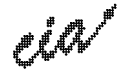


Report on the 3/13/03 Pikes Peak Chapter of PMI Presentation on Project Management Dynamics Root Causes of Project Failures, Stories of “Fixes that Fail”



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Project Management Dynamics, a 26 page paper with detailed explanations of the points covered in the presentation (and more) is available for purchase at: <http://www.exponentialimprovement.com>

What is systems thinking?
Seeking to understand system behavior by examining “the whole” ... instead of by analyzing the parts.

Program Announcement

In the February PMI, Pikes Peak Chapter, meeting, Rita Mulcahy noted the importance of root cause analysis of project problems. Our next meeting will address that topic.

Projects really do not work in a straight line of serial and parallel tasks started and completed (as portrayed by Gantt charts and PERT/CPM). Progress is actually accomplished iteratively.

Standard project management approaches do not cope well in dealing with

- the quality of the work done, where quality determines the amount of required “rework,” “rework discovery time” effects that determine the dormant “undiscovered rework” that eventually becomes actual required “rework” and also propagates errors into other project tasks, or
- the “side-effects” of overtime, rapid hiring, and the competing pressures of schedule, scope, cost and quality that impact intangibles like morale and fatigue.

Projects aren't problems to be solved; they are “messes” of interdependent problems. For problems, root causes are independent and separable; we can divide and conquer. But with messes, root causes are interdependent feedback processes that limit successful project completion or, worse yet, lead to project death spirals. For systems messes, we must seek to understand behavior by examining the whole, instead of by analyzing the parts.

In the 13 Mar 03 PMI meeting, we'll review the feedback structures and human characteristics that cause projects to fail. As a quick research project, we'll use proportional voting to distribute votes among the candidate root causes and determine this expert group's ranking of the causes. We'll then show how to use a “strategy matrix” to move from causal loops and driving forces to coordinated action to improve project performance using standard project management approaches.

Pre-meeting Request: It is requested that the membership please send a list of your top 5 candidates for the primary root causes of project failures to “**Bob Powell**” <scuba@usa.net>. He'll use your results in his presentation, “Project Management Dynamics” and the root causes of project failures.

Pre-meeting Responses

Pre-meeting responses are shown in [Table I](#). Observations:

- It should be no great surprise that “Lack of project management methodology” was suggested most often.
- “Lack of resources” and “Excessive schedule pressure” may be considered two sides of the same coin; either leads to too much work to be done in less time than available.
- While the words, “inside view,” were not suggested, they're added them to “Poor risk management (inside

view)” to relate this suggestion to influence #1 reviewed in the presentation.

- The pre-meeting suggestions “Poor business processes” and “Not in support of company value proposition” were very helpful. Prior to the meeting I had not considered these factors. While they fall outside the scope of what might generally be thought of as project management, they are extremely important and could be included under the umbrella, “the operation was a success, but the patient died.” They were widely viewed as important as the group ranked them highly, #4 and #9, respectively (see Table II).
- Two suggested root causes were not included in the first part of Table I.
 - ♦ “Lack of management support” suggestions were insufficiently specific. It could mean lack of support for project management methodologies, providing insufficient resources, poor business processes or any of a number of issues.
 - ♦ “Budget overruns” is a symptom, not a cause.

Mentions	Root Causes
7	Lack of project management methodology
5	Poorly defined scope
5	Lack of resources
3	Poor requirements specification
3	Excessive schedule pressure
2	Poor risk management (inside view)
2	Not in support of company value proposition
2	Poor business processes
1	Inadequate skills

