

Survey Results - ASQ Presentation - 11/13/02

Systems Thinking and Barriers to Quality Improvement



The Session

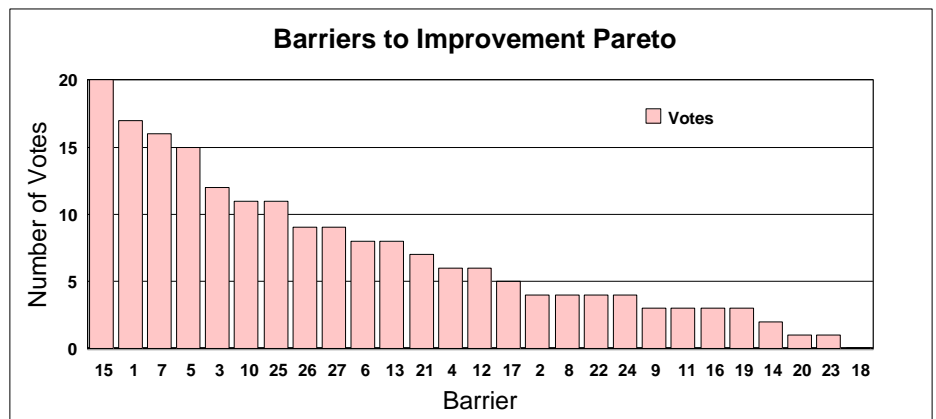
The session reviewed the barriers to long-term quality improvement based on the systems structures described in the referenced papers (see next page). Structures on which the barriers are based are shown on pages following the Pareto ranking of the barriers.

Notes and Observations on the Results

Each of sixteen ASQ participants used proportional voting to distribute 12 votes among the 27 barriers reviewed. A Pareto of the barriers is shown below (barrier # is arbitrary). The next section includes a full listing of the barriers.

Comments on the results:

- There was insufficient time to give more than a brief explanation of each barrier.
- There was insufficient time for the group to engage in either inquiry, where participants ask for explanations of the barriers about which they are uncertain, or advocacy, where participants have an opportunity to advocate for the barriers they think are most important. Inquiry and advocacy contribute greatly to increasing shared understanding and can change votes. In workshops in organizations, time is allotted for inquiry and advocacy, as well as for developing action plans to address the top-ranked barriers.



- The 5 top-ranked barriers all relate to the tendency to take action based on short-term considerations.
- It may be better to combine barriers #26 and #27. “Excessive reward & recognition for firefighting” and “Inadequate reward & recognition for problem prevention” could be considered two sides of the same coin. If the votes were combined, the combination would have ranked 2nd in importance.
- The results are from participants who work in multiple organizations, rather than from one organization (which might produce a different, or a tighter, ranking of the top barriers).
- The 6 top-ranked barriers contained almost half of the total votes (91/192).

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

Top Barriers to Quality Improvement Progress

Rank	Barrier		Additional Description	Votes
	#	Description		
1	15	Inadequate training & support capacity due to management allocation	Management doesn't allocate sufficient resources	20
2	1	Excess pressure from Wall Street	Creates a short-term orientation that does not foster process improvement	17
3	7	Excess emphasis on reactive, rather than on preventive maintenance	Management not allowing “takedowns” for preventive maintenance increases collateral damage from “breakdowns”	16
4	5	Ad hoc changes to processes	Excessive management pressure on production results in ad hoc changes that introduce new problems	15
5	3	Excess focus on correcting defects	Excess focus on correcting defects, rather than on working smarter, reduces effort allocated to improvement programs	12
6	10	High organizational complexity	Long half-life makes improvement more difficult	11
7	25	Job insecurity due to fear of blame	Improvement commitment is low due to fear of being blamed for problems found & reported	11

