

White Paper:

Leadership and Learning Best Practices For Scientists, IT, Software and Engineering

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Executive Summary

This White Paper provides fresh thinking about how people in science, IT, software and engineering can improve their leadership effectiveness. The paper explores:

- The importance of leadership in technical organizations
- Challenges to leadership in technical organizations
- Mistakes technical professionals make in leading
- Leadership core competencies in technical organizations
- Mistakes technical professionals make about learning leadership
- A model for learning leadership that generates meaningful, lasting results

Good Ideas Are Not Enough:

Understanding The Critical Importance Of Leadership In Technical Organizations

Increasing the leadership effectiveness of leaders at all levels is essential to the overall organizational success of scientific and technical organizations for two major reasons: scientific and technical organizations' core business involves translating new ideas into tangible products and services, and scientific and technical organizations use a "flat" organization structure.

Success in scientific and technical organizations involves turning new ideas into tangible products and services. Unlike insurance companies, banks, construction or factories, scientific and technical organizations work with the unknown most of the time. Their core business involves translating concept into reality, and that translation involves extensive and complex dialog, communications and conversation at multiple levels.

Most scientific and technical organizations are "flat," with little clear hierarchy or chain of command. In this kind of organization structure, the development and advancement of new ideas depends in large part on the leadership and communication skills of people at all levels in the organization. If project team leaders can't effectively lead team discussion, viable ideas falter and the team can develop and advance weak concepts. If individual leaders dominate in one-on-one discussions, they also may stop the development of viable concepts and sustain the development of weak concepts.

Leadership Challenges In Science, IT, Software and Engineering

While effective leadership is essential in technical organizations, several powerful sources make their job challenging. It is important to recognize these challenges because effective leaders must address them:

1. Ambiguous organizational support. Lacking a clear hierarchy and chain of command in more traditional organizations, the flat organizations that prevail in

- technical fields provide minimal support for their leaders. Leaders in the middle of the organization are “empowered” to do what they need to in order to get a job done, but they are also unprotected and vulnerable when they make mistakes.
2. Technical people often resist direction. Valuing objectivity more than blind adherence to direction, technical people routinely question authority. Some technical professionals extend this stance to a more aggressive one, routinely resisting authority. This stance can prove challenging for the leaders who asks them to take action simply because he or she is “in charge.”
 3. Technical people lack people skills. Most technical leaders are much more skilled at working in their own field than they are at communicating what they know. They lack the training and the expertise in the communications skills that contribute most to effective leadership.
 4. Technical fields don’t value high levels of competence in communications. Scientists win awards for scientific discovery, not for effective communications and leadership. Much the same holds true in IT, software and engineering.

“If I’m The Expert, Why Aren’t You Listening To Me?” Seven Mistaken Assumptions Technical Leaders Hold

Aside from the external challenges they face, technical professionals who ascend to leadership positions fall prey to mistakes and faulty assumptions they themselves make. Identifying these mistakes provides a foundation for understanding the core competencies that effective leadership requires. They mistakes include:

1. *The leader is the expert.* Many technical professionals know at some level that this is not true, but their own experience and the expectations of others often brings them back to believing that expertise = leadership.
2. *Good employees don’t question leaders.* This assumption follows logically from assuming that the leader is the expert, and results in the quote above, “If I’m the expert, why aren’t you listening to me?”
3. *Ineffective communications skills are acceptable for technical leaders.* Reverting back to their training and the culture of their technical fields, technical leaders sometimes set the bar low in their expectations for effective communications in leadership positions.
4. *“Bad behavior” is acceptable in pursuit of the right answer.* Technical leaders given to temper tantrums, outbursts and demeaning behavior mistakenly justify these in the heat of discovery, neglecting or being blind to the lasting damage their actions can cause.
5. *Good ideas speak for themselves.* Following from this assumption, many technical leaders chronically under communicate, assuming that worthy ideas will create their own pathways to success. In flat organizations, however, it takes a great deal of effort to make sure that all the relevant stakeholders on a project get the information they need.

6. *In meetings, silence implies agreement.* When just a few people in a meeting participate actively in discussion, it's understandable that a group leader can believe that all parties present agree with the group's decision. This is a faulty assumption. Silence often means more that participants are introverted, thinking deeply, not quite ready to talk than that they agree with the vocal minority.
7. *The point of meetings is to reach agreement.* Technical leaders frequently have to work hard just to get a project group to reach agreement. It is understandable that they often lose sight of trying to have the group come up with an optimal solution, not just one that team members agree to.

