Communication Gaps

08

Operational Disruptions

09

Political and Community Tensions

10

Scope Creep & Decision Delays



II. Manage



Managing the Project

Central Role of Project Managers

Central Role of Project Managers

Managing Project Complexity & Managing Alignment

CRITICAL FACTORS IN PROJECT MANAGEMENT

Design, Production & Construction

Facilitate Collaboration between architect, engineers, and district representatives

Diverse Interests & Priorities

Process for Listening and Responding to Diverse Voices

Scope, Schedule & Budget

Develops and Protect Scope of Work

Standards, Codes and Requirements

Coordinates with officials to ensure design compliance

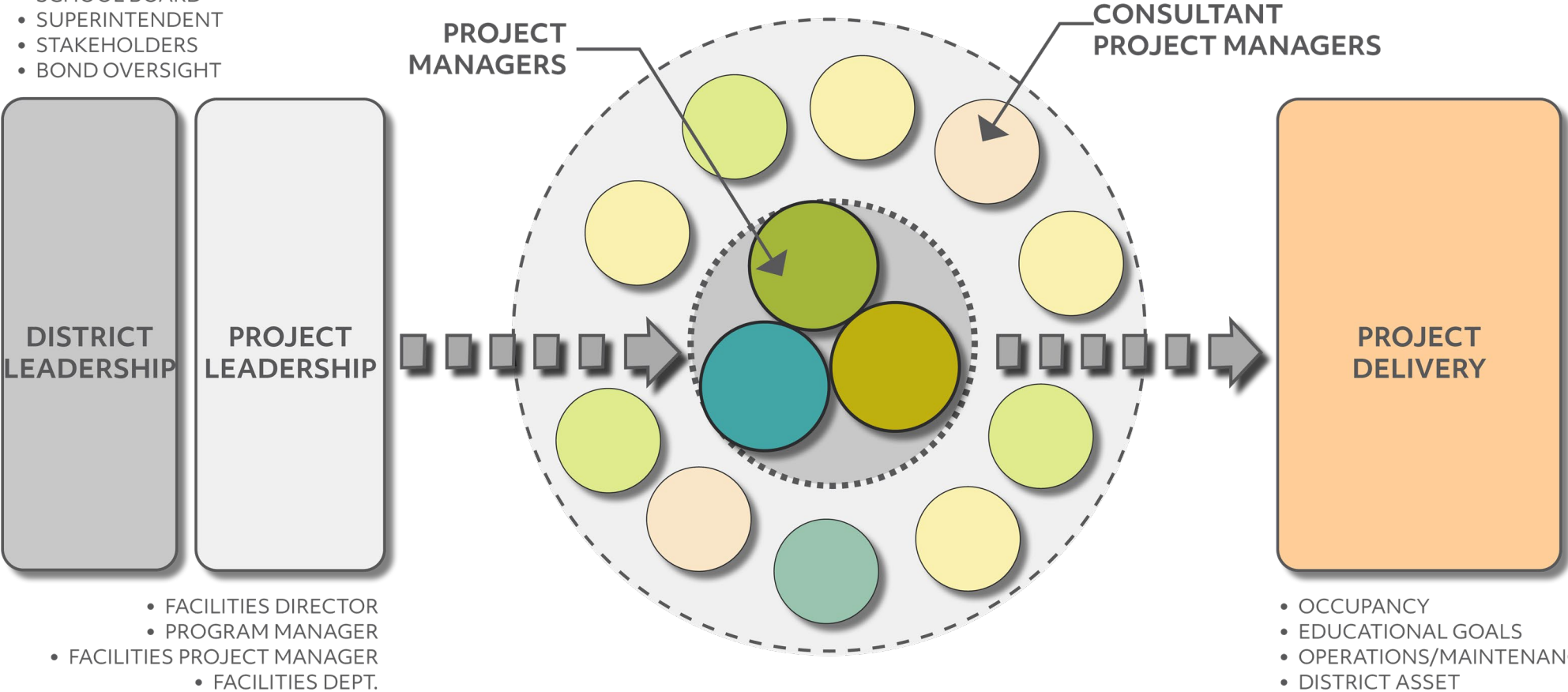
Community Trust

Ensures transparency and responsive to the community and shareholders

Central Role of Project Managers

Project Workflow Strategy

- SCHOOL DISTRICT
- SCHOOL BOARD
- SUPERINTENDENT
- STAKEHOLDERS
- BOND OVERSIGHT



- FACILITIES DIRECTOR
- PROGRAM MANAGER
- FACILITIES PROJECT MANAGER
- FACILITIES DEPT.

- OCCUPANCY
- EDUCATIONAL GOALS
- OPERATIONS/MAINTENANCE
- DISTRICT ASSET



Central Role of Project Managers

Project Management Organization Chart

School District & Community Leadership	School Board/Superintendent			
	Municipality, County & State Jurisdictions	School District Leadership	Community Stakeholders	Bond Oversight Committee
District Facility Planning & Construction	Facilities Project & Program Director			
	Facilities Project Manager			
Lead Project Managers	Facilities Project Manager Project Lead	Architectural Project Manager Design Process & Production Lead	Construction Project Manager Execution and Delivery Lead	
Consultant Project Managers	IT/Technology Project Manager	Civil Project Manager	Structural Project Manager	
	Structural Project Manager	Building Envelope Project Manager	Landscape Project Manager	
	Commissioning Agentn (CxA)	Acoustical Project Manager	Theatre / Performing Arts	



II. Manage



Managing the Project

Critical Qualities of an Effective Project Manager

Critical Qualities of an Effective Project Manager

Qualities Matrix

DILIGENCE

Situational Awareness

RESPONSIVE

Proactive Communication

Relentless Accountability

ENGAGEMENT

Adaptive Leadership

AGILITY

Critical Qualities of an Effective Project Manager

DILIGENCE

Situational Awareness

Ability to read the environment, maintain project stability and detect early signs of risk or misalignment.