Rank	Barrier		Additional Description	Votes
	#	Description		
8	26	Excessive reward & recognition for firefighting	Improvement commitment is low due to excessive reward & recognition for firefighting	9
9	27	Inadequate reward & recognition for problem prevention	Improvement commitment is low due to inadequate reward & recognition for problem prevention	9
10	6	Attribution that people are the problem	Management attribution that people are the problem creates a self-confirming attribution	8
11	13	Excessive scope of initiatives	Management sets improvement initiative scope too broadly, which limits improvement effort effectiveness	8
12	21	Job insecurity: fear of layoffs from improvement efficiency gains	Improvement commitment is low due to fear of layoffs from improvements reducing personnel requirements	7
13	4	Excess focus on throughput; working harder, not smarter	Excess focus on working harder, rather than on working smarter, reduces effort allocated to improvement programs	6
14	12	High complexity makes TQM tools less appropriate & effective	High organizational & technical complexity limits effectiveness of TQM-like improvement approaches (with independent & separable causes)	6
15	17	Improvement results not well-communicated	Insufficient communication of improvement results to employees limits employee commitment	5
16	2	Insufficient engineering process improvement	Insufficient attention on engineering process improvement doesn't support "filling the factory" to increase job security	4
17	8	Stretch objectives set too low	Limits employee motivation to improve	4
18	22	Job insecurity: fear quality & productivity improvements won't maintain / increase market share	Improvement commitment is low due to fear of layoffs from improvements not maintaining / increasing market share	4
19	24	Job insecurity due to concern that economic growth is too low	Improvement commitment is low due to concern that economic growth is too low to maintain overall industry demand	4
20	9	Stretch objectives set too high	Discourages employees from trying to improve	3
21	11	High technical complexity	Long half-life makes improvement more difficult	3
22	16	Inadequate training & support capacity due to high employee demand	Employee demand is high due to high commitment to improvement programs	3
23	19	High rate of personnel turnover	Improvement results limited because of excessive decay of performance due to a high rate of personnel turnover	3
24	14	Benefits too diffuse	Improvement program benefits are too diffuse to seem worth it to individual groups (the "commons" problem)	2
25	20	High rate of technological change	Improvement results limited because improvements are made obsolete by a high rate of technological change	1
26	23	Job insecurity: fear new product development won't maintain / increase industry demand	Improvement commitment is low due to fear of layoffs from new product development improvements not maintaining / increasing industry demand	1
27	18	Improvements insufficiently embedded in physical capital	Improvement results limited because of excessive decay of performance due to improvements being insufficiently embedded in physical capital (with normal personnel turnover)	0

