# *Concurrency* Newsletter

## *Announcements*

**Annual Conference: Mark your calendar for June 9 and 10, 2016; Linda Cummings**

**Webinar:  Collabrious, Growing enterprise value through collaborative innovation[SM] with over 400 in attendance November 19, 2015 (see summary below). February webinar in planning stage, by Kim Johnson**

**Feature Article: Concurrent Leadership for Success, by Frank Hull**

## Collabrious: **Growing enterprise value through collaborative innovation[SM]**

Two lifelong students of innovation, Clyde Hanson and David Quimby, shared a new analytical tool for those working to advance innovation. They found the highest-value innovations result from boundary-crossing collaboration. These innovations disrupt industries and measurably impact market share, profits and shareholder value.  They shared how to map social networks of patented inventors in your organization to identify collaboration trends and gaps.

Technical specialists typically produce incremental improvements that don't move the market.  The gold standard for inventor performance is real, patent-worthy innovations created within a diverse collaborative network. Data show that the highest-value inventors are those who collaborate across patent classifications and technical fields.
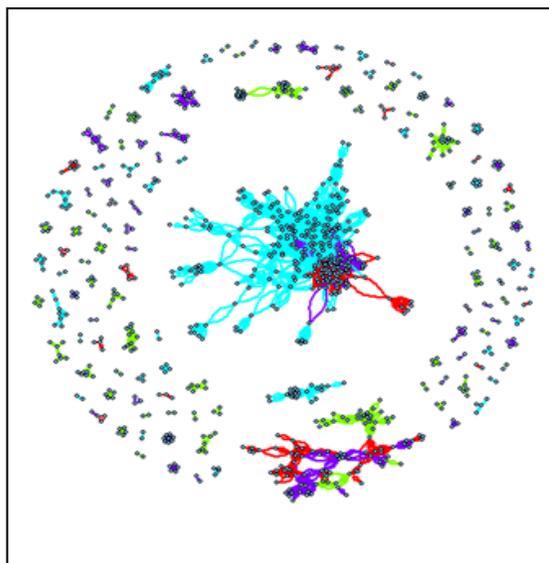


**Figure 1  -  Sample Collabrious Map: Co-inventor relationships, 941 inventors, 865 patents; 4 USPTO data storage technology classes (by color), Minnesota / 2008-2012.  Points are inventors, lines are relationships between inventors.**

The tool is called "Collabrious™" and it delivers actionable insights on both organizational and individual collaboration performance to executives in general management, technology and innovation management, R&D, engineering and human resources.

David Quimby is a software entrepreneur who holds two U.S. patents in the UX domain. He is an economist and systems analyst; he is also an expert in innovation management and organizational change

Clyde Hanson is an expert in patent valuation and analytics. He has diverse experience in commercialization / marketing of information tools and products.

## Concurrent Leadership for Success

Frank Hull

Books on leadership abound. Yet there are very few replicated findings about best leadership practices in the research literature. One reason is because so much attention has focused on CEOs such as Jack Welch and Alan Mulally (See Appendix A for illustrations of their accomplishments). Some kinds of decisions that can only be made at the top that are contingent on unique situations, such as buying or selling lines of business.  By contrast, policies set by CEOs are potentially decisions with persistent impacts. For example, when John Trani became CEO at The Stanley Works, he stated his innovation policy by saying "you cannot cost cut your way to greatness." Subsequently the CTO at Stanley, Will Hill, designed a system to outpace others in the industry in rapid innovation by strategically engaging teams of employees in product development.[1]

Developing innovative new products requires reiterative engagement in strategy formulation not only by top management, but also doers throughout the organization because the tasks are increasing complex and dynamic. According to Norton and Coffey (HBR, 2007), strategic engagement in innovation needs to be widely dispersed in a knowledge-based economy.

> Strategy is executed from the ranks.  Employees interact with customers and peers; senior executives do not. No longer is it the exclusive domain of the CEO, strategy is literally everyone's job. Yet despite the ample evidence of employees' pivotal role in strategy execution, 95% of workers typically do not understand their organization's strategy.  Employees are not informed about it, do not know their relation to it, and are not incented to find out.

In hundreds of interviews, this author has asked engineers about the basis on which they make trade-offs between time, cost, quality, and innovative features. The responses confirm the absence of strategic insight as almost all reported they just "do more or less what they did before." Seldom has anyone below a senior level been able to explain readily how the project on which they were working connected to the strategy of their business unit.