Mentions	Root Causes
8	Lack of management support
1	Budget overruns

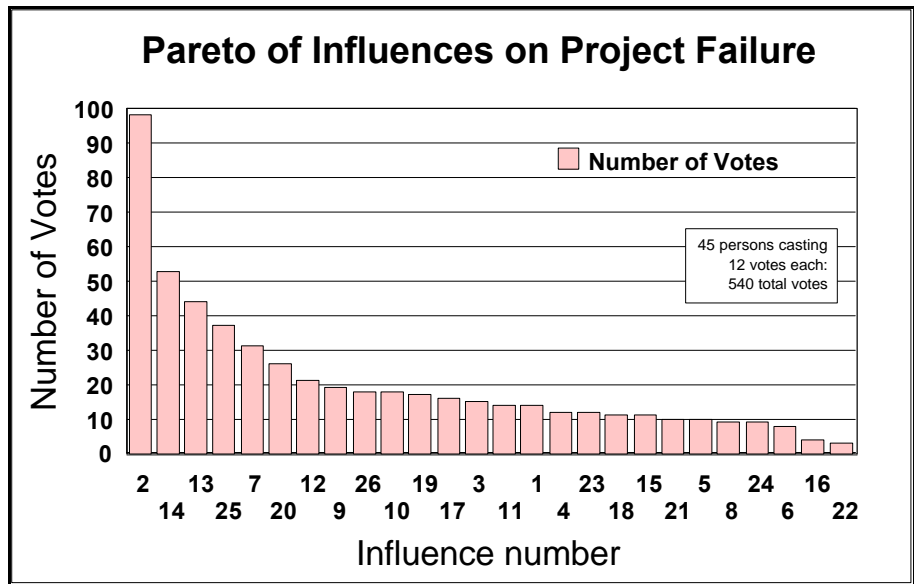
Summary Observations and Notes

Forty five (45) persons cast votes using proportional voting, distributing 12 votes each (540 total votes) among the 26 influences reviewed. Figure 1 shows the Pareto of the votes for the influences, with the top 10 ranked influences just below. Table II contains a full listing of the influences and number of votes.

Comments on the results:

- There was insufficient time to give more than a brief explanation of each influence.
- There was insufficient time for the group to engage in either
 - ♦ **inquiry**: participants ask for explanations of the influences about which they are uncertain, or
 - ♦ **advocacy**: participants have an opportunity to advocate for the barriers they think are most important.
- Time for **inquiry** and **advocacy** generate shared understanding and can change votes. When this process is used in workshops in a specific organization, time is allotted for:
 - ♦ inquiry and advocacy
 - ♦ developing action plans to address the top-ranked influences and root cause feedback loops.
- The results included here are from participants who work in multiple organizations, rather than from one organization (which would likely produce a very different, organization-specific ranking).
- In an economic downturn, it’s not surprising that “too rapid staffing” was ranked near the bottom.
- The 7 top-ranked barriers contained more than half the total votes (289/540).
- Figure 2 shows the

Figure 1. Pareto showing the ranking of the influences resulting in project failures



Rank	#	The 10 Top-ranked Influences. (The top 6 have > ½ the votes.)	Votes
1	2	poor scope definition	98
2	14	lack of proj mgmt discipline	53
3	13	fire fighting	44
4	25	poor business processes	37
5	7	incomplete specs	31
6	20	poor change control	26
7	12	inadequate systems thinking	21
8	9	too little use of the wheel of learning (to overcome multiple personality disorder)	19
9	26	not in support of company value proposition	18
10	10	defensive routines	18

distribution of responses at this PMI meeting as to the percentage of reality people believe they create. Figure 3 shows the distribution of all PMI responses from the 11/22/98 and 3/13/03 meetings. Figure 4 shows the distribution of all responses to date, including responses from this session.

Root Causes of Project Failures

The session reviewed the feedback loops that are root cause of project failure and the influences that affect the feedback loops.

Below is a summary of the loops in the model in Figure 5:

- **B1, Schedule Regulation with Overtime**, is the basic regulating mechanism that project managers use to stay on schedule; it's a balancing loop, the "fix."

This basic fix has "side effects," reinforcing loops, which activate other balancing loops, which in turn have additional side-effects. The structure is a combination of "fixes that fail," a systems thinking archetype.¹

- **R2a,b, Burnout Effect on Productivity**: "overtime" can increase "fatigue" and decrease "morale" to cause "burnout" to decrease "productivity" and increase the "work remaining."
- **R3, OT Costs**: "overtime" increases "cost pressure," which increases the "schedule pressure" that led to the "overtime" in the first place.
- **R4a,b, Burnout Creates Errors**: as more "overtime" increases "burnout," it decreases "quality" and increases rework to increase the "work remaining," leading to even more "schedule pressure" & "overtime."
- **R4c,d, Burnout Quality Pressure Affects Productivity**: lower "quality" increases "quality pressure" and decreases "productivity" to also increase the work "remaining."
- **B5, Quality Regulation**: a response to changing "quality." For example, if

Figure 2. Distribution of beliefs about creating reality from PMI meeting 3/13/03