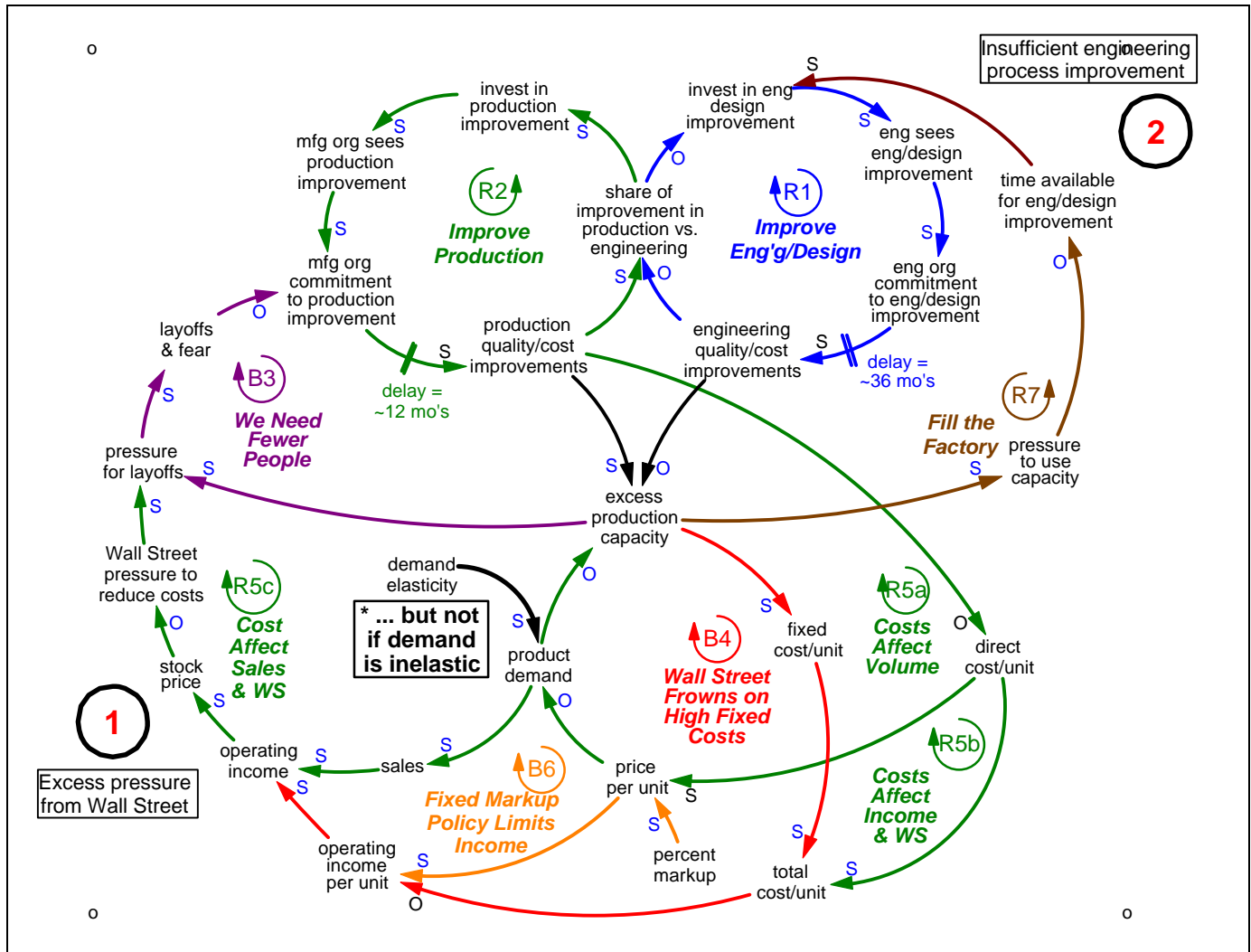
References

- Sterman, J., N. Repenning, and F. Kofman (1997), "Unanticipated Side Effects of Successful Quality Programs: Exploring a Paradox of Organizational Improvement," *Management Science*, 43, 4: 503-521.
- Repenning, N. and J. Sterman (2001), "Nobody Ever Gets Credit for Fixing Defects that Didn't Happen: Creating and Sustaining Process Improvement," *California Management Review*, 43, 4: 64-88.
- Repenning, N. and J. Sterman, (forthcoming), "Capability Traps and Self-Confirming Attribution Errors in the Dynamics of Process Improvement." Forthcoming in *Administrative Science Quarterly*. (2000).
- Getting Quality the Old Fashioned Way: Self-Confirming Attributions in the Dynamics of Process Improvement, Cole, R.B. and R. Scott (Eds.) *Improving Theory and Research on Quality Enhancement in Organizations*, Thousand Oaks, CA: Sage.
- Keating, E., R. Oliva, N. Repenning, S. Rockart and J. Sterman (1999), "Overcoming the Improvement Paradox," *European Management Journal*, 17, 12: 120-134.
- John Sterman, *Business Dynamics, Systems Thinking for a Complex World*, Irwin McGraw-Hill, 2000, pp. 66 - 79

Information about the book, *Business Dynamics*, and the downloadable journal articles are available on the web at: <http://web.mit.edu/nelsonr/www/> and <http://web.mit.edu/jsterman/www/>.

Barriers 1 & 2

Structure on "The Quality Improvement Paradox" from Sterman, J., N. Repenning, and F. Kofman (1997).
 "Unanticipated Side Effects of Successful Quality Programs: Exploring a Paradox of Organizational Improvement,"
Management Science, 43, 4: 503-521. <http://web.mit.edu/nelsonr/www/>



Presentation Feedback

What did you find most interesting?