PM's Must:

- Monitor political, social, and funding factors that impact project success.
- Recognize shifts in stakeholder priorities before they become issues.
- Proactive scanning and assessment allows PMs to anticipate challenges and adjust strategies.

Critical Qualities of an Effective Project Manager

RESPONSIVE

Proactive Communication

PMs are intentional communicators, not just messengers.

They:

- Engage in proactive communication and can anticipate concerns before they escalate
- Delivering consistent updates that promote transparency
- Frame messaging to foster trust with stakeholders and the community
- PMs shape the narrative of the project to maintain alignment and momentum.

Critical Qualities of an Effective Project Manager

Relentless Accountability

ENGAGEMENT

PMs own the outcome, not just the process.

They:

- Ensure all team members follow through on commitments
- Maintain focus on the project's objectives—no matter how complex the challenge
- Lead with integrity, holding themselves and others accountable for results

Critical Qualities of an Effective Project Manager

Adaptive Leadership

AGILITY

Leading through complexity and uncertainty, not just managing tasks.

PMs Must:

- Demonstrate flexibility and decisiveness when faced by changing conditions.
- As Adaptive leaders:
 - Reframe problems as opportunities
 - Make real-time decisions to keep projects on track
 - Inspire confidence when conditions shift unexpectedly

Critical Qualities of an Effective Project Manager

Lacking Vital PM Qualities

Negligent:

When situational awareness is lacking by the Project Manager, their negligent or uninterested attitude leads to greater project risk where some circumstances are left unnoticed until it threatens the outcome

Unresponsive:

Poor communication when a PM delays their response that often requires approvals to move forward, fosters delays, imparts confusion, frustration, and stakeholder disengagement

Disengaged:

Weak accountability, when the PM is disinterested in maintaining project status indicators, can result in missed deadlines, scope creep, and eroded stakeholder trust.

Ineffectual:

A project manager can become ineffectual through their inability to changing circumstances, often leading to rigid thinking and static progress.

Case Study

A VISION FOR SUCCESS

How Solutions to a Complex Problem Transformed a School District

Problem: In 2016, a school district faced numerous challenges:

- **High Growth rate from 2010-2015 (24%)**
- **High Percentage “at-risk” students (69%)**
- **88% Graduation Rate**
- **Aged and Damaged Instructional Facilities**
- **High Teacher Attrition Rates (23.6%)**

Solution: A newly appointed superintendent stepped in with a clear vision to solve these complex problems and in the process transformed an entire school district.



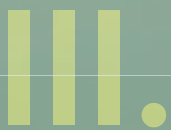
Case Study

A VISION FOR SUCCESS

How Solutions to a Complex Problem Transformed a School District

An inspiring case study on how a leader's vision led to:

- A Graduation Rate: From **88%** to **93.8%**
- Increased Teacher Pay — **\$6,000 above state average**
- A Dropout Rate Reduced to **2.4%**, Despite A **60% at-risk student population.**
- A Long-Range Master Plan and Bond Passage for construction of a new school high school and elementary school, several school additions, an early childhood center and a state-of-the-art athletic complex and stadium.





III. Process



Managing Complex Problems

5. Proactive Problem Management (Early Stages)

5) Proactive Problem Management (Early Stages)

a. Proactive Strategies in Project Management

- *Early-stage detection prevents complications*
- **Strategies in proactive project management**
 - Proactive Risk Management
 - Project Performance Evaluation
 - Proactive Planning
 - Establish Clear Expectations
- **Goal:** Identify and address potential issues and risks before they impact the project; a smoother, more successful outcome by anticipating problems and implementing preventative measures.



5) Proactive Problem Management (Early Stages)

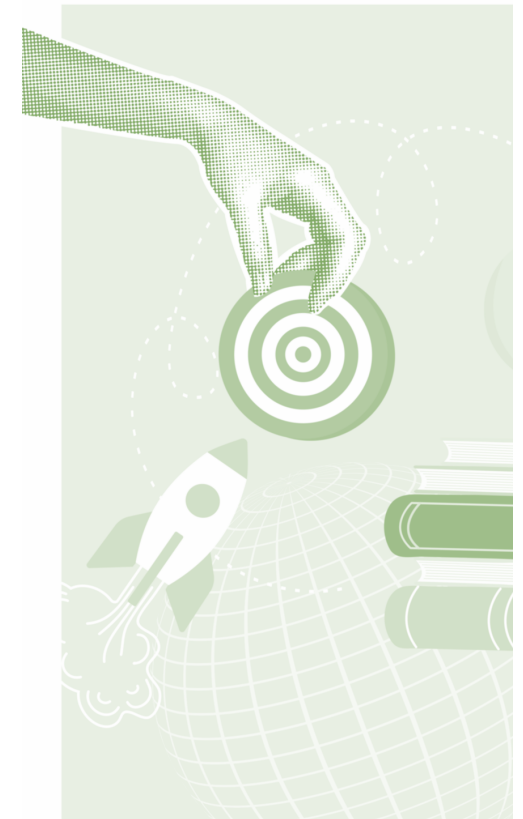
b. Trust Building with Stakeholders

Best Practices in Trust Building with Stakeholders

1. Consistent and transparent communication
2. Active listening
3. Demonstrate competency & responsiveness
4. Showing empathy and understanding
5. Delivering on promises and in managing expectations