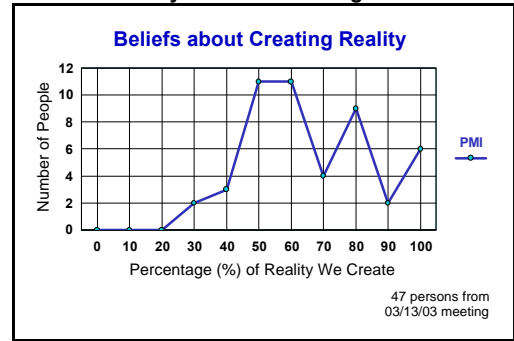


Figure 3. Distribution of all PMI responses of beliefs about creating reality

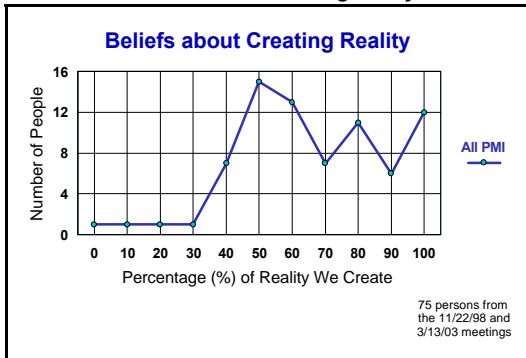
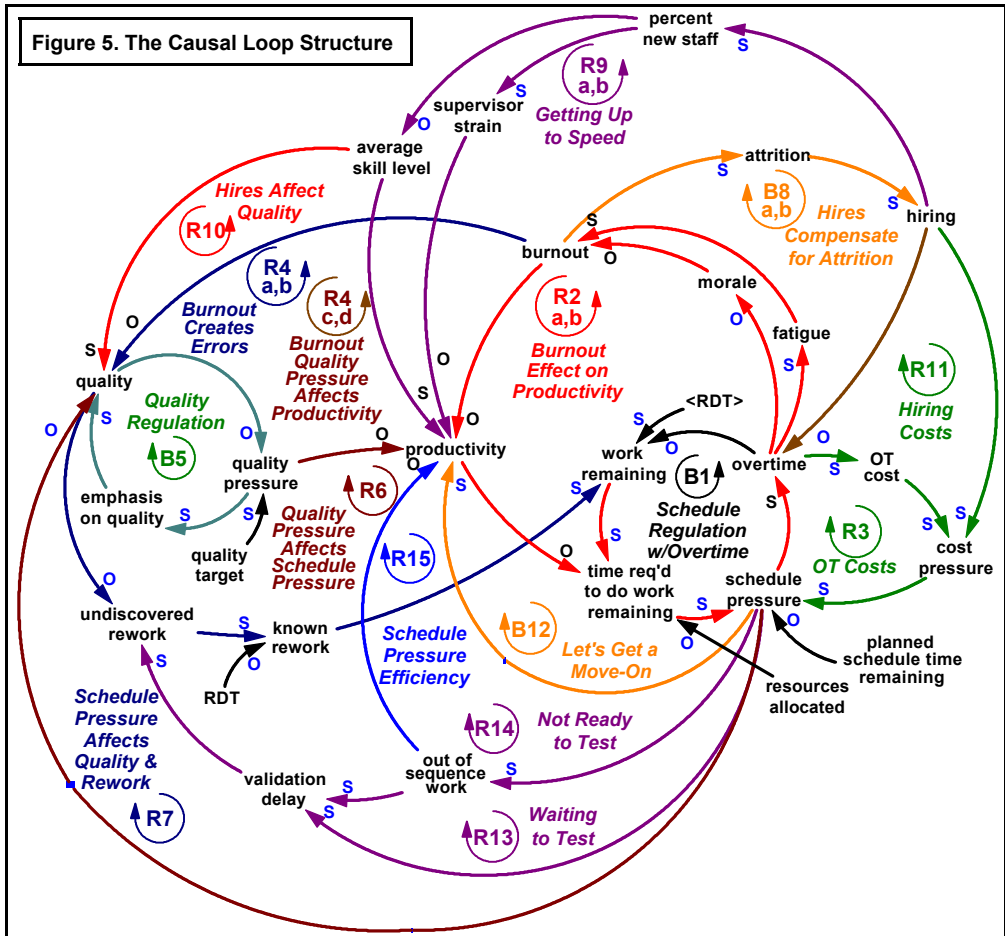
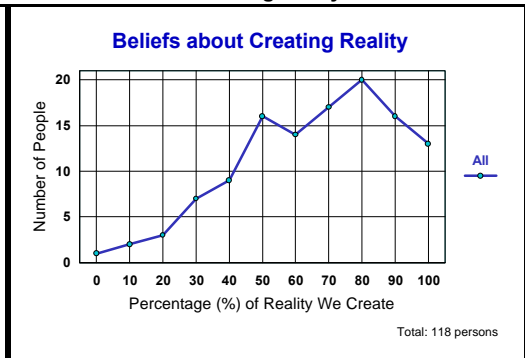


Figure 4. Distribution of all responses of beliefs about creating reality as of 3/13/03



¹ For more on the systems thinking archetypes, see Peter M. Senge, *The Fifth Discipline*, 1990

“quality” gets low compared to the “quality target”, this increases “quality pressure” and increases “emphasis on quality,” thus adjusting “quality” toward target.