Four Useful Concepts From Leadership Theory

Hundreds of articles and books on leadership are published annually, and many of these offer useful for technical leaders. Four classic theories that offer special value for technical leaders include Behavioral theory, Transformational leadership, Model II and Level 5.

1. Behavioral Theory, which evolved in the late 1940s when researchers observed the behaviors of effective leaders, involves two concepts highly relevant for technical leaders: initiating structure and consideration. It's necessary, in flat organizations to be able "initiate structure" in order to undertake new tasks. First identified a one of two essential leadership practices by behavioral theorists in the 1940's, this practice holds special importance in technical organizations. Initiating structure means that even though a person has never done a task before, he or she somehow knows what to do to set goals, establish a direction, engage people and make progress. Initiating structure means the leader may not have the answers but is equipped with methods and skills to find them. Consideration, the second part of behavioral theory holds that effective leaders must demonstrate a basic consideration for their followers. This point of view opposes leaders' mistaken assumption that "bad behaviors" are justifiable in the pursuit of correct answers. In flat technical organizations, consideration provides an essential building block for enlisting support and engaging others at all levels.
2. Transformational Leadership, articulated by James MacGregor Burns in his Pulitzer prize-winning book *Leadership* in 1978, makes the argument that leaders have the potential not only to "transact" and make deals to elicit support. They also have the ability to transform both themselves and those they work with. This point of view counters technical leaders' notion of the leader-as-expert, portraying the leader as someone who learns.
3. Model II. Argyris and Schon's theory of Model II leadership, popular in the 1970s' and 1980's portrays the leader as someone who *both* advocates and inquires. In other words, leaders don't blindly dominate others or cave in to others' requests. Instead, they balance advocating their own point of view with vigorously inquiring into the ideas that others bring to the table. Valuing inquiry and discussion, this approach contrasts with the notion that expert opinions should rest unchallenged.
4. Level V. Based on thorough research of high-performing organizations in numerous markets over extended periods of time, Jim Collins' book *Good To Great* defines Level

V as the ultimate rung on the leadership ladder. Level V leadership is distinguished from other levels of progressively effective leadership by its combination of a unique, counterintuitive quality of humility and unwavering perseverance. Level V leaders are selfless, “servant” leaders. Level V leadership challenges the notion that successful scientists are also inherently good leaders. Level V is especially relevant for technical leaders because it describes a style of leadership that, like many technical professionals is introverted. It is also relevant because it points to aspects of leadership performance beyond driving a project home to building an infrastructure for a self-sustaining organization.

Eight Core Technical Leadership Competencies

Combining the leadership theories above with our own observations working with thousands of technical leaders in a wide range of scientific, IT, software and engineering organizations, we identify eight core competencies as essential for technical leaders:

1. Formulate and articulate goals (initiate structure). The flat organizations technical leaders work in require that leaders be able to formulate direction and progress in uncharted terrain.
2. Show consideration/ treat people with respect (behavioral theory). Consideration is a necessary competence because it underlies fully engaging staff and stakeholders in project work.
3. Both advocate a point of view and inquire, working constructively with others’ ideas (Model II) This competency is necessary in order to effectively develop ideas and concepts.
4. Both provide support for others and challenge them to continuously higher levels of performance (transformational leadership). This competency elevates performance to higher levels and turns the leader into a learner.
5. Communicate clearly, completely, skillfully to strengthen idea development. Flat organizations require skillful transmittal of information.
6. Lead meetings to effectively, evenly engage all participants. Much project work is done in meetings involving people with diverse experience and communications skills. It is essential for leaders to fully engage all the resources at the table.
7. Lead meetings to achieve high levels of group performance in solving problems. Getting a group simply to agree is not enough. Effective groups develop real skill in solving problems and making decisions.
8. Partner effectively with other departments and organizations. Effective technical leaders don’t just lead their own groups, they also partner effectively, laterally with other departments and at times, other organizations.