- The segment on PM and reactive maintenance
- The relationships of applying resources to different business functions
- The theory itself
- How the connections fit together
- The impact on long-term continuous improvement
- Mixture of complex diagrams with cartoons
- Interrelationships and dependencies of actions
- All
- Nice presentation. A lot of information, but very organized.

What would you change?

- Presentation ran fairly fast but ...???... mentally just a little slower pace.

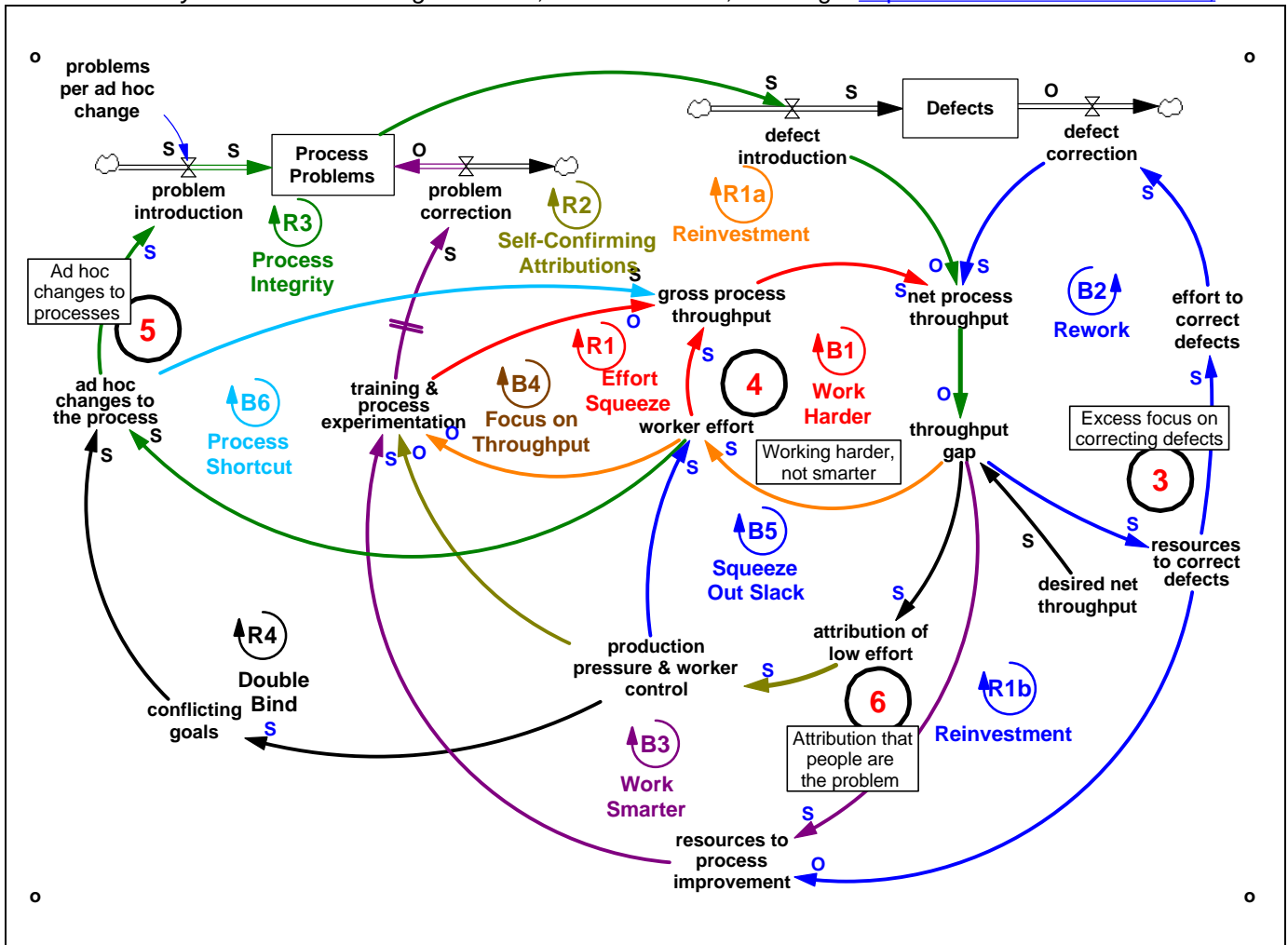
- Spend more time describing the different barriers
- Too much detail for too short a time, either shorten presentation or reduce content
- A bit less items
- Publish more info on topic so we can be better prepared for the quick presentation
- Need longer time
- Make the font bigger on the slides
- More time to discuss