- **R6, Quality Pressure Affects Schedule Pressure:** a decrease in “quality” increases “quality pressure” that takes time from production to increase “work remaining” and “schedule pressure”; this leads to a further reduction in “quality”.
- **R7, Schedule Pressure Affects Quality & Rework:** a decrease in “quality” also increases rework, which adds to “schedule pressure”; this also leads to a further reduction in “quality”.
- **B8a,b, Hires Compensate for Attrition:** four reinforcing loops that counter the ability to use “hiring” to compensate for the effects of morale and fatigue on “burnout”.
- **R9a,b, Getting Up to Speed:** “new staff” increases supervisor strain” and decreases “average skill level”. These influences decrease “productivity” and lead to more “overtime”, burnout and the need for even more “hiring”.
- **R10, Hires Affect Quality:** lower “average skill level” also reduces “productivity”.
- **R11, Hiring Costs:** while the purpose of “hiring” is to decrease “overtime”, it also “increases “cost pressure” and “schedule pressure” ... increasing the need for “overtime” to complete the project.
- **B12, Let’s Get a Move-On:** “schedule pressure” increases “productivity”.
- **R13, Waiting to Test:** increased “schedule pressure” increases the “validation delay”, leading to more “rework” and “schedule pressure”.
- **R14, Not Ready to Test:** more “out of sequence work” tends to cause people to delay checking their work and has the same effect as **R13**.
- **R15, Schedule Pressure Efficiency:** increased “out of sequence work,” decreases “productivity”.

High Level Effects

Figure 6 shows the high-level feedback recommended by the creators of the “Balanced Scorecard”.² “Financial Performance” is created by providing “Customer Value.” Business processes are necessary to “Serve Customers” and provide “Customer Value”. And the business processes are supported by skills, capabilities and motivation. Creating a “strategic budget” by taking a portion of the financial returns and investing in processes and capabilities creates a feedback loop. Figure 7 shows influences, “Poor business processes” and “Not in support of company value proposition”, that negatively affect this important feedback process.

The Influences on Project Success & Failure and Participant Ranking

Table II shows the complete list of influences in the rank order derived from proportional voting by meeting attendees .³ Figure 8 shows a simplified causal diagram (to reduce clutter) with the influences that negatively influence the structure and promote project failure. Each participant spread 12 votes among the 26 influences.

This is the kind of ranking that would be done in a specific organization, but one would of course not expect to see exactly the same ranking. Organization-specific ranking of these factors would be considered in determining improvement initiative focus.

Figure 6. Creating Feedback for Strategic Focus

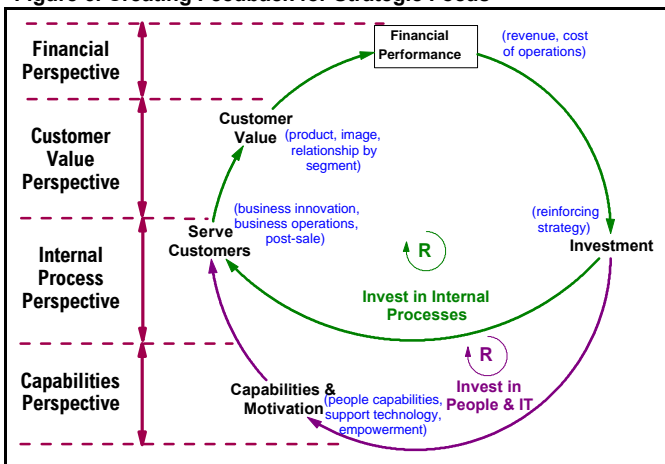
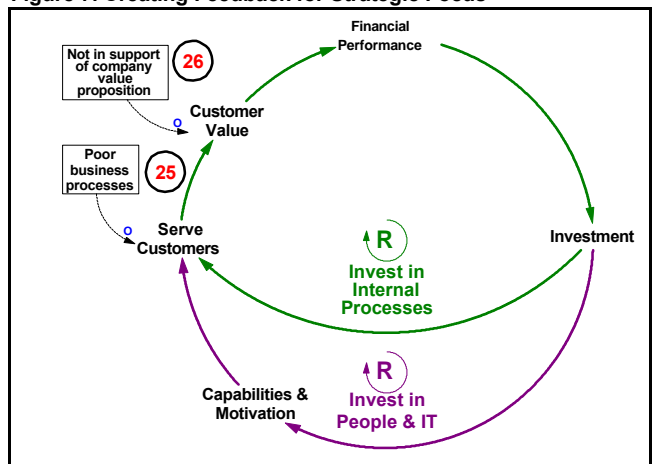