Problems With Leadership Training Programs

Many technical professionals expend a great deal of effort and hard work to become better leaders, but the results of their efforts often fail or fall far short. Several factors account for ineffective leadership training:

- *Focusing on theory rather than action:* Leadership theory and writing provide useful insight and ideas, but many technical leaders fail to balance their understanding of concepts with an understanding of their own behavior and its effects.
- *Employing one-time seminars and retreats rather than programs that last longer:* One-time seminars and retreats are a popular format for leadership training because they are intense, efficient, and easy to schedule. However, one-time programs are doomed to produce limited results, especially when it comes to changing old habits, learning new behaviors, and incorporating new skills into ongoing work. To address these issues, leadership training that spreads sessions over a longer period and builds on application of concepts and skills is likely to produce more lasting results.
- *Participating in training with peers:* Technical leaders justifiably complain that leadership training programs in business schools and management institutes do not contain enough relevant case material. However, technical leaders who participate in leadership training only with their professional peers (clinicians with clinicians, IT managers with IT managers, etc) often encounter a kind of professional bias and blindness that limits the value of the training. Optimal leadership training groups for technical leaders should peers from other disciplines, “internal customers” and partners in order to provide a more complete learning environment.
- *Focusing on only one or two kinds of learning:* Much leadership training emphasizes only one or two kinds of learning, e.g., understanding the effects of one’s communications style on others, setting goals, or coaching and counseling. Just as leadership itself is more complex than simply knowing how to understand others, so leadership training that produces lasting results requires multiple kinds of learning.

Technical Leadership Training Model

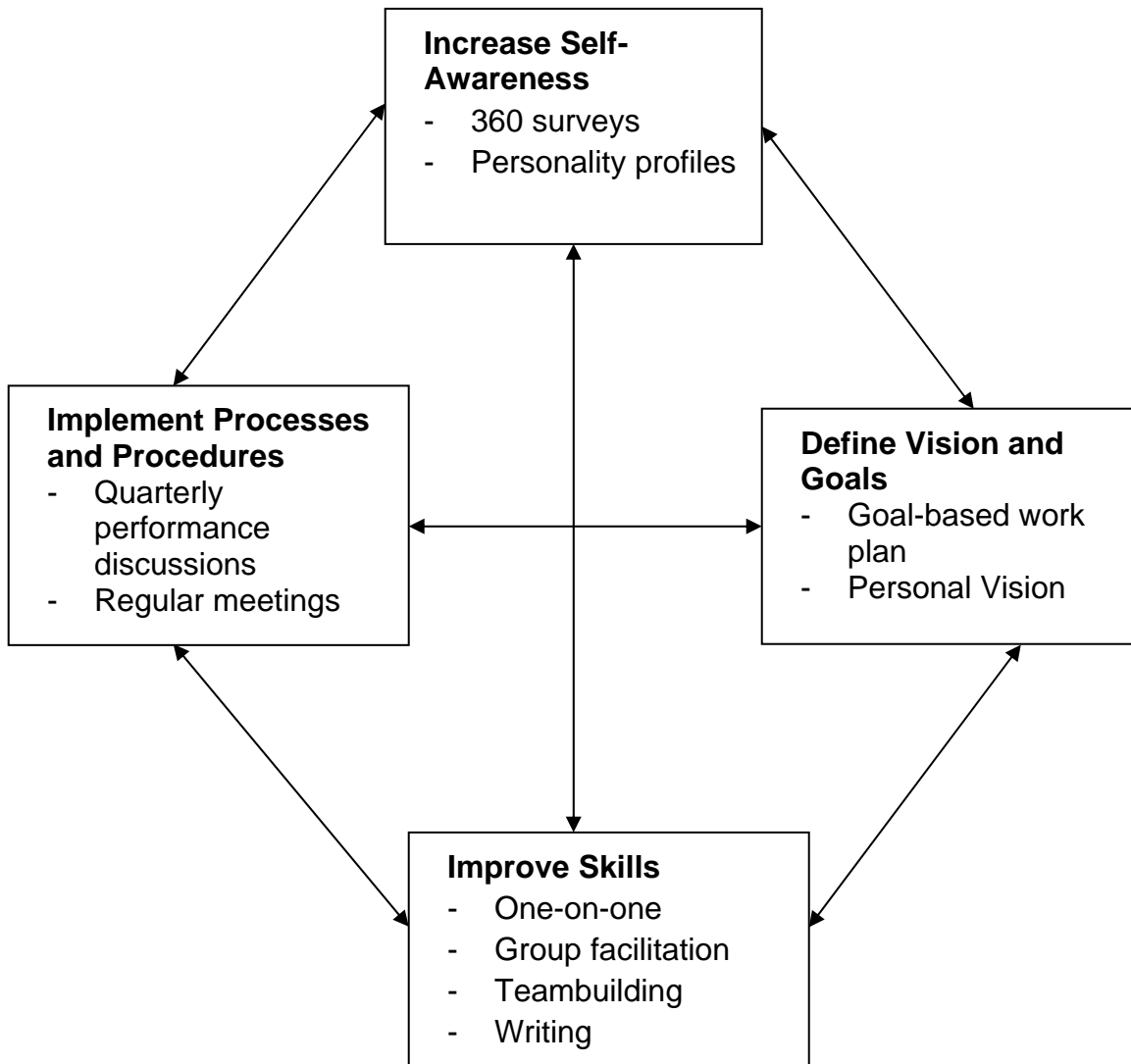
Beyond the format for leadership training and development, it is essential to consider the content of leadership training. The model for leadership training presented here, based on the theories previously profiled, categorizes leadership training into four types of learning:

- **Increasing self-awareness.** This aspect of leadership training recognizes the importance of understanding real-world behaviors. Leaders can develop an ability to recognize the ways in which they are effective, and how others perceive them. For this kind of learning, leaders can use 360-degree surveys of their communications style, personality profiles such as the Myers-Briggs Type Indicator, the DISC, and the Predictive Index®.
- **Defining vision and goals.** This aspect of leadership training is based on situational leadership and contingency theory. For this kind of training, a leader determines which roles are most important for him or her and what performance criteria are appropriate for those roles. Training tools leaders can use for this kind of learning include a personal vision statement, which clarifies overall individual goals, and a goal-based work plan, which specifies job roles, priorities, and expected outcomes. This aspect of leadership training is also inspired by the transformational leadership theory in that it suggests goals can transcend mere accomplishment of tasks and include higher orders of learning and development.
- **Improving communications.** This kind of leadership training reflects the notion, which is part of all four leadership theories, that leaders must be highly proficient communicators. Leadership in technical organizations often involves communicating difficult messages, for example, telling clients things they don't want to hear, providing constructive criticism to subordinates and peers, and expressing complex concepts. Technical leaders who want to improve their leadership performance must especially strengthen their skills in collaborative communications, as they operate in many collaborative situations with clients, peers and subordinates.
- **Improving processes and procedures.** This aspect of leadership training stems from the concept of "initiating structure." Technical leaders can learn to apply problem-solving skills they have gained through the design process to develop processes for carrying out leadership tasks. For example, many technical organizations use outdated methods to conduct design reviews, monthly meetings, project meetings, and performance appraisals. Leadership development encourages leaders to formulate more effective structures for carrying out such tasks.

The model posits that leadership training should involve all four kinds of learning and that work in any one area should complement, reinforce, and advance work in the other three. For example, when leaders improve their awareness of how they affect others, it can help them develop more targeted goals for how they communicate. Formulating goals creates a need for skills. Building skills improves a leader's level of performance, changes his or her effect on others, and encourages the individual to formulate goals at a higher level.

Technical Leadership Training Model

Four different kinds of learning contribute to leadership development. The different kinds of learning reinforce and complement each other.



Six Leadership Training Tools

Six tools for leadership training fit into each of the four learning categories in the model above and also refer to the previously detailed leadership theories:

1. 360-degree surveys (awareness learning)
2. Personality profiles (awareness learning)
3. Goal-based work plans (goals learning)
4. Personal vision statements (goals learning)
5. Communication skills
 - a. Presentation skills
 - b. One-on-one collaboration skills
 - c. Meeting and facilitation skills
6. Leadership processes and procedures
 - a. Meetings methods and processes
 - b. Design reviews
 - c. Performance appraisals and performance management

360-Degree Communications Surveys

A 360-degree survey can provide leaders with valuable data about their leadership performance. Technical leaders in particular learn from these surveys because they provide data in an area that is often mysterious for them. Leaders give the survey forms to a select group of people they work with, usually eight to fifteen individuals, including subordinates, peers, and clients. Respondents complete the surveys anonymously, and an objective third party tabulates the results and provides the leader with a report showing anonymous aggregated data to ensure that individual respondents' survey answers are kept confidential.

Often, gaps exist between technical professionals' perceptions of themselves and the perceptions of their staff, peers, internal and external customers and stakeholders. Such gaps are inevitable in because there are few ways for leaders to get coherent, balanced feedback on the effectiveness of their communications. By providing data that is organized, confidential, and comprehensive, 360-degree surveys can help technical professionals close this perceptions gap.