The thesis of this article is that leadership needs to be more widely exercised throughout large-scale organizations engaged in complex, dynamic product development operations. The challenge is: how do we grow leadership capabilities?  The dilemma for many managers is "how do I lead team members who know more than I do yet still guide their behaviors?" Increasingly the answer lies in distributed leadership whereby development projects are collaboratively led by the doers as well as their formal leader. Many team members need to share responsibility for leading their development project to successful execution instead of relying solely upon a solo decision-maker.

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[1] **Concurrency Newsletter,** Issue 2013, No 1,  http://www.scpdnet.org/

Often leadership practices touted in the myriad of books on the topic deal with the unique personally of specific people. Some say that leadership cannot be taught. Accordingly, some companies profile new recruits based on personality assessments and place them on a fast track. Of course personality can make a difference. But can good leadership practices really be that hard to exercise? Why can't effective organizations create an infrastructure enabling ordinary people to achieve extraordinary results?

### Concurrent Leadership Integrative Juggling

The logic behind concurrency is compelling. Most costs in product development are committed early in the development cycle where opportunities for innovation are greatest. But most of the money is expended later in the cycle as illustrated in the diagram below:
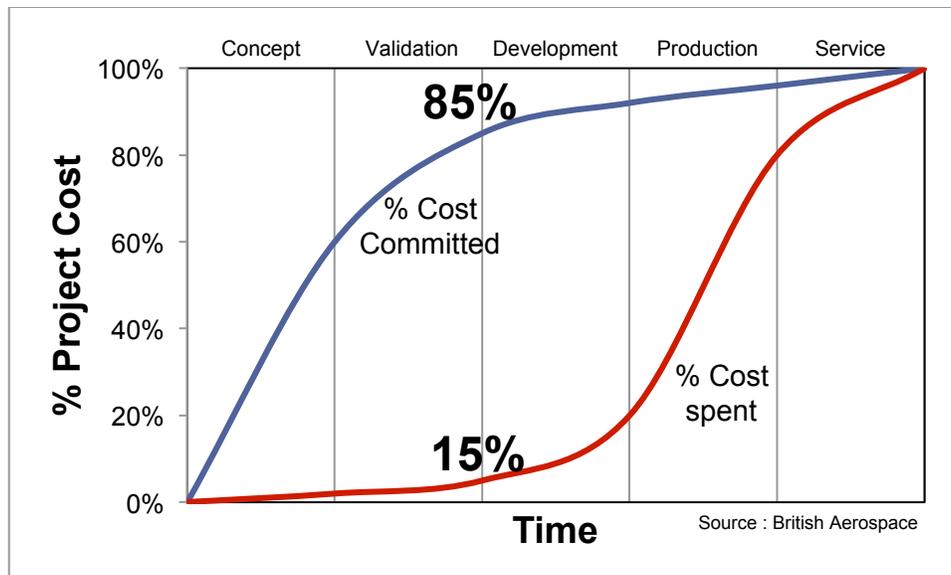


Because of this lack of overlap, enterprises often make two types of errors. First, many fail to field a multifunctional core team up-front which includes all stakeholders required not only for creating the product, but also realizing its delivery to customers. Second, the front end is often under-managed relative to the back end when expenditures rise. Unfortunately, the cattle are already out of the barn door, so to speak. And the cost of corralling errant strays rises exponentially over time. The cost of non-concurrency is huge because rework is far more expensive than pre-work.

### The Google List of 8 Top Leadership Practices

Google published a list of 8 leadership principles that were widely disseminated not only because of its corporate fame, but also because of their basic simplicity. An advantage of the list is that the actions focus on behavior without specific links to the personality of charismatic leaders. The Google principles seem to be fairly universal and within reach of employees who may not need to be superstars. Although the list is likely to apply more strongly to projects developing complex new products, the practices seem generally

applicable beyond the high-tech sector. The potential power of the list is that is helps foster "distributed" leadership.

### Google List of 8 Top Leadership Qualities

http://www.nytimes.com/2011/03/13/business/13hire.html?pagewanted=all&_r=0

1. *Be a good coach*
2. *Empower your team and don't micromanage*
3. *Express interest in your team members' success and well-being*
4. *Be productive and results-oriented*
5. *Be a good communicator and listen to your team*
6. *Help your employees with career development*
7. *Have a clear vision and strategy for the team*
8. Have technical skills so you can advise the team

*(Bold Italic items are analysed in the research reported below)*

### Toward a Model of Best Leadership Practices

The objective of this article is to develop a research-based model of best leadership practices. This article tests the extent to which following Google's list of basic principles enable people to achieve effectiveness as collaborative leaders. A key resource is analysis of a database of 5000 plus respondents from over 100 strategic business units in major corporations in a SPOT (Strategy, Process, Organization, Tools) databank.

