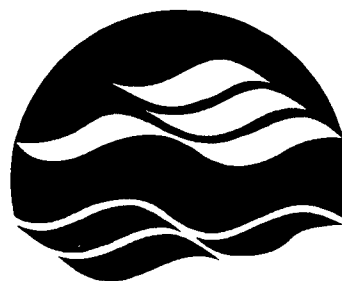


DEVELOPMENT RESOURCE GUIDE

R&D Management

National Water Research Institute

ENVIRONMENT CANADA



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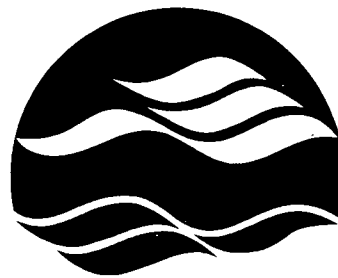
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RECHERCHE SUR LES EAUX

Developed by the Ecosystem Science Directorate, Environmental Conservation Service
in conjunction with Human Resources Branch - Ontario Region

and

Hay Management Consultants

April 1998

FOREWORD

R&D organizations exist on the edge of the future. The challenge for R&D managers is to nurture and maintain the creative tension within the organization, while at the same time focusing on the research issues of today. Ensuring the right mix of activities, taking the right risks, and having the courage and confidence to be at the forefront of thinking are only some of the challenges facing the R&D manager.

The core competencies for R&D management identified in this guide have been developed by R&D managers for the R&D managers of the future. Whether managing a group or managing one's own research, this resource development guide is a tool to assist those wanting to refine and develop their skills in the field of research management.

The authors wish to acknowledge the contribution of the Project Chiefs, Branch Directors, and the Executive Director at the National Water Research Institute of Environment Canada for valuable suggestions relating to the overall format and content of the document.

INTRODUCTION

Giving priority to your own continuous learning and development is key to success in any research organization. Regardless of your level of competence in a given area of development, take the opportunity to explore new information, acquire new skills and benefit new experiences.

This document is intended to provide you with information that will help you embark on a planned and self-directed effort to refine and develop competencies identified for successful R&D management. It is not intended to serve as an overall plan for personal development. The Development Resource Guide is intended to serve as a starting point in a self-directed competency plan. It is a tool to help you develop in your competencies; it is not an all-inclusive list of everything you can do.

ONLY FOCUS ON DEVELOPING ONE COMPETENCY

The Guide covers all of the important competencies for R&D management, however, there is no need (and no point) in trying to develop all the competencies at once. Based on the results from your Competency Portfolio or development feedback from other sources, pick one or two competencies that will be most helpful for you to work on.

WHAT'S IN THE DEVELOPMENT RESOURCE GUIDE

For each competency, the Guide gives you:

- a definition of the competency with examples of what it is and what it isn't;
- suggested activities and resources.