Tools and Techniques in Trust Building

- Assessment & Identification Dashboard
- Kick-off & Report Meetings
- Visioning Sessions and Design Charettes
- Maintain Feedback among Stakeholders
- Early Risk Identification



5) Proactive Problem Management (Early Stages)

c. Leading Factors in Proactive Management

Communication as a Cornerstone:

Status reports are a vital part of your communications plan. These reports don't need to cover every stakeholder or be all things to all people. The goal should be to deliver the right information to the right people at the right time. Weekly Status Reports are the most common way to keep track of project progress.

Consistency is Key: Find a format and distribution method that works for your stakeholders and stick with it. They'll appreciate the predictability of the information they receive.

Measure Your Targets: Establish a way to measure your progress. These measurements should derive from your project status, stakeholder engagement, financial management, and team progress. Metrics are crucial for project reporting and monitoring. They should be used to measure your project's progress against goals throughout its lifecycle.

Keep It Simple: Simplicity ensures effectiveness. Simple reports help you maintain status and communication, allowing you to better manage the project.

Correct Yourself: Reporting accurate information keeps you aligned with your project and enhances your ability to manage it. Embrace diligence!

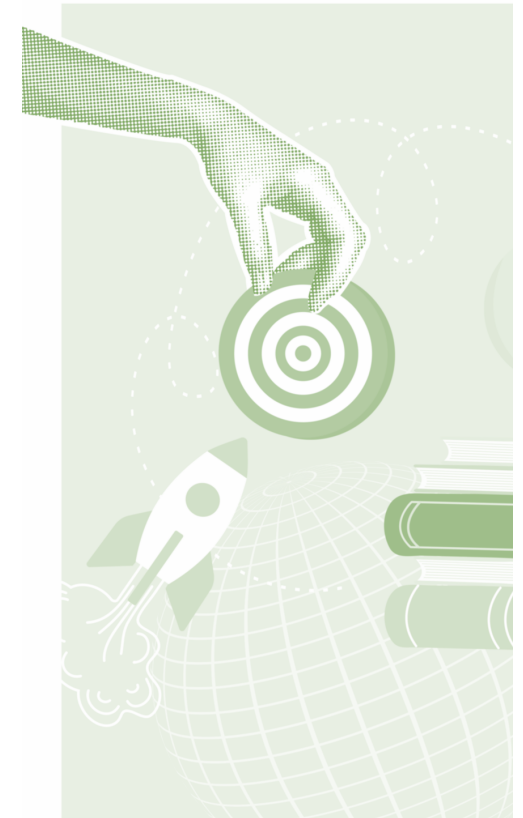
Adaptable Standards: Simplifying reports is easier when you maintain adaptable standards. Standards aren't always rigid rules. Use your creative energy to make your standards adaptable to circumstances, and tell a story to bring them to life.



5) Proactive Problem Solving (Early Stages)