The starting point for the analysis is a quasi-experimental study of changes in leadership behaviors. Three sites of a large global corporation simultaneously attempted to improve their product development systems, one in the US and two in Europe. A principal difference is that the US site additionally deployed a Leadership Development Initiative (LDI).

All three sites improved their product development systems with collateral benefits for leadership practices. However, the US site with the LDI initiative improved 10 specific practice more than the quasi control groups.

These 10 leadership practices represent an unusually good set of behaviors based on their correlations with performance in product development projects. Therefore, we explore ways in which they are like and unlike the Google principles. To the extent these practices illustrate Google principles, the utility of the Google's recommendation are partially validated.

The 10 practices shown in the Table below are grouped into three domains: Strategy, Process, and Organization. All 10 leadership practices are significantly correlated with project performance in the SPOT databank.

### Leadership Practices Improved at a US Experimental Site

| Strategy |
| --- |
| • Ensured everyone worked toward a common goal. |
| • Helped surmount rather than create obstacles for this project. |

| Process |
| --- |
| • Coached the team in the use of product development processes. |
| • Guided projects to keep them from wandering off track |

**Organization**

*a. Empowerment*
- Allowed the project team the autonomy they needed to complete their work.
- Kept out of the way when their help was not solicited.

*b. Humanistic Team Focus*
- Showed concern for the well-being of team members.
- Rewarded team members equally based on project performance.

*c. Instrumental Focus*
- Emphasized short-term, measurable achievements.
- Rewarded individuals for how competently they did their own job.

### Leadership Development Initiative (LDI)

All three sites in the global corporation assessed their product development practices using a common diagnostic. Efforts to close gaps vs. Best-in-Class practices were undertaken at each site. Multifunctional task forces were recruited at each location to focus on closing gaps five areas shown in the list below. However, three additional gaps shown in ***bold italic*** were added by the LDI steering committee at the US site.

### Areas for Improvement Targeted by Three Sites of a Global Corporation

- A. Early Life-Cycle Teaming
- B. ***Coaching Empowered Cross-Functional Teams***
- C. ***Voice of Customer***
- D. Innovation
- E. Strategy Engagement
- F. Process Improvement
- G. Agility of Value Creation Cycle
- H. ***Voice of Supplier***

The US site Leadership Development Initiative (LDI) has been ongoing for several years. For example, in 2011 various study teams compiled a booklet of their views on leadership by amalgamating readings and personal experiences. Beginning in late 2012, however, LDI undertook a more action oriented approach by focusing on closing specific measurable gaps in practices vs. BIC (Best-in-Class) standards.

1. A pilot group of 16 managers focused on closing four gaps vs. BIC in November 2012

2. In March 2013 the initiative was enlarged to over 200 managers. Managers were asked to volunteer to close gaps vs. Best-in-Class practices for the eight gaps listed above.

Managers selected their targets and were asked join improvement groups attempting to achieve them by exploit existing resources.

3. Twenty teams met briefly each month with the VP of Engineering to assess progress in identifying challenges and closing gaps

4. Seven months later, the teams reported their progress at an "all-hands" meeting in November 2013.

   - Almost all teams a defined the problem and identified steps needed for improvement
   - At least eight of the teams implemented one or more actual changes of consequence

### Comparative Results from a Quasi Experiment

An assessment of product development capability was conducted in 2012 and 2013 at the US and European locations. The survey focused at three levels of capability: system, project teaming, and leadership. All sites targeted improvement in five common gaps in best practices at the development system level. Because improvements targeted at the development system level were broad in scope, collateral impacts on leadership behaviors were likely. Therefore improvements in leadership in US experimental group were compared with the European groups as a control.

All sites recorded improvements in system level product development behaviors. Perhaps as a collateral effect, leadership behaviors also improved. The quasi-control group reported improvements in 11 of 27 leadership practices by 5 percent or more (which typically represents statistically significant changes). But the US site with the additional LDI program reported observance increased observance in 24 of 27 leadership practices by 5 percent or more during the year. The average percent improvement during the two periods is shown below for the average of 27 leadership behaviors.

| | | |
|---|---|---|
| Experimental Site | **66%** | **76%** |
| Quasi Control Sites | **66%** | **70%** |
| | Time One | Time Two |

Both comparison groups were initially the same, but the US group improved significantly more on average. One reason may be that it was the only group with an additional initiative specifically engaging the majority of their managers in improving leadership practices per se. Also, one of the extra three initiatives undertaken by LDI focused on coaching empowered cross-functional teams.