Other Comments

- Thanks, very interesting and applicable
- Need larger screen or handout hard copies
- Great presentation
- Slow the pace down a bit
- Do you plan to make the pareto by barrier?

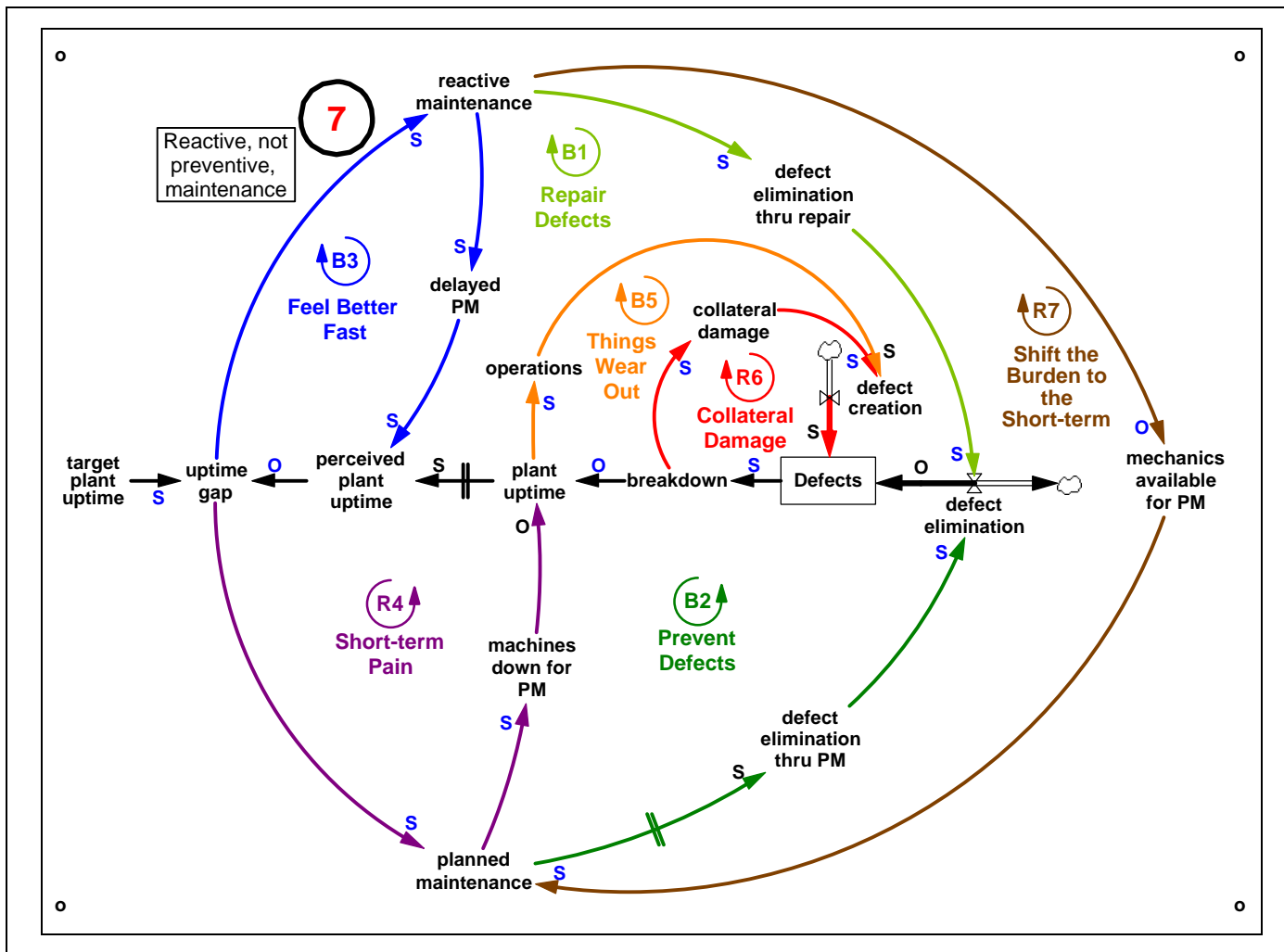
Barriers 4 - 6

From Repenning, N. and Sterman, J., Getting Quality the Old Fashioned Way: Self-Confirming Attributions in the Dynamics of Process Improvement, Cole, R.B. and R. Scott (Eds.) *Improving Theory and Research on Quality Enhancement in Organizations*, Thousand Oaks, CA: Sage. <http://web.mit.edu/nelsonr/www/>.