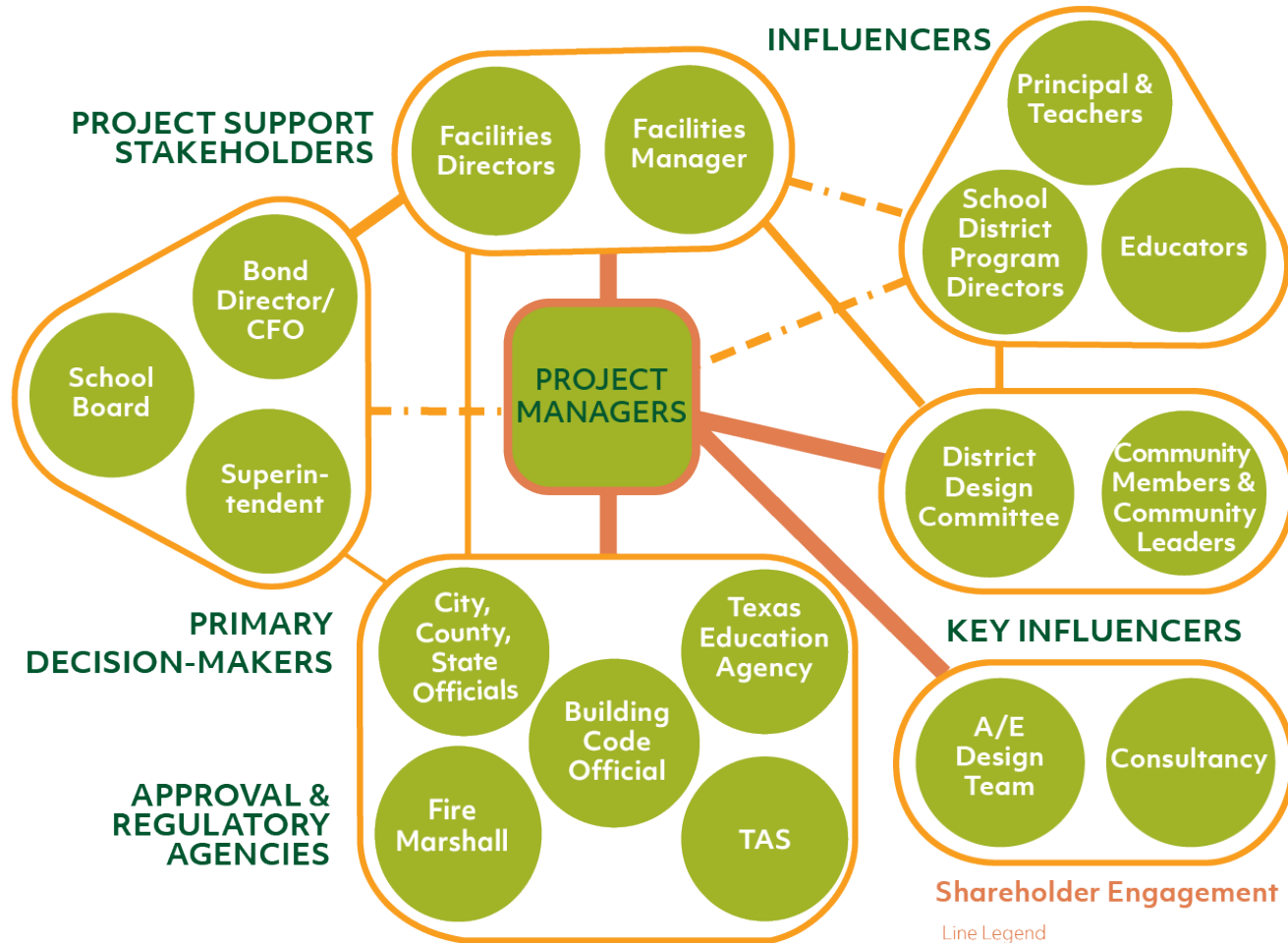
d. Proactive Tools & Technics

- Pre-Mortem Analysis
- Communication Management Plan
- Stakeholder Analysis & Mapping
- Regular Progress Reporting
- Open Communication Channels
- Critical Path Method (CPM)
- Key Performance Indicators (KPI)
- Feedback & Stakeholder Participation
- Planning & Risk Management Techniques



Tools & Techniques in Proactive Engagement

PM Stakeholder Map



Shareholder Engagement

Line Legend

- PM-Authority/Approval
- Decision authority or approval
- Advisory/Collaborative
- Information / Communication





III. Process



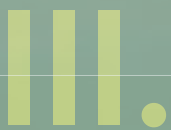
Managing Complex Problems

6. Adaptive Problem Management (Later Stages)

6) Reactive Problem-Solving During Project Execution (Later Stages)

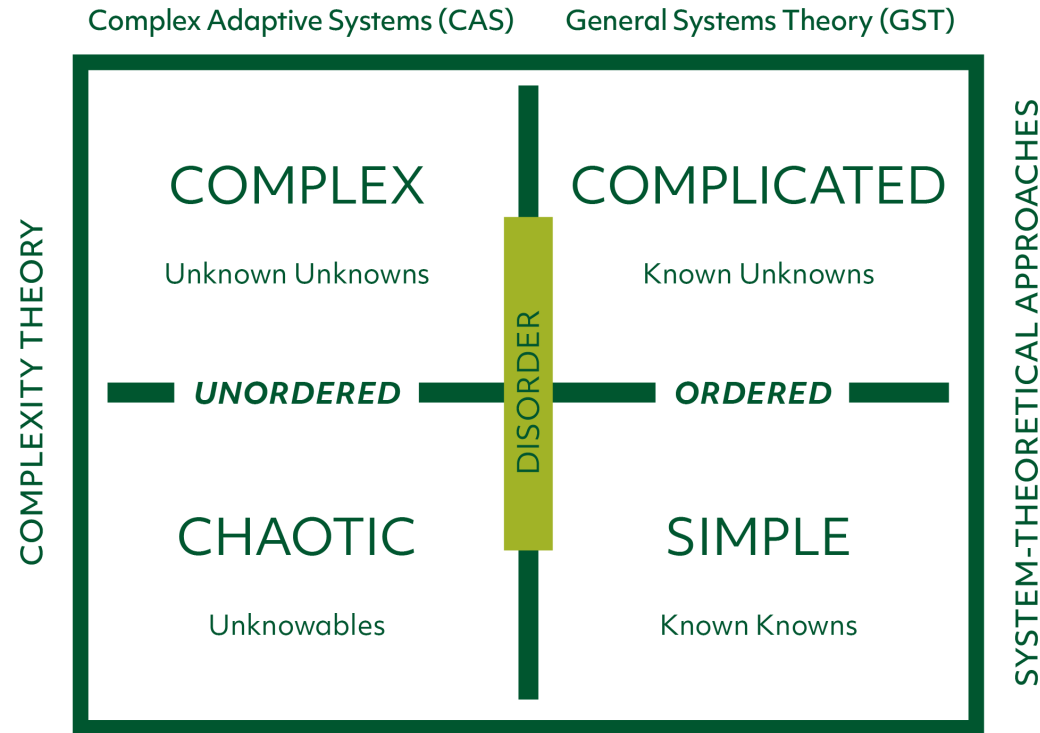
Complex Problem Scenarios in Education CIP's

- Common scenarios:
 - Mid-project funding cuts or bond shortfalls
 - Stakeholder conflicts on scope or design intent
 - Construction delays impacting school operations
 - Public opposition or negative media coverage
- Solutions require:
 - Clear decision-making frameworks
 - Strong PM leadership and adaptive team responses



6) Reactive Problem-Solving During Project Execution (Later Stages)

Assessment Tool: Understanding Problem Types



Cynefin (KUH-neh-vin) Framework

The Cynefin Framework developed by Dave Snowden and Cognitive Edge. © Cognitive Edge. Used for educational and non-commercial purposes.