The 2013 scores for 10 leadership behaviors were statistically higher in the US group than the quasi-control group. The averages for 10 leadership practices are graphically illustrated below:
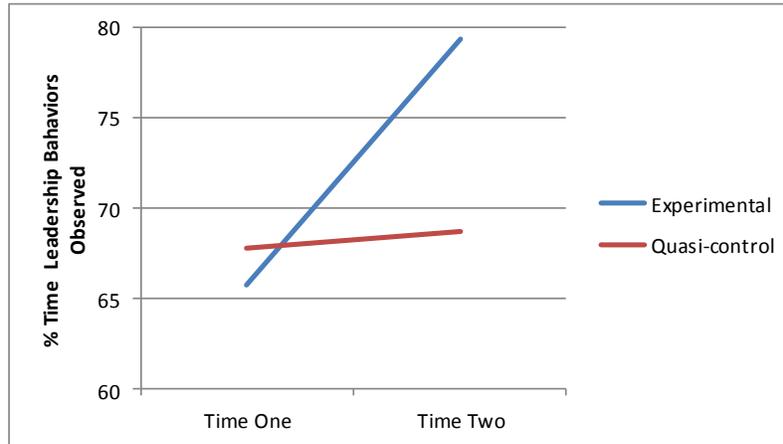
The impact of improved leadership behaviors on performance at the US experimental site is difficult to assess over a short period of time. Therefore, the potency of these 10 leadership behaviors was estimated by examining their association with project performance in two datasets: (a) the SPOT database and (b) an earlier survey of 8 major programs within the corporation under study.

*a.   Global Database: Leadership and Project Performance*

The 10 leadership behaviors have a significant association with project performance in the global archive as illustrated in the graph below where the lowest and highest is a standard deviation below or above the mean respectively.  10 leadership behaviors predict about a third of the variation in project performance.
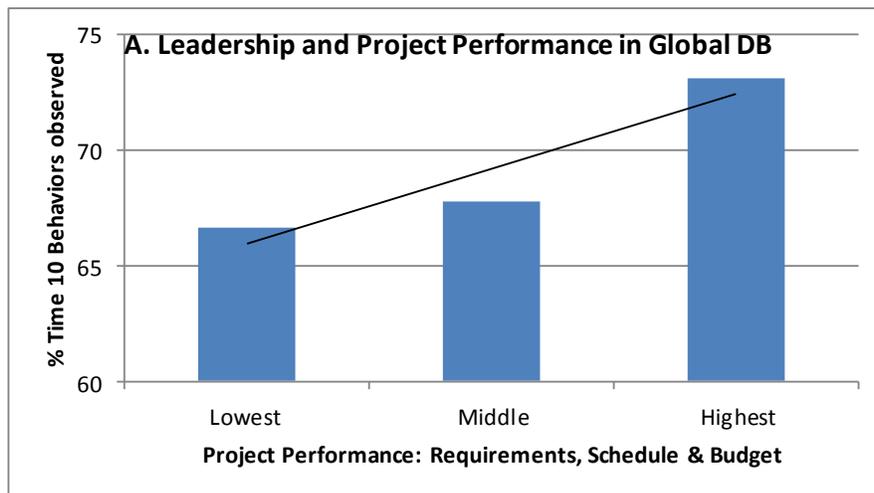


*b.   Corporate data: Leadership and Project Performance for 8 programs*

Analyses of prior data for 8 large programs in the host corporation shows a correlation of .67 between these ten leadership behaviors and project performance. The relationship is choppy at the lower end of leadership practices but fairly smooth at the upper end as illustrated in the graph of standardized scores shown the chart below. This result suggests that the relationship

between these 10 leadership practices with project performance holds at least to some extent in the internal corporation as well as in the larger SPOT databank.