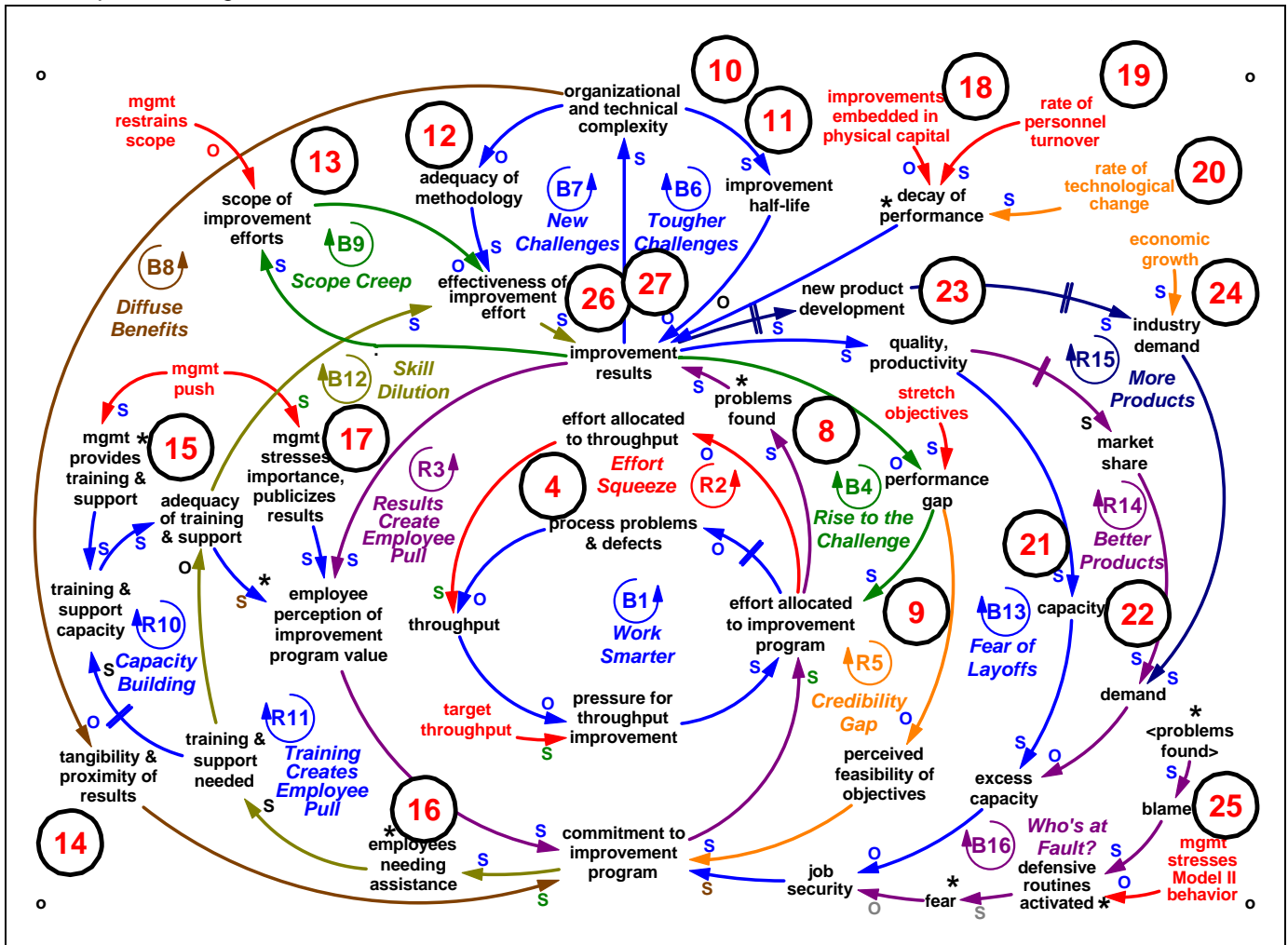
Barrier 7

On "Manufacturing Breakdown vs. Takedown" based on: John Sterman, *Business Dynamics, Systems Thinking for a Complex World*, Irwin McGraw-Hill, 2000, pp. 66 - 79. <http://web.mit.edu/jsterman/www/>



Barriers 8 - 27

On "Barriers to Long-Term Improvement" expanded from:
 Keating, E., R. Oliva, N. Repenning, S. Rockart and J. Sterman (1999). "Overcoming the Improvement Paradox,"
European Management Journal, 17, 12: 120-134. <http://web.mit.edu/nelsonr/www/> <http://web.mit.edu/jsterman/www/>



Barrier #	Barrier Description
8	Stretch objectives set too low
9	Stretch objectives set too high
10	High organizational complexity
11	High technical complexity
12	High complexity makes TQM tools less appropriate & effective
13	Excessive scope of initiatives
14	Benefits too diffuse
15	Inadequate training & support capacity due to management allocation
16	Inadequate training & support capacity due to high employee demand
17	Improvement results not well-communicated
18	Improvements insufficiently embedded in physical capital
19	High rate of personnel turnover
20	High rate of technological change
21	Job insecurity: fear of layoffs from improvement efficiency gains
22	Job insecurity: fear quality & productivity improvements won't maintain / increase market share
23	Job insecurity: fear new product development won't maintain / increase industry demand
24	Job insecurity due to concern that economic growth is too low
25	Job insecurity due to fear of blame
26	Excessive reward & recognition for firefighting
27	Inadequate reward & recognition for problem prevention

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

What is systems thinking?

Seeking to understand system behavior by examining “the whole” ... instead of by analyzing the parts.

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).

Insanity in individuals is something rare – but in groups, parties, nations and epochs, it is the rule.
Friedrich Nietzsche (1844 - 1900)

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. They learn to make the invisible, visible, that is the problems prevented are made visible.

Exponential improvement gives organizations a way to realistically achieve consensus on improvement targets: how much improvement to expect and how long it will take to make them (half-life estimates). And it provides a way to track that improvements are progressing as expected (half-life plots). It provides a method to reward teams for disaster prevention, rather than for disaster recovery. It can save time, dollars, and even lives.

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

Exponential improvement helps keep organizations out of crisis. Staying out of crisis is the only decent way to live.

Create Strategic Focus

In a strategy workshop organizations develop an explicit strategy for growth and measures to track how effective the strategy is. It is based on systems thinking principles that allows groups to achieve consensus on what to do and on what to measure. To achieve focus, the workshop draws on the systems thinking archetype, the Attractiveness Principle, the structure that explains the “no organization can be all things to all people” dynamic.

A workshop on strategy 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.

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.

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.
- **Project Management Dynamics** - examine the structures that determine project success or failure, develop consensus on which are most important in limiting project success, and develop action plans to address them.
- **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.