6) Levels of Problem Complexity

LEVEL 1 Localized Issue



LOW

- Affects one or more project dimensions.
- Limited impact on secondary factors.
- Requires minor intervention with limited investment on project solution.

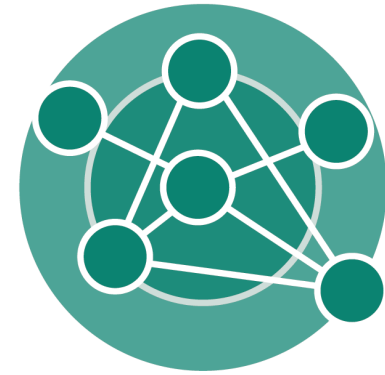
LEVEL 2 Operations Challenge



MODERATE

- Affects two or more project dimensions.
- Minor indirect impact on secondary factors.
- Requires intervention with moderate investment on project solution.

LEVEL 3 Critical Disruption



HIGH

- Affects multiple project dimensions.
- Major indirect impact on secondary factors.
- Requires a high degree of intervention to combat project impact.



5) Project Impact and Problem Complexity

Project Impact & Complexity Analysis Matrix

PROJECT MANAGEMENT	LEVELS OF PROBLEM COMPLEXITY		
CRITICAL IMPACT AREAS	LOCALIZED ISSUE (Low Complexity)	OPERATIONAL CHALLENGE (Moderate Complexity)	CRITICAL DISRUPTION (High Complexity)
	A	B	C
1 Task Execution Management	Minor issue affecting one task, easily fixed with small adjustments.	Workflow disruption within a team, requiring minor rescheduling or task reassignment.	Task failure causes bigger project delays, requiring high-level intervention.
2 Scope & Change Management	Small scope clarification needed, but does not impact deliverables.	Scope change requiring revised workplans and additional approvals.	Uncontrolled scope creep risks project feasibility, requiring a strategic reset.
3 Schedule & Time Management	Minor task delay, no impact on milestones.	Delays affecting dependencies, requiring adjustments in sequencing.	Severe timeline disruption that risks missing key deadlines.
4 Cost & Resource Management	Small cost adjustment, covered within contingency.	Budget overruns requiring reallocation of funds or cost-cutting measures.	Major cost overruns jeopardizing the entire project, requiring external funding solutions.
5 Stakeholder & Public	Minor stakeholder concerns, resolved easily.	Stakeholder dissatisfaction requiring formal communication and issue resolution.	Major loss of trust leading to legal, political, or funding consequences.