**b. Leadership and Project Performance in Corporation**
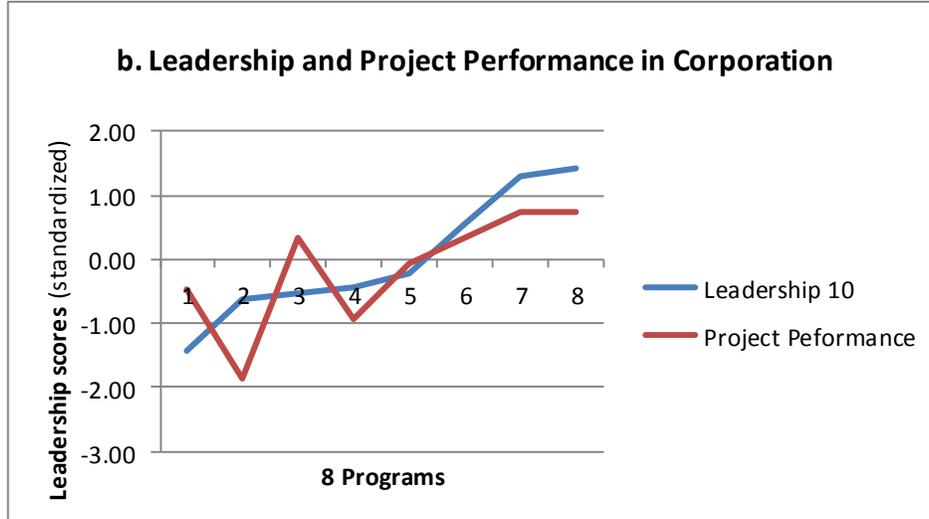


**Analyses of Best Leadership Practices**

Increasingly effective leadership means building and supporting teams. This means that the most important mode of leadership is indirect by influencing and coaching rather than bossing as illustrated in the diagram below. Moreover, analysis of the SPOT databank shows that the bulk of the impact of leadership on project performance is indirect via team behaviors. One inference is that effective leaders distribute some of the function to team member who help collaboratively steer the project toward successful execution.
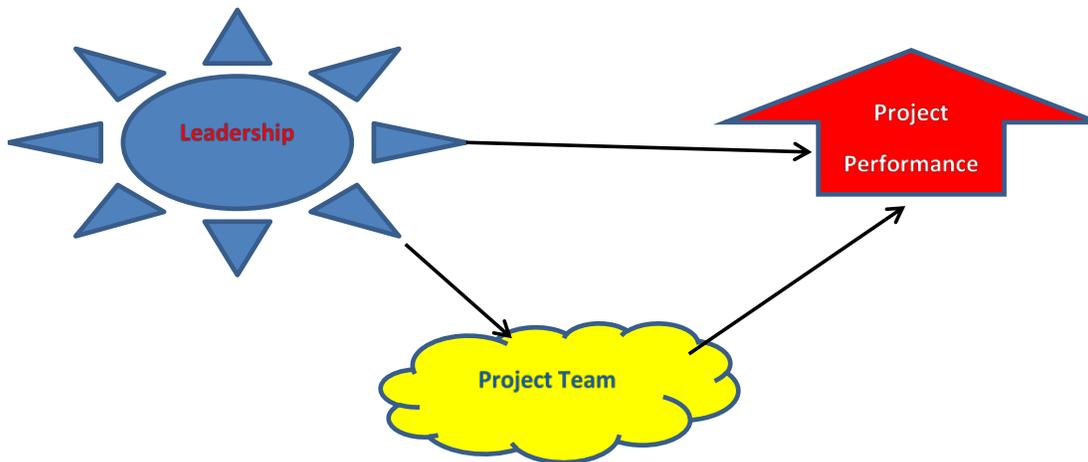


Evidence for the link between leadership and teaming is examined three ways: (a) global database, (b) corporate internal data, and (c) US experimental site. The 10 leadership behaviors correlate .76 with sixty teaming behaviors in the global database, .77 with twenty-eight teaming behaviors in the internal corporate data, and .70 with the same twenty-eight behaviors in the US experimental group. All three correlations show that over half of the variation in best teaming

practices is statistically predicted the 10 leadership behaviors. The 10 leadership behaviors work very well according to standards of behavioral science where relatively few studies show correlations are as high as these three.

### Improved teaming at the Experimental site: 26 of 28

How well the 10 leadership did practices correlate with the 28 teaming practices? The only two of twenty-eight correlations lacking in statistical significance dealt with adaptability. Among the strongest correlations are those showing the solidarity of the team. Perhaps the greatest challenge a leader faces in building a team is to encourage collective as well as individual effort to achieve goals. The strongest correlation ($r=.71$) with any of the team behaviors is for a key indicator of collective responsibility:

*Shared collective responsibility for project outcomes regardless of function*

Other strong correlations reinforce the notion that these 10 leadership practices are associated with team solidarity, e.g. other team members help by sharing knowledge and information; they acknowledged the contributions made by others on the team, etc. Such teaming practices as assumption of collective responsibility and collaborative sharing are among team practices with strong correlations with project performance.