Figure 7. Creating Feedback for Strategic Focus



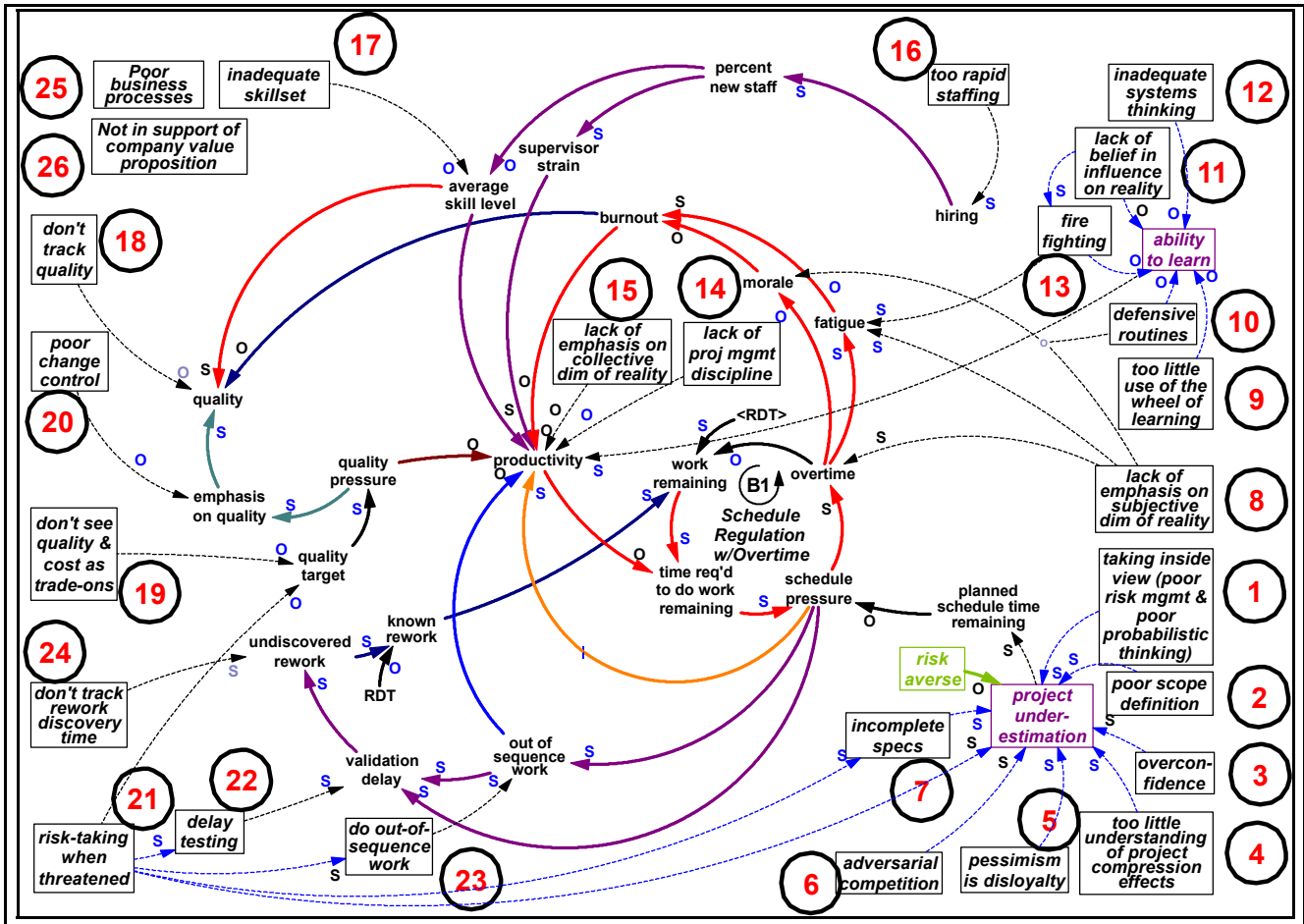
² This feedback is described, but not shown, in Kaplan & Norton, *The Strategy-Focused Organization*, 2001. For more on this, see [Create Strategic Focus](http://www.exponentialimprovement.com) at <http://www.exponentialimprovement.com>. Note: The Balanced Scorecard labels the lowest perspective as the “Learning and Growth Perspective.” Here it is labeled as the “Capabilities Perspective” because the entire feedback structure is about “learning and growth”.

³ Note: The handouts at the PMI meeting incorrectly reversed the numbers on “Poor business processes” and “Not in support of company value proposition”. The influences on the voting sheet were correct. Figure 8 is corrected, #25 & #26 are reversed.