While surveys provide more accurate data about communication than informal feedback, they do have some limitations. Organizational successes, failures, and pressures can shape survey responses. In particular, concerns about confidentiality can inhibit respondents' comments. Respondents' past experiences with misuse of 360 surveys, even if they occurred at another organization, can inhibit their responses to current survey efforts. In addition, low response rates can create misleading perceptions.

Despite these limitations, 360-degree surveys provide more valid data than informal feedback, which tends to emphasize high and low spots in communications and neglect the everyday middle ground. Surveys that give respondents the time and structure to assess communications performance thoughtfully can yield more reasoned perceptions and opinions.

Like any tool, however, 360-degree surveys can be misused. To ensure optimal benefit from using this tool, it is essential to keep several things in mind:

- Respondent confidentiality must be absolute. Even suspected lack of confidentiality can taint the validity of the survey results, not to mention that it is unethical to promise something will be confidential and then to reveal the name of a respondent.
- A leader interpreting the results from a survey of him- or herself should focus on the responses to a handful of questions of particular significance to his or her role. Avoid getting bogged down in the responses that reflect your weaknesses.
- Responses to quantitative questions provide a framework for the survey results and an overall view of the leader being studied, while responses to open-ended questions add color and nuance to the survey results.
- For the survey to best serve the leader, the results must lead to action. A leader who has been evaluated can develop goals to address what has been learned from the survey.
- Survey results should be informally linked to performance measures so leaders being surveyed understand how others' perceptions figure in assessing their leadership performance. On the other hand, attempting to rigidly link survey results with performance metrics often discourages leaders from obtaining the feedback they most need to hear and occasionally leads to tampering with the overall survey system.
- Technical leaders receiving survey data can benefit from sharing and discussing their results with peers. Few people can accurately interpret the data they receive or translate their insights into useful action steps on their own.
- Technical leaders receiving survey data may find it helpful to discuss their survey results with the people who responded to the survey. This does not, of course, mean asking them to comment on their responses. Rather, the idea is to provide a forum in which respondents can provide more data and react to the leader's action plans. Most importantly, this approach lets respondents know the leader is taking the process seriously.

Gathering Pace, Inc. 360 Survey Sample

1.

1. Informational/ This individual:

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	N/A
Provides adequate information.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Is accessible.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Is approachable.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Communicates clearly and completely.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

2. Interpersonal/ This Individual:

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	N/A
Treats others with respect.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Listens effectively.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Participates effectively in meetings.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Communicates openly and directly.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

3. Strategic/ This Individual

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	N/A
Effectively communicates goals and vision.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Actively supports company goals.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Works effectively with other departments.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Maintains appropriate strategic focus.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

4. Staff Management/ Development// This Individual:

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	N/A
Understands what staff does.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Provides adequate positive feedback.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Provides adequate, effective criticism.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Holds staff accountable appropriately.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Motivates staff.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Provides for effective employee development.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

5. Leadership Effectiveness/ This individual

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	N/A
Focuses on appropriate leadership tasks.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Innovates, thinks "outside the box."	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Challenges self to continuous improvement.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Challenges others to continuous improvement.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Page 1

Gathering Pace, Inc. 360 Survey Sample

6. Overall// This individual:

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree	N/A
Communicates effectively	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Leads effectively	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

7. Please list the three most important leadership/ communications tasks this person does well.

- A.
- B.
- C.

8. Please list the three most important leadership/ communications tasks for this person to improve on:

- A.
- B.
- C.

Personality Profiles

Most leadership training and development programs use the Myers-Briggs Type Indicator (MBTI), the DISC, the Predictive Indicator, or other personality profiles, and with good reason. Personality profiles help leaders improve their understanding of themselves and of others. This understanding is an essential foundation for higher leadership performance levels such as transformational leadership and Collins' Level 5.

Personality profiles can improve the awareness of leaders in four primary ways:

1. **Clarifying “blind spots.”** Personality profiles help technical leaders identify which aspects of their work feel least “natural” to them.
2. **Building a time management agenda.** All respondents tend to spend more time on tasks they feel comfortable with and neglect tasks that come less naturally. As technical leaders progress in their careers, an awareness of their preferences and blind spots can help them manage their time so that tasks they might neglect or under-value are not ignored.
3. **Building on strengths.** As they progress in their careers, it is important for technical leaders to develop a leadership style based on their own deeply seated values and comfort. Working with personality profiles can help technical leaders rediscover long-standing aspects of their personality that they may have neglected while meeting other responsibilities.
4. **Understanding others.** Technical leaders who aspire to transformational leadership or Collins's Level 5 leadership need tools for understanding others in some depth. No matter which personality profiles is employed, valuable detail can be obtained about what makes people tick. Leaders who want to improve their ability to motivate and inspire others will find this information very useful.