### Profiling the Impact of 10 Leadership Behaviors on Performance

To understand how such team solidarity was achieved, the 10 leadership practices are profiled below.  The assessment methodology is based on the principles of concurrent and/or systems engineering. Three key domains of practice applicable at all levels of practice in product development operations are Strategy, Process and Organization (SPO).  Tools and technologies may also be relevant as promulgated by the Society of Concurrent Product Development (http://scpdnet.org), but these two sets of practice do not differentiate groups in the comparisons herein. This trio of practices is highly interactive in development systems operations. Synergistic interdependencies are illustrated by overlapping domains in the diagram below.



**Strategy**

Strategy has a strong correlation ($r=.55$) with project performance. Project leaders need to ensure the team collaboratively understands and enhances the strategic vision for the project. This practice is consistent with the #7 recommendation on the Google list. People on the team

need to be constantly setting and tracking objectives because product development is often highly complex and dynamic. As a development project grows in size, newcomers need to be engaged in helping to constantly refurbish strategic goals at least at the operational level. Without such involvement, many team members may make suboptimal trade-off decisions on the bench regarding time, cost, and quality. A lock-step approach to achieving initial goals risks operational success at the expense of strategic sub-optimization. Implicitly strategic engagement also touches on #5 on the Google list, which means not only communicating strategic vision, but also listing to the doers of their achievement journey.

The importance of building teams with a common strategic vision is reinforced by other analyses in the global database. At the system level of analysis, the strongest correlation with product development performance is "strategic engagement." Strategy realization is a process like constantly pealing the same onion yet discovering new issues. The more complex and dynamic the market, the more reiterative the strategic engagement process should be analogous to cycles of PDCA (Plan-Do-Check- Act).

**Process**

Process has a rather strong correlation with project performance (r=.64). A coaching and guidance style of leadership is consistent with the #1 recommendation on the Google list of eight top qualities of leadership. Coaching and guiding through influence rather than directives is especially important to the extent tacit, covert knowledge is necessary for achieving objectives. Even the most comprehensive processes cannot anticipate all contingencies. Therefore team members may need to help co-create processes which actually fit the work situation. Innovation may be planned to some extent. But it is difficult to command as too many unknowns require integration from people whose heads and hearts must be committed to accomplishing tasks creatively.

The importance of coaching instead of bossing is reinforced by additional analyses of the global database. Leaders who "expect subordinates to carry out decisions loyally without raising questions" manage projects with below average performance outcomes. Development systems with stage-gate are average performers unless their team have "bounded empowerment." Yet many large corporations reduce creative employees into ritualistic conformance with counterproductive rules. Their "processes," which should provide flexible guidance, become ossified in complex PLC procedures that override what Gino Addiego, VP at AMAT, aptly refers to as "human judgment." Exercising a coaching rather than a directive leadership style requires building and integrating the judgment of team players.

**Organization**

Leadership practices dealing with organization have significant correlations with project performance although sometimes not as strong those with that are more operations and easily defined. The correlation for the sum of six organizational leadership practices is moderate (r=.45). But the impact of leadership practices building team organization is often underestimated because the effects are diverse and often synergistically intertwined with others.

a.  Empowerment

Empowering teams is one of the most important and difficult to achieve of all leadership best practices. Although its correlation with project performance (r=.43) is not as strong as those for process or strategy, this is misleading. Empowerment is #2 on the Google list. But what the list does not show is that there are at least two pre-conditions for optimizing its benefits for project performance: strategy and process. This practice also touches on #5 on the Google list, listening to the team.

*First*, leaders must ensure empowered team members collaborative focus on the same strategic star. Given the context of process and strategy, leaders may eschew micro-management and empower teams who are thereby more likely to accept achieving the project goal as a personal as well as collective responsibility. But strategic leadership means more than pointing out direction. It also includes enabling the team during their strategic journey as a fellow stakeholder. The pie chart below shows results from moderated regression analysis. Slides of the pie represent the percentage of variance leadership practices explain in project performance. Empowerment of the team organization by the leader is entered first, followed by strategy. The synergistic benefit of this combination is shown in stripes and represents a sizeable synergy bonus for statistically explaining why some projects achieve higher outcomes than others.