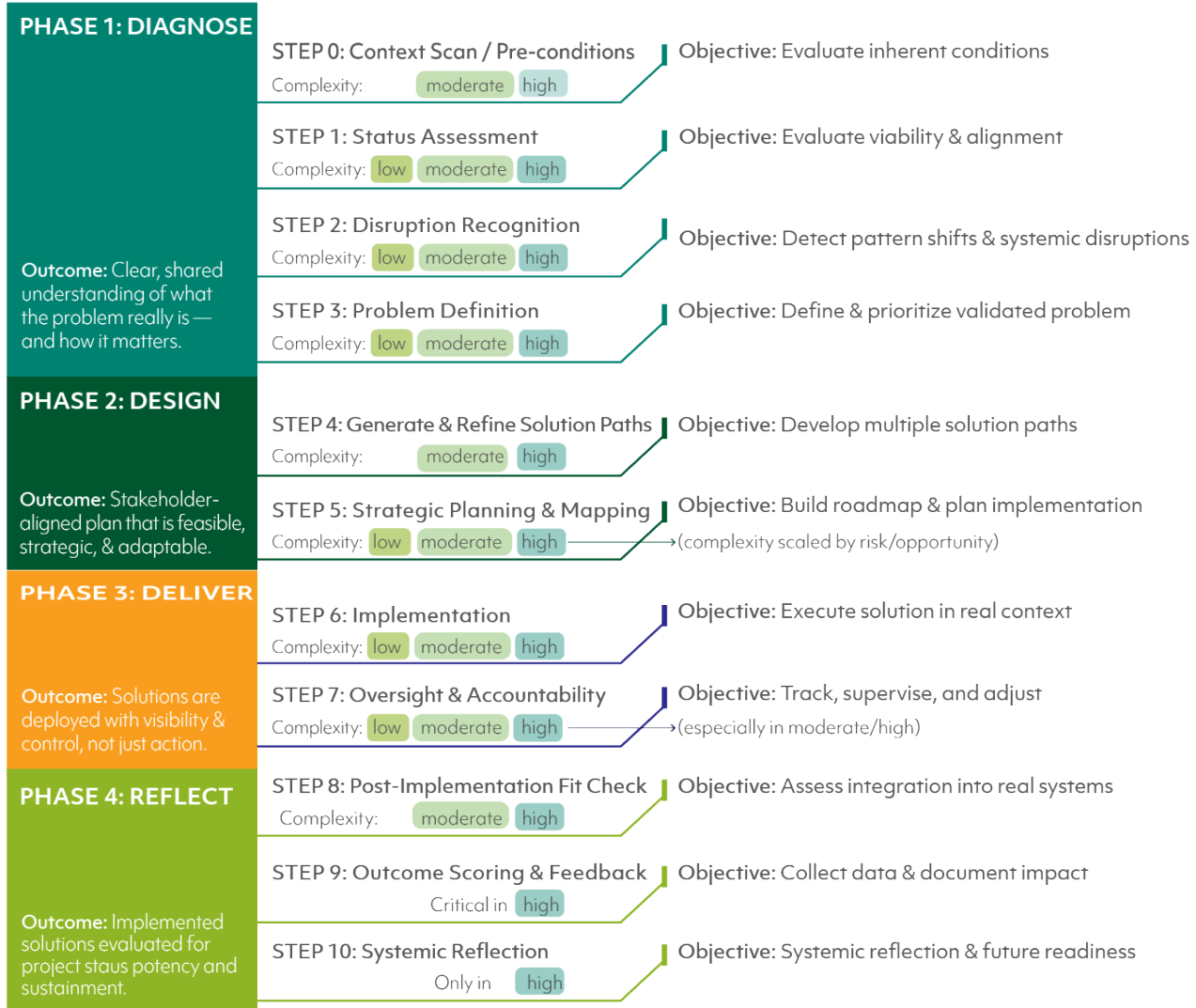


III. Process



10+1 FRAMEWORK

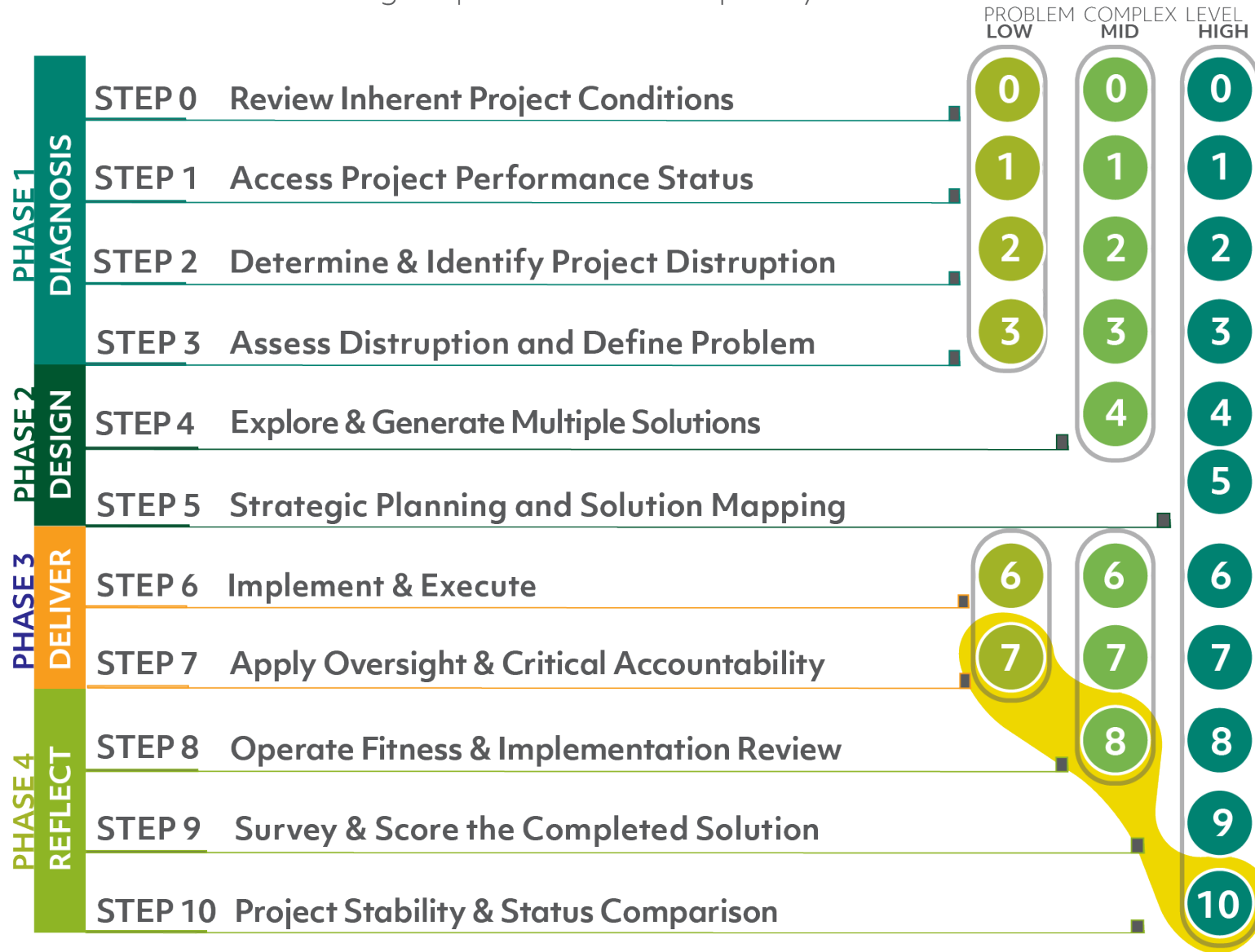
An Adaptive Project Management Framework for Complex Problem-Solving





10+1 FRAMEWORK

Sective Problem-Solving Steps for Three Complexity Levels



10+1 FRAMEWORK: Phase 1

Adaptive Project Management Framework for Complex Problem-Solving

PHASE 1: DIAGNOSIS

Outcome: Develop a clear, shared understanding of what the problem really is — and why it matters.