Table II. Influences that promote project failures in rank order. (45 respondents, 12 votes each)

Rank	#	Influences	Votes
1	2	poor scope definition	98
2	14	lack of proj mgmt discipline	53
3	13	fire fighting	44
4	25	poor business processes	37
5	7	incomplete specs	31
6	20	poor change control	26
7	12	inadequate systems thinking	21
8	9	too little use of the wheel of learning (to overcome multiple personality disorder)	19
9	26	not in support of company value proposition	18
10	10	defensive routines	18
11	19	don't see quality & cost as trade-ons	17
12	17	inadequate skillset	16
13	3	overconfidence	15
14	11	lack of belief in influence on reality	14
15	1	taking inside view (poor risk mgmt & poor probabilistic thinking)	14
16	4	too little understanding of project compression effects	12
17	23	do out-of- sequence work	12
18	18	don't track quality	11
19	15	lack of emphasis on collective dim of reality	11
20	21	risk-taking when threatened	10
21	5	pessimism is disloyalty	10
22	8	lack of emphasis on subjective dim of reality	9
23	24	don't track rework discovery time	9
24	6	adversarial competition	8
25	16	too rapid staffing	4
26	22	delayed testing	3

Figure 8. The influences and how they affect variables in the model



Going from Influences to Feedback Loops (Root Causes)

Table III shows the total number of votes that influence the variables around each of the feedback loops. While organizations could simply rank influences and work on the top-ranked influences, this really isn't sufficient. Like a bicycle chain, a feedback loop doesn't "move" unless all of the links move. For action to be effective, actions must be taken around an entire loop.

This kind of loop ranking provides one measure of the perceived importance of the loops that organizations can consider in using proportional voting to determine final priorities ... that is, to decide on which loops are most important to nurture for improving performance. This is an organic approach for improving performance (see Figure 10).

Going from Causal Loops to Action

Understanding the structure of projects allows us to develop policies and measures to avoid project death spirals. Figure 9 shows how to do this in a coordinated way.⁴

Each group or individual involved with each loop defines their strategy for improving its operation. And each group defines a summary strategy for all loops in which it is involved.

In addition, "loop leaders" (i.e., project managers) can summarize loop strategies, that is, how all groups involved with a loop will foster its operation.

More specifically, we have a well-defined project when all groups and individuals define "who's going to do what, by when, with what level of quality" for each box in the matrix. This engages the necessary groups and individuals in improving system performance and it provides a detailed action plan for improvement.

At this point an organization can use standard project management techniques.

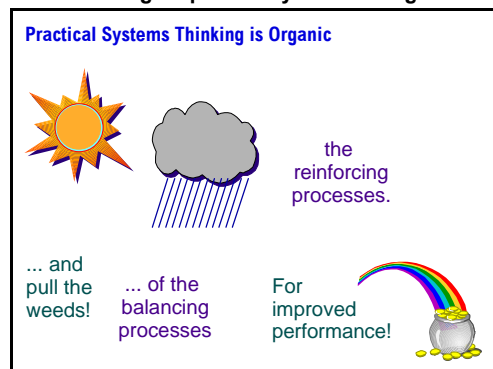
Figure 9. An Example Strategy Matrix

Strategy Matrix: Functions vs. Key Success Loops & Driving Forces						
Group or Individual	Key Success Loops & Driving Forces					Summary of Strategy for each Function
	Loop R2b Morale Effect on Quality & Rework	Loop R3a Fatigue Effect on Productivity	Loop R14 Hiring Effect on Quality of Work	Loop XX	Driving Force YY	
General Manager						
QA						
Engineering						
Human Resources						
Other						
Summary of Strategy for Each Loop or Driving Force						

... adapted from Clayton Christensen, "Making Strategy: Learning by Doing," Harvard Business Review, Nov/Dec 1997

Table III. Feedback loops in rank order.		
Rank	Feedback Loop	Votes
1	R10, Hires Affect Quality	559
2	R9a,b, Getting Up to Speed	521
3	R4c,d, Burnout Quality Pressure Affects Productivity	497
4	R2a,b, Burnout Effect on Productivity	468
5	R6, Quality Pressure Affects Schedule Pressure	406
6	R15, Schedule Pressure Efficiency	390
7	B12, Let's Get a Move-On	378
8	R11, Hiring Costs	325
9	R4a,b, Burnout Creates Errors	308
10	R14, Not Ready to Test	253
11	R13, Waiting to Test	241
12	R7, Schedule Pressure Affects Quality & Rework	217
13	B1, Schedule Regulation with Overtime	206
14	R3, OT Costs	188
15	B8a & b, Hires Compensate for Attrition	137
16	B5, Quality Regulation	64

Figure 10. For increased performance, feed and water the reinforcing loops to nurture the desired behaviors ... and pull the weeds for the balancing loops so they don't limit growth.