**% Variance Explained in Project Performance**

- Team empowerment
- Strategic vision/support
- Synergy
- Unexplained
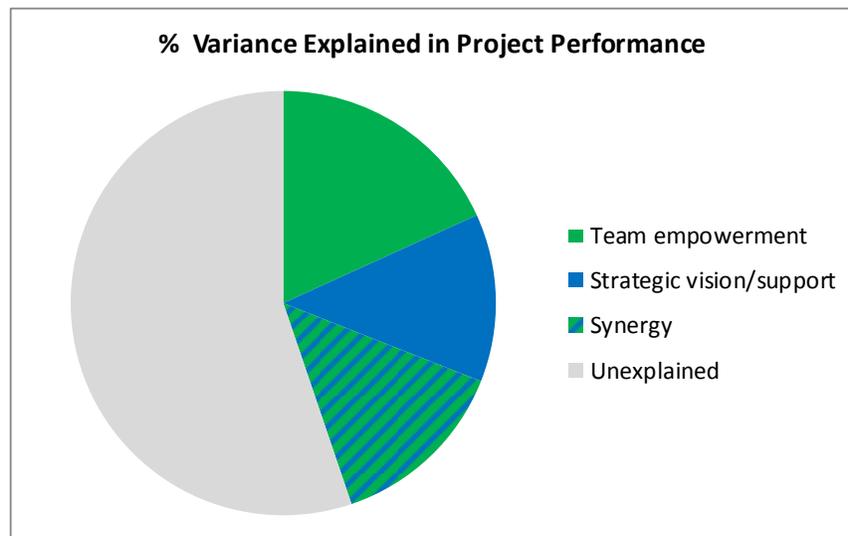
The secret challenge is that successful leadership goes beyond following a laundry list of actions. Judicious combinations of practices need to be architected contingent upon specific managerial situations. Although somewhat less than half of total variance in project performance is predicted, leveraging these two practices separately and in combination potentially provides competitive advantages for leading project execution.

*Second*, leaders need to coach empowered teams so that they buy into a common process. They also need to ensure that process is understood as a means to a strategic end, not an end in itself. The pie chart below shows results from moderated regression analysis where empowerment of the team organization by the leader is entered first, followed by coaching process. The synergistic benefit of this combination is shown in stripes and represents a sizeable synergy bonus that statistically explains why some projects achieve higher outcomes than others.

**% Variance Expleined in Project Performance**

- Team empowerment
- Process coaching/guidance
- Synergy
- Unexplained
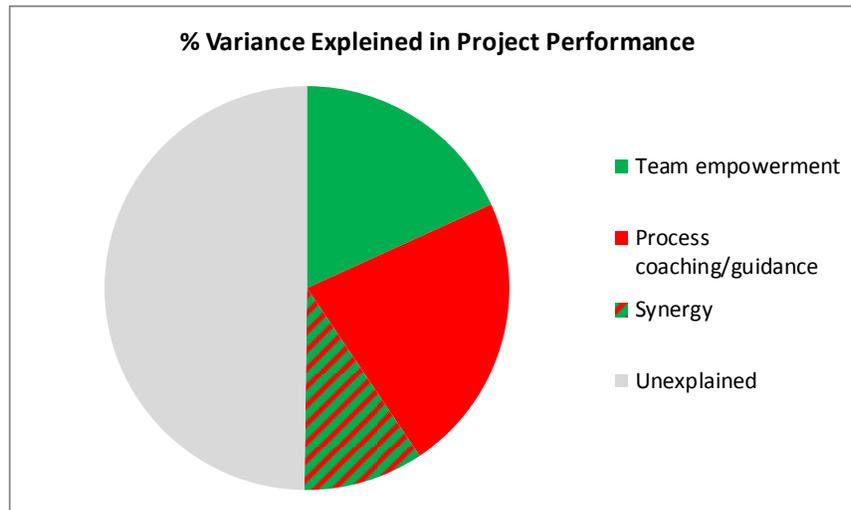
b.  Humanistic team focus

Human capital is far and away more critical than physical assets in an ever growing number of businesses today. So it is easy to suggest leaders show concern and support for the employees on their team. Expressing interest in team members' success and wellbeing is #3 on Google's list along with #6, helping people with career development, i.e., mentoring. However, this is often tricky as it is difficult to deal with the chemistry among members of the team as whole without playing favorites. Leaders need to reward team members as a whole as well as individuals to ensure that everyone is a stakeholder in the success of the project.