Step 0 Assessment of Inherent project Conditions and Problem associated with the pre-conditions.

Step 1 Status Assessment (Viability & Continuity)

Objective: Establish whether the current state of a project aligns with expected outcomes.

Key Actions:

- Monitor existing patterns of engagement.
- Identify early signs of misalignment.
- Confirm operational and strategic benchmarks.

Step 2 Determine & Identify Project Disruptions

Objective: Determine whether deviations from expected outcomes signify significant disruptions.

Key Actions:

- Recognize pattern shifts in performance or engagement.
- Assess whether these shifts are isolated anomalies or systemic issues.
- Define how the disruption affects key outcomes.

Step 3 Assess Disruption and Define Problem

Objective: Conduct Root Cause Analysis define problem before proceeding to solutions.

Key Actions:

- Identify and validate multiple problem perspectives rather than assuming a single issue.
- Use comparative analysis to evaluate different problem sets.
- Engage stakeholders to refine and prioritize problem statements.
- Test initial interpretations before committing to a problem definition.



10+1 FRAMEWORK: Phase 1

Adaptive Project Management Framework for Complex Problem-Solving

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10+1 FRAMEWORK: Phase 2

Adaptive Project Management Framework for Complex Problem-Solving

PHASE 2: DESIGN

Outcome: Stakeholder aligned planning for feasible, strategic and adaptable solution planning

Step 4 Explore & Generate Multiple Solutions

Objective: Develop solutions by evaluating their viability and refining them through iteration.

Key Actions:

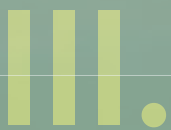
- Develop a set of solution pathways addressing the defined problem.
- Rank solutions based on impact, feasibility, and alignment with priorities.
- Engage in iterative testing, stakeholder feedback, and refinements.
- Ensure solutions align with the root cause analysis from Step 3.

Step 5 Strategic Planning & Solution Mapping

Objective: Organize solutions into an actionable, stakeholder-driven plan.

Key Actions:

- Engage stakeholders to determine strategy and execution pathways.
- Prioritize solutions based on constraints, opportunities, and urgency.
- Develop a Solution Roadmap with key milestones and dependencies.
- Create a communication and documentation plan for execution.



10+1 FRAMEWORK: Phase 3

Adaptive Project Management Framework for Complex Problem-Solving

PHASE 3: DELIVER

Outcome: Solution are deployed with transparency and control, not just an action

Step 6 Implementation & Execution

Objective: Apply the planned solution(s) in a structured, real-world context.

Key Actions:

- Assign roles and responsibilities to ensure accountability.
- Implement solutions through phased or full deployment.
- Integrate adaptive mechanisms to allow for real-time adjustments.
- Maintain stakeholder engagement throughout execution.

Step 7 Application Oversight & Critical Accountability

Objective: Supervise, monitor, and track implementation progress against planned outcomes.

Key Actions:

- Conduct real-time performance monitoring and tracking.
- Address unexpected challenges through adaptive interventions.
- Engage stakeholders for feedback loops and mid-course corrections.
- Ensure solutions are being applied as intended without drift.





10+1 FRAMEWORK: Phase 4

An Adaptive Project Management Framework for Complex Problem-Solving

PHASE 4: REFLECT

Outcome: Implemented solutions evaluated for project status potency and sustainment

Step 8 Operational Fit & Post-Implementation Review

Objective: Assess how well the implemented solution is functioning in real-world conditions.

Key Actions:

- Observe how the solution integrates into existing operational frameworks.
- Identify adjustments needed for optimization.
- Compare real-world functionality to initial expectations and planning.
- Ensure the solution achieves a stable and sustainable state.

Step 9 Surveying & Scoring the Completed Solution

Objective: Test, survey, and formally document the effectiveness of the implemented solution.

Key Actions:

- Conduct stakeholder and user surveys to gather feedback.
- Use scoring methodologies or performance metrics to evaluate outcomes.
- Document findings for future reference and institutional learning.
- Assess whether further refinements are needed.

Step 10 Pattern Stability Evaluation & Systemic Comparison

Objective: Compare the new operational pattern with the original disrupted pattern to evaluate stability.

Key Actions:

- Assess whether the reframed solution has restored functional stability.
- Compare the pre-disruption pattern with the post-solution state.
- Determine whether the new system offers resilience against future disruptions.
- Identify insights to refine future problem-solving frameworks.