⁴ Adapted from Clayton Christensen, "Making Strategy: Learning by Doing," Harvard Business Review, Nov/Dec 1997. His approach describes how organizations can respond to external driving forces. We extend this to take into account feedback loops, which are "internal driving forces".

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Participant Feedback from the 3/13/03 Pikes Peak PMI Chapter Presentation on Project Management Dynamics

Root Causes of Project Failures, Stories of “Fixes that Fail”

What did you find most interesting?

- The cartoons - on the point and entertaining
- All of it
- Cartoons! The representation of the loops/cycles
- Love the cartoons — very appropriate. Lot to cover in a short amt of time. Bob did a fantastic job! Really enjoyed it.
- The section on how we believe control over our reality
- Anecdotes & cartoons
- Pictorial of feedback loops = it makes so much sense when you can see it
- Discussion about reality
- Kept the content interesting with applicable stories, examples and cartoons
- Following how causal loops impact other events that impact other events ...
- Cause and effect analysis. Topic - good & entertaining comic relief slides
- Process diagram views of problems
- Cartoons were on-point. Created “ah ha” moments
- Causal loops. Intriguing model.
- The entire integrated concept/presentation
- The entire presentation was interesting. Gives a very different way of thinking and guarding against the problems.
- Jokes that hit it on the head.
- Good points/ideas
- Psychological aspect / looking at factors of failure
- Feedback loop relations
- The Far Side cartoons - that relate to reality in project management
- Entirety
- The human interaction, emotions involved in project success/failure
- The analytical processes are more than imagined
- Humor infused in a tough subject
- “Systems Thinking” examples
- The systems approach. Like system theory. Feedback loops are critical
- Very thought intensive ... learned a lot
- Causes identified are right on target. Participation by audience ahead of presentation. Good humor.
- The loop structure
- All of it ... Concepts of causal loops and feedback, and root causes discussion.
- Use of cartoons to explain complex ideas
- The charts and concepts
- I love how complex the system is.

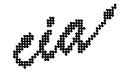
What would you change?

- Charts too busy - handouts earlier
- Just needed more time
- Wish there was more time / but all and all — GREAT!
- Explain your codes on diagrams a little more; add some construction and/or other development besides IT/IS metaphors/examples
- I wish we could have had more time to cover material
- Minimize complexity
- Complexity
- Pretty complex for 1 hour
- Too much info for one hour!
- Need to change focus to easy to absorb knowledge
- Simplify presentation to fit time frame
- Nothing!!
- Nothing
- I got lost
- Shorten it and make it less complex - focus on a few key ideas
- Needs more time
- Nothing
- Wish we had more time to discuss more
- More time to explain some complex charts, etc.
- Need more time for delivery/reception
- Add 12 hours
- Nothing ...
- Not quite so much theoretical detail
- Don't present unless you have sufficient time ...
- Too much material for only one hour
- Handout of the articles and book references (and how can I get a copy?) — perhaps more focused to allow more indepth discussion of some of the selected topics
- Too complicated for an evening session
- More time, ha! ha!
- How to discuss in an hour. Handouts would help to follow along.

Other Comments

- The base concepts might be presented in a simpler fashion
- Thank you for sharing this material
- Very interesting. Would like more time to study.
- Lots to take in
- Too compressed
- Thank you!
- Enjoyable
- Want to know more
- Overall, excellent presentation and hit a home run on causes of project failures.
- Very complex, very provocative
- A bit too detailed
- One of the best presentations
- Good cartoons in presentation
- Very interesting! Thank you.

Overview of Continuous Improvement Associates Workshops



Facilitating Group Action

A facilitation workshop teaches groups how to overcome “group multiple personality disorder.” Groups become more efficient, effective, and adaptable. This workshop is for groups that

- ◆ are frustrated by meetings that drag on and on with few decisions,
- ◆ have issues that are often revisited without resolution,
- ◆ spend too much time on relatively unimportant details, and
- ◆ eventually take action without a true consensus.

Insanity in individuals is something rare – but in groups, parties, nations and epochs, it is the rule.

Friedrich Nietzsche (1844 - 1900)

The foundation of this facilitation approach is the Wheel of Learning, the feedback process at the heart of all learning.

Groups learn ground rules that promote double-loop learning (examining mental models and changing decision rules and strategy to make better decisions with even the same information used in single-loop learning). They help groups learn how to address the “real issues” by practicing in a safe environment where the use of the more productive norms of behavior are monitored and encouraged.

Groups learn this facilitation technique by practicing in the context of a real problem. Workshops can be defined around a process an organization wants to improve where there is hard data (such as production or engineering processes), or around an issue about which the group determines the “correct” answer (such as group values, purpose, vision or goals).

The skills learned in this workshop are a necessary ingredient for:

- ◆ creating exponential process improvement.
- ◆ developing a winning strategic focus.