A people focused approach to team leadership has somewhat modest correlation with project performance (r=.38). One reason is that the benefits of focusing on people in a team is not only contingent upon synergy bonuses from combinations with strategy (19%) and process (6%), but also on the extent to which leaders are also instrumentally focused on results as discussed below.

c.  Instrumental focus

Employees are hired to help organizations achieve goals and need to be measured and rewarded for doing so.  Leadership that is results oriented is #4 on the Google list. However, assessing employee contributions is often difficult especially in long complex development projects. But intermediate performance benchmarks help. Hence instrumental leadership on short-term, measurable achievement for individual rewards has a moderate correlation with performance (r=.40) which may be synergistically augmented by synergy bonuses with strategy (12%) and process (4%).

Leaders will always be challenged to treat their subordinates as an end in themselves as well as a means because project and individual goal have conflicts that can never be entirely reduced. Managers who are able to synergistically balance a humanistic with an instrumental focus lead teams that achieve higher performance. The synergy bonus for project performance resulting by combining these two leadership practices is significant (10%).

The 10 leadership practices seem to have a high degree of overlap with Google's list of principles. The only on omitted was #8. While technical accomplishments of leaders may gain respect, some excellent managers in high-tech industries majored in non-technical disciplines such as English or Political Science.

### Five Pillars Leaders Can Count Upon

At least five general behaviors have been repeatedly identified of proven worth in research studies and experiences reported by students in executive education courses. These statements are more contextual than operational examples of specific, actionable practices. However, these generalizations may provide additional food for thought about how to grow leaders.

1. Provide strategic goals and objectives that are purposive and operational, but not so detailed and specific as to preclude innovation (unless exact specifications are prescribed)
2. Have your people set goals for themselves. Performance almost always improves even if their achievements are never measured or actually tracked for rewards (i.e., MBO)
3. Remove barriers, managerial and procedural, to enable and empower people with the means for achieving their goals and objectives (align ends and means)
4. Contingent upon the degree of knowledge required for performing tasks, use relatively more of a consultative, coaching leadership style than a directive, boss style
5. Focus on task performance with rapid instrumental feedback (PDCA) while balancing evaluations with emphatic concern for subordinates

Appendix A

## Examples of Leadership at the CEO level: Welch and Mulally

**Jack Welch:  Aligning ends and means at GE and its adaptation at Chrysler** (from J. Miller)

Jack Welch had some high performance managers who were getting results, but too often outside of approved procedures and / or at cost to subordinates. The edict came down from Welch that managers would be promoted only if the achieved objectives using appropriated means.



Evaluating Leadership Behavior

Results

| Good Results Poor Behaviors "LAST CHANCE" | Good Results Good Behaviors "PROMOTE" |
| Poor Behaviors Poor results "REMOVE" | Good Behaviors Poor Results "DEVELOP" |

Behaviors (Values)

Chrysler, in need of revitalization, had Welch speak to all the execs at a retreat at Port Huron. This chart was an integral feature of their improvement plan. As John Miller, formerly VP of large car can detail, improved leadership helped Chrysler achieve banner quality and profits not long before its acquisition by Daimler. Many of the same leadership practices at Google were also deployed at Chrysler.

**Alan Mulally: Work Together**

[http://changethis.com/manifesto/93.01.AmericanIcon/pdf/93.01.AmericanIcon.pdf](http://changethis.com/manifesto/93.01.AmericanIcon/pdf/93.01.AmericanIcon.pdf)

The Ford that Mulally inherited was notorious for its sharp-elbowed corporate politics and boardroom backstabbing. The company's culture had become so caustic that every good idea and smart initiative was stillborn; executives were too focused on preserving their own fiefdoms to worry much about the overall success of the company. Before he arrived in Dearborn, high-level meetings were arenas for mortal combat. Executives would enter them looking for weak points in each other's armor, ready to jam in a shiv. This made it impossible to have an honest discussion about the company's many challenges, because any time an executive admitted they had a problem, their rivals would pounce.

But Mulally had zero tolerance for that sort of nonsense. He imposed strict ground rules that prohibited jokes at each other's expense, and he encouraged cooperation by tying each executive's performance rating to the success of the organization as a whole. He made everyone see that they were on the same team and that, by playing together as a team, they could win.

Mulally's own leadership style reflected this. He was a coach, not a king. While he relished the spotlight that came from Ford's amazing resurgence, he was constantly pulling other executives into with him. In his weekly meetings, he urged Ford's senior leaders to offer each other help. He asked for solutions, rather imposing them. "Working together always works. It always works," Mulally told me. "Everybody has to be on the team. They have to be interdependent with each other. "Working together always works. It always works," Mulally told me. "Everybody has to be on the team. They have to be interdependent with each other."