Goal-Based Work Plans

What roles should technical leaders fill? How can their performance in these roles be measured? How should effective leaders spend their time and focus their priorities? The goal-based work plan is a useful tool to clarify roles, performance, and priorities. Roles that technical leaders may want to consider include scientist, auditor, analyst, manager, coach, partner, mentor, team builder and thought leader.

Technical leaders can use a worksheet to help them clarify and refine an optimal set of roles, job priorities, and deliverables for their job at any given time. Although it is possible to work on this alone, they often find it much more effective to work on their individual forms in a group. Working either individually or in a group, completing the goal-based work plan worksheet involves the following steps:

1. Divide your job into seven to ten major task categories in the tasks column. About half the tasks will be technical/quantitative, e.g., analyzing data, writing reports, developing study design, managing project schedules, etc. The other half will be more qualitative and communication-based, e.g., building the project team, partnering with a customer, or mentoring young team members. On your worksheet, begin each task with a verb, e.g., manage, lead, partner, communicate.
2. Allocate percentage points (totaling 100 percent) among the tasks in a way that reflects what you view as your *optimal* priorities. This step is meant to help you identify the relative importance of the tasks, so do not simply log how you currently spend your time. Rather, focus on the tasks and determine which have the highest priority, without regard to the time they take.
3. For each task, specify several tangible, quantifiable outcomes, results, or measures. This is relatively easy to do for technical tasks but more difficult for qualitative tasks. For example, it is easier to measure the extent to which your projects are profitable than it is to assess your effectiveness in developing young designers.

The goal-based work plan form is an excellent tool to use at key moments in a technical leader's career development: promotion to a new level in the organization, the beginning of a new project, and a change in job priorities. Some firms use the goal-based work plan as an integral part of their regular management of employee performance, enabling all employees to update their plan on a quarterly basis based on feedback.

The following two pages illustrate how the goal-based work plan is used to rethink the optimal roles and responsibilities of a statistician in a pharmaceutical company so that the statistician plays a greater leadership role.

The Statistician's Job: Traditional View

Priority/ 100%	Tasks Divide your job into 7 - 10 task categories. Half will be technical/quantitative, half will be more qualitative	Outcomes For each task, note anticipated outcomes, results. Use numbers and time lines when possible.
20	Analyze research designs	<ul style="list-style-type: none"> • Find flaws • Point out mistakes • Back up analysis
20	Estimate sample sizes	<ul style="list-style-type: none"> • Numbers of estimates done / month • Accuracy • Validity
20	Interpret data	<ul style="list-style-type: none"> • Correctness of analysis • Validity of response • Statistician peer review
15	Write reports	<ul style="list-style-type: none"> • Quality • Comprehensive • Well-documented
10	Provide support when asked	<ul style="list-style-type: none"> • Return calls quickly
5	Correct erroneous research	<ul style="list-style-type: none"> • Provide back-up • Defend reasoning
5	Rein in clinicians	<ul style="list-style-type: none"> • Confront when necessary • Be persistent in a professional way
5	Enforcer/ Police	<ul style="list-style-type: none"> • Always do the right thing • This is truly our role

The Statistician's Job: Revised To Reflect Leadership Stance

Priority/ 100%	Tasks Divide your job into 7 - 10 task categories. Half will be technical/quantitative, half will be more qualitative	Outcomes For each task, note anticipated outcomes, results. Use numbers and time lines when possible.
15	Analyze research designs	<ul style="list-style-type: none"> • Find flaws, point out mistakes • Back up analysis • Explore alternative solutions and approaches
10	Estimate sample sizes	<ul style="list-style-type: none"> • Numbers of estimates done / month • Accuracy, validity • Explore alternate approaches
15	Interpret data	<ul style="list-style-type: none"> • Correctness of analysis • Validity of response • Statistician peer review
10	Write reports	<ul style="list-style-type: none"> • Quality • Comprehensive • Well-documented
15	Initiate support	<ul style="list-style-type: none"> • Initiate new forms of support • Respond to request • Invite self to meetings • Learn clinician priorities
10	Add Value	<ul style="list-style-type: none"> • Explore alternative applications for statistics in the organization • Synthesize data, look for patterns
15	Partner with clinicians	<ul style="list-style-type: none"> • Build relationships • Devise new approaches • Confront when necessary • Maintain standards
10	Learn the science	<ul style="list-style-type: none"> • Function as clinical collaborator • Explore possible collaboration •

Personal Vision Statements

Taking on new leadership roles provides technical leaders with many opportunities for personal growth. However, because such major steps can separate an individual from his or her core sources of motivation and self-understanding, these career advances can sometimes lead to work that is frustrating and empty. Writing a personal vision statement can help technical leaders determine which roles they want to take on and which they want to leave to others.