Exponential Improvement

An exponential improvement workshop moves teams from firefighting to long-term improvement. Teams learn to make the invisible, visible; that is, they the problems they prevent are made visible.

Exponential improvement enables organizations to realistically achieve consensus on improvement targets:

- ◆ how much improvement to expect
- ◆ how long it will take to make them (half-life estimates).

The major barrier to improvement:

We've never learned to reward people for the disasters that never happened ... that is, the disasters they prevented!

Bob Powell, 1994

And it provides methods to

- ◆ track that improvements are on target (half-life plots).
- ◆ reward teams for disaster prevention, rather than for disaster recovery.

Exponential improvement saves time, dollars, and even lives. It helps keep organizations out of crisis. Staying out of crisis is the only decent way to live.

Create Strategic Focus

A strategic focus workshop develops

- ◆ an explicit strategy for growth and
- ◆ defines measures to track the effectiveness of the strategy.

Adapt or Create?

Following a “machine” paradigm, we work to adapt to a future we try to predict in response to an environment we don't control.

Based on a “systems” paradigm, we work to design a desirable future and invent ways to bring it about.

Based on systems thinking principles, in this workshop groups achieve consensus on what to do and on what to measure. The systems thinking archetype, the Attractiveness Principle, the structure that explains the “no organization can be all things to all people” dynamic. It then examines the links in the value chain that provide the desired customer value and how to improve them.

This workshop provides much-needed time to stand back and focus on strategies for improving organizational performance. They shift from explaining the past to learning about the future in a creative process that develops momentum for organizational change.

Problems vs. Messes

Projects are not composed of independent and separable problems to be solved.

Projects are messes. That is, they are composed of multiple interdependent problems that cannot be divided and conquered.

Systems thinking approaches the challenge organically. We develop policies to feed and water the feedback loops in a way that fosters the outcomes we desire.

Project Management Dynamics

A project management workshop

- ◆ examines the influences and structures (root causes) that determine project success or failure,
- ◆ develops group consensus on which are most important *for the group* in limiting project success, and
- ◆ develops action plans to address them, for which standard project management techniques can be used.

A Brief Summary of Additional Continuous Improvement Associates Workshops

- **Overcoming Barriers to Quality Improvement** - examine the structures that cause improvement initiatives to fail, develop consensus on the top barriers, and develop action plans to address them.
- **Systems Thinking Leadership** - design and nurture the feedback processes (as defined by causal loops) and information systems that determine organizational performance (this is defining action plans that foster beneficial action of the causal loops that affect organizational performance) ... it's the approach we take in a garden: for reinforcing processes we provide sun, water and fertilizer, and for balancing processes we pull the weeds.
- **Systems Thinking Archetypes** - examine commonly-observed structures that affect organizational behavior, discover instances where they are operating within the organization, and develop action plans for improvement.
- **From Reactive to Preventive Maintenance** - examine the structure that leads to ever-increasing production downtime and maintenance costs.
- **Service Quality Erosion** - learn how to avoid the dynamic where entire industries get locked into vicious cycles of eroding service standards due to eroding goals and "false learning."
- **The Engines of Growth** - develop consensus on the organization's reinforcing feedbacks for growth and develop action plans to promote them.
- **Organizational Evolution** - learn the successive revolutions for which organizations must be prepared in order to maintain growth, identify the organization's evolutionary level, and develop action plans to get to the next level.
- **Escaping the Crisis Syndrome** - examine different approaches for moving from excessive reliance on the "quick fix" to an emphasis on long-term improvement, select approaches that are best suited to the organization, and prepare for the "worse before better" behaviors that will be experienced on taking actions that produce long run benefits.
- **Defensive Routines** - learn and practice norms and ground rules for effective communication to avoid a downward spiral of organizational dysfunction.
- **The Process Improvement Trap** - examine the structure of improvement initiatives and learn how to overcome a debilitating psychological barrier: when organizations "know" that people are the problem, they find that this belief is a self-confirming attribution that leads to a vicious cycle of declining organizational performance.
- **The Product Life Cycle and the Diffusion of Innovation** - reach a shared understanding of the sources of attractiveness, the competition, technical innovation, changing criteria of use and other factors that influence the adoption, growth and decline of products and services to create action plans to meet future challenges and understand, monitor and foster innovation.
- **Creating Reality Consciously** - learn how the feedback of self-confirming attributions & self-fulfilling prophecies create reality for individuals and organizations, and examine how Values & "Concept" guide creating the future and escaping "reality traps."
- **Promotion Chain Dynamics** - understand the structure that causes organizations to get "top heavy" and develop policies to address the problem; in addition, examine the surprisingly powerful effects of high turnover on organizational capability.