FINAL THOUGHTS

Managing K-12 Education Capital Improvement Projects

Final Thoughts: Recap

I. Defining Education Capital Improvement Projects

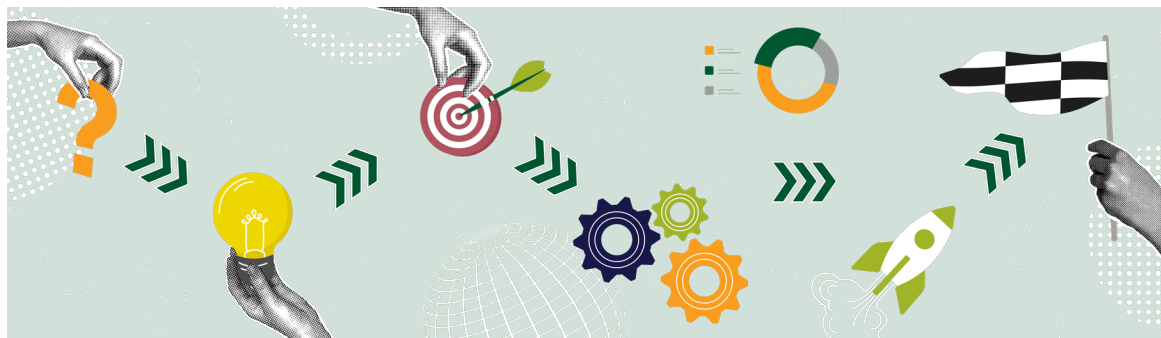
- Educational Capital Improvement Projects are complex, high-stakes initiatives.
- They have a wide range of impact on learning outcomes, community trust, and generational opportunity.
- Successful outcomes require alignment with Long-Term Planning and educational goals, not merely reaching metrics.



Final Thoughts: Recap

II. Managing the Project

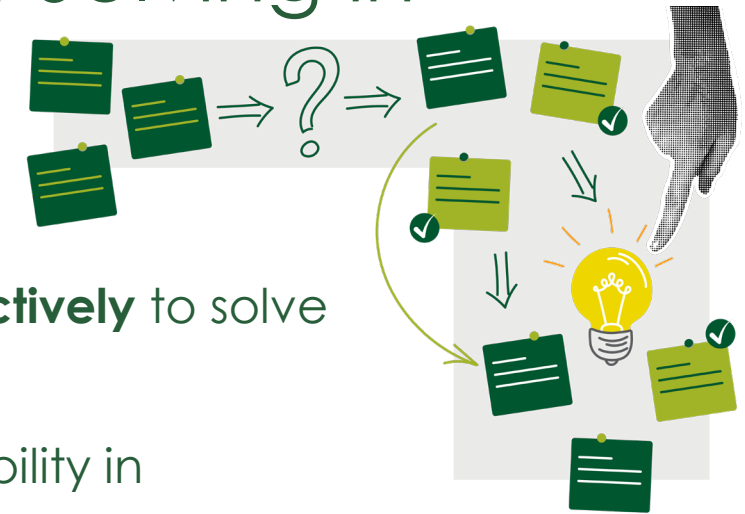
- **PMs are Strategic Leaders** bridging the gap between vision and execution.
- The successful Project Manager practices with **4-Key Qualities**:
 - Situational Awareness
 - Adaptive Leadership
 - Proactive Communication
 - Relentless Accountability
- **Project Managers don't just manage, they have leadership values to the project.** They are the facilitators of positive change in communities, school districts and the lives of students themselves.



Final Thoughts: Recap

III. Mastering Complex Problem-Solving in Educational CIPs

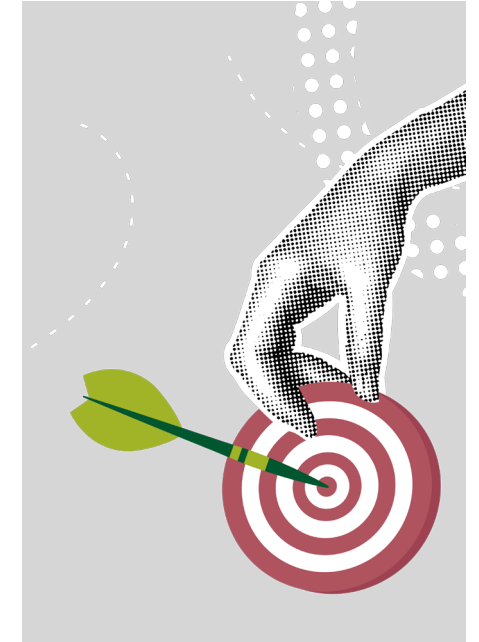
- **PMs act proactively** prevent problems and **then reactively** to solve the most complex problems them as they arise.
- The **10+1 Framework** provides structure and adaptability in complex conditions.
- **Effective problem-solving** is not merely reactive but, applying strategic leadership skills that sustains the projects through to successful outcome by all standards.



Final Words in Managing Project Outcomes

Project Managers in Education CIP Leadership

- Educational CIP PMs are uniquely positioned to shape the future of learning environments.
- Success comes from anticipating complexity, leading with clarity, and solving with purpose.
- Understanding Problem Complexity without Avoidance.
- Complex Problem Solving is an opportunity to enlarge success through creativity, enlightened management and finding solutions that were never considered before.
- Every project is a chance to build not just facilities, but better futures for students and communities.



“You’re not just building schools. You’re building opportunities.”



References

Project Managers Managing Complex Problems

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AIA Contract Documents (Program Manager role definitions)
Project Management Institute (PMI)

[General Project Management](#)

2. K-12 School District and Education Capital Planning

[Facilities Manager](#) ,

[10 Steps to Lead an Education Facility Capital Construction Project to Success](#), K.J. Jacobs

3. Emerging Technologies in Educational CIP Management

Gen-AI and Cognitive Project Management in AI (PMI resources link)