Leadership roles frequently assumed by technical leaders include managing others, managing budgets and finances, working at marketing and business development, and moving from technical professional to project and organizational manager. Individuals respond to these challenges in different ways. Some may find the new roles unpleasant or unnatural. Others may find them more enjoyable than they had anticipated. The latter group may feel the new tasks allow them to play out parts of themselves previously untapped.

Writing a personal vision statement provides a framework for reflecting on which roles are best for the individual take on. The statement is a written document that clarifies core values, aspirations, sources of energy, motivations, and goals. It can take a variety of forms—a paragraph, a poem, a list, a collage of images; however, it is important for the statement to be recorded and not simply “kept in mind.” Several studies suggest the likelihood of achieving personal goals increases dramatically when they are written down.

More important than the form a personal vision statement takes is the function it should serve. The statement should work like a divining rod to lead an individual back to core sources of energy and motivation. Many people find it useful to post the statement where they will see it often, for example, on a bathroom mirror or car dashboard or inside an appointment book.

Communication Skills

To be effective, leaders need a high level of communications skills in both one-on-one and group situations. When a technical leader formulates project goals, takes a concept to a next step, motivates young professionals, builds the office team or partners with clients, he or she must be able to communicate in an engaging way.

Improving one-on-one communication skills requires a different kind of learning than that needed to build awareness or formulate goals—much more work with practice than with theory. The skills to be acquired are actions, more like golf or tennis than chess. The theories behind the skills are fairly clear and simple. The difficult thing is changing one’s habits and building the skills into an everyday approach.

Communication skills are an aspect of leadership that books and seminars can help leaders improve. Seminars can provide supportive, productive environments for learning these skills, especially when they enable participants to apply and then to practice them. Numerous books can reinforce the interactive work done in seminars. Two especially useful volumes are Thomas Gordon’s *Leader Effectiveness Training* and Robert Bolton’s *People Skills*. Both provide

excellent explanations of why the skills work and many examples illustrating use of the skills in real situations.

Group communications are also important for technical leaders, who must be able to present effectively to small and large groups in formal and informal situations. Many excellent seminars, coaches, and consultants provide assistance for leaders who want to refine their presentation skills. Participation in Toastmasters meetings can also help leaders improve the skills needed to improve group communications. Toastmasters groups meet once or twice a month and offer participants numerous opportunities to practice and refine their skills.

Group discussions require facilitation skills different from those for doing presentations. Facilitating a meeting means structuring discussion with carefully prepared questions and breaking the group, even when it is small, into smaller subgroups. Experienced facilitators use this skill to ensure that all participants are actively engaged at any meeting..

Leadership Processes and Procedures

After building awareness, setting goals, and improving skills, it is often useful for leaders to implement a process whereby their new skills can be used most effectively. This ability to define and implement processes is what behavioral leadership theorists mean by “initiating structure” (i.e., intuiting a process or procedure for addressing a problem or exploring an opportunity).

Processes are the sleeping giant of leadership development and training tools. Most often, when technical leaders they think of leadership training, they think of the tools mentioned above and overlook the power that initiating new processes can have in improving leadership performance. This is particularly ironic because initiating these processes resembles the engineering and development process, giving technical leaders the possibility of tapping into their design skills to improve in this aspect of leadership.

Technical organizations too frequently draw on a number of less-than-optimal processes in their everyday work. Technical leaders can substantially enhance their own performance (as well as their organization’s) by paying attention to these processes and creating better ones whenever possible. There is significant room for improvement in several processes that plague technical organizations.

- **Performance appraisals.** Few technical organizations are satisfied with the processes they use. There is great potential to enhance leadership performance by replacing outdated, ineffective annual appraisal systems with more agile quarterly coaching and counseling.
- **“Lessons learned” and design review meetings.** Most technical professionals agree it is useful to learn from past experiences, but few are able to sustain group discussions on this subject without having them turn defensive and inhibiting. Leaders who can initiate, design, and implement productive “lessons learned” discussions advance their own leadership performance as well as the culture of their firm.
- **Project budgeting and profitability.** Few technical organizations derive optimal value from their finance staff. Technical leaders who can devise more productive

methods for meshing project and finance information and for financial reporting are successful leaders.

Although streamlining such processes clearly enhances leadership performance and thus are legitimately (some would say essentially) a part of leadership training, they are seldom included in leadership training programs. One useful reference that provides both insight and detail into this aspect of leadership training is Donald Schon's book *The Reflective Practitioner*. In it, Schon describes how ongoing reflection and inquiry into their practice can give professionals a fruitful avenue to enhancing leadership and learning.

Leadership Development: Action Learning

Meaningful leadership development for technical leaders need not be mysterious or all-consuming. However, it does need to be thoughtful and comprehensive if it is to achieve significant results. Like many managers and professionals, some technical leaders work hard at leadership development only to achieve limited results because they concentrate their efforts too narrowly. Others find ways to learn efficiently, improving their performance with little effort.

Leadership in some ways resembles golf, tennis, and other action skills. The concepts are pretty simple (keep your eye on the ball, Treat others as you would have them treat you, and so on). In leadership as in sports, however, implementing and executing concepts can be excruciating.

Most golfers know that improving their game requires both working with a variety of approaches and methods and continual practice. The same is true for leadership development. Whatever one's level of leadership performance, working with a variety of approaches and methods (taking stock, clarifying goals, improving skills, and implementing processes) and practicing consistently over time can produce noticeable gains.

For More Information: Bibliography

General books about interpersonal relations can be a good place to start if you want to improve your leadership skills. *People Skills* by Robert Bolton (1979) and *Leader Effectiveness Training* by Thomas Gordon provide useful insight into the nature of effective communication and other interpersonal skills especially important for technical leaders. *The Seven Habits of Highly Effective People* by Stephen Covey provides a worthwhile look at the need for listening: “Seek first to understand before trying to be understood.”

A few books on leadership provide a sound background for embarking on a training and development program. In his book *Good to Great* (2001), Jim Collins uses extensive empirical research to support his Level 5 leadership theory. The typical MBA text *Organizational Behavior* (1984), by Jerry L. Gray and Frederick A. Starke, provides extensive information about leadership theories and their evolution over time.

Books about leadership especially for technical professionals usually feature the following two titles. Donald Schon, in *The Reflective Practitioner* (1983), writes eloquently about the nature of personal development in the professions and technology in particular. Our own book *The Partnering Solution* (Career Press, 2005) reinforces many of the concepts in this White Paper and features a chapter on Partnering Leadership.

Laurie Beth Jones provides practical, usable instruction for the complex task of writing a personal vision statement in *The Path: Creating Your Mission Statement for Work and for Life* (1996).

About The Author, William C. Ronco, Ph.D.



William C. Ronco, Ph.D. has over 25 years experience and success providing leadership training for technical professionals in science, research, engineering, IT and software development.

He regularly consults on strategic planning, business intelligence, teambuilding/ partnering and leadership development. Clients include pharmaceutical companies, IT departments, research and development laboratories, colleges and universities, hospitals and health care organizations, professional firms and non-profit organizations, defense corporations and government agencies.

Dr. Ronco is an international expert on teambuilding and partnering. His teambuilding and partnering clients include drug development project teams, global project teams, outsourcing-client partnering, IT- user partnering, mergers and acquisitions. Author of *The Partnering Solution* (Career Press, 2005) Dr. Ronco has led over a hundred successful partnering projects in design and construction, outsourcing, strategic alliances, mergers, sales, support and between departments. See www.thepartneringsolution.com for excerpts, interviews, case examples and additional details.

In addition to the leadership training he does in organizations, Dr. Ronco also regularly runs external Leaders Circle programs. He founded the Leaders Circle program 10 years ago, a small group leadership development program consisting of monthly half-day seminars for a year. Over 100 managers and professionals have participated, and with consistently “Excellent” evaluations and lasting results.

Dr. Ronco has written numerous articles on leadership, strategic planning and partnering. He wrote *Food Co-Ops* and *Jobs* (both published by Beacon Press) and, with Lisa Peattie, *Making Work* (Plenum Press).

Formerly a professor in the MBA program at Northeastern University, Dr. Ronco earned his B.A. at Rutgers University, his Ed.M. at the Harvard Graduate School of Education and his Ph.D. in Urban Planning and Education at the Massachusetts Institute of Technology.