DEVELOPING A COMPETENCY

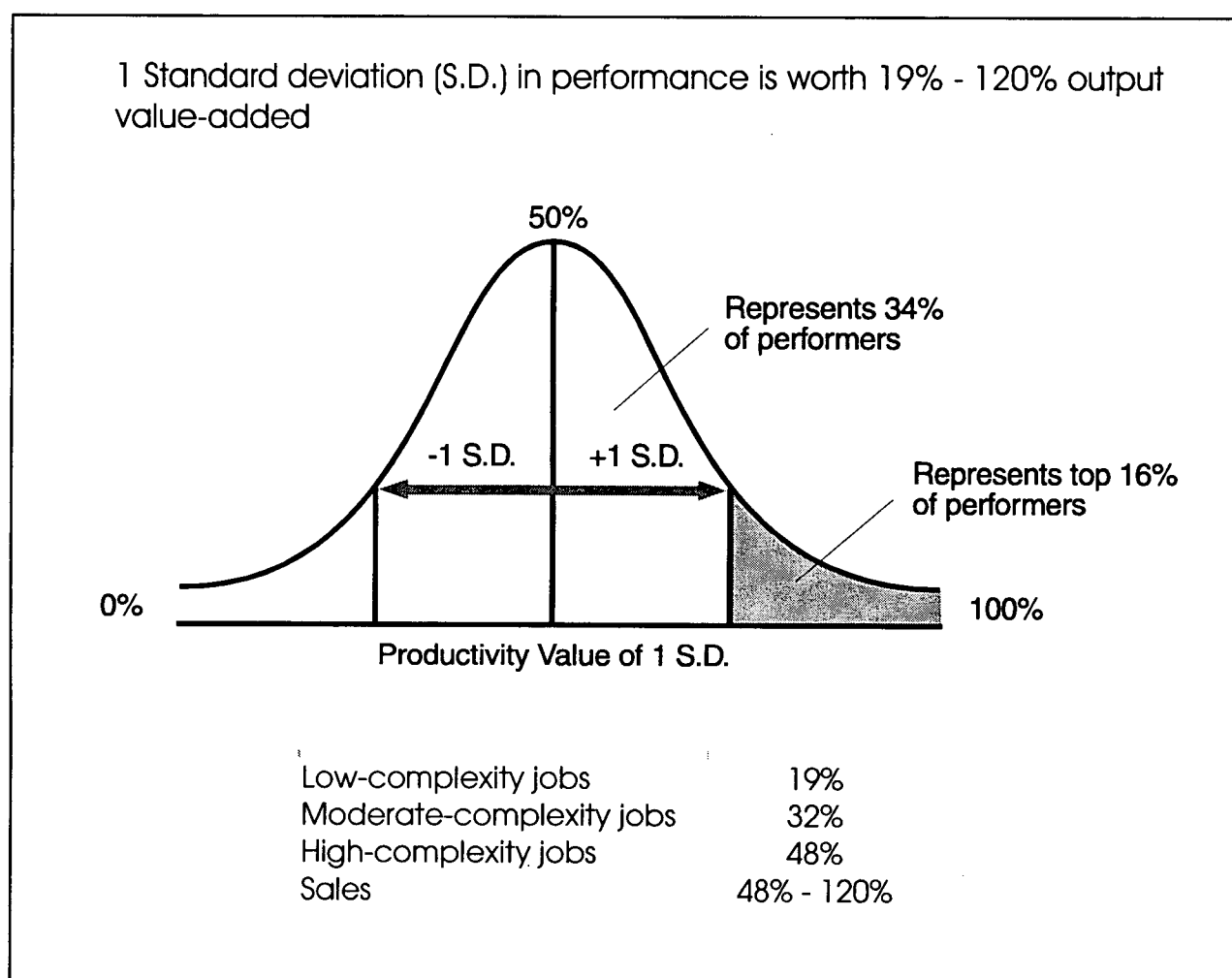
Developing a competency is a step-by-step process and is every employee's primary responsibility. It must be pointed out that the development guide is provided as a roadmap to improving competency demonstration. The basic steps useful in developing a competency are recognizing and understanding the competency, seeing how you could apply it, experimenting and practicing, and measuring one's own performance.

For your reference, HayMcBer's approach to competencies and relevant research and information on how to use competencies for development purposes are included on the following page.

THE CONCEPT OF COMPETENCE

In the past, it was assumed that a person's intelligence or degree of knowledge and skill reflected how well they performed in a job. Candidates were recruited and selected based on their educational achievements, how they performed on standardized tests of intelligence, reference checks and/or the "gut feel" of interviewers. However, reference checks are by their very nature unreliable and in today's legislative environment actively avoided. The "gut feel" of interviewers has not only proven undependable but also biased and discriminatory in nature. Furthermore, research shows that intelligence tests and educational performance (see McClelland¹ 1973), do not significantly predict successful performance within the job.

In all jobs, some employees perform better than others (that is, performance is normally distributed). Furthermore, it has been proven that the difference attributable to more successful performance is quite valuable to an organization. Superior, or more successful performers contribute between 19 and 120 percent more than average performers. (See Figure 1, below).²



¹ "Testing for Competence Rather Than for 'Intelligence'," from *American Psychologist* Vol. 28, No. 1, pp. 1-14, January 1973

² J.E. Hunter, F.L. Schmidt, and M.K. Judiesch, "Individual Differences in Output quality as a Function of Job Complexity," *Journal of Applied Psychology* 75 (1990): 28-42

The more complex the job, the greater the value added by superior performers. In complex jobs, top performers are worth a minimum of 48% more than average job holders, because these superior performers do the work of 1.48 average workers. In high-leverage jobs (e.g. executives), the value added by the best performers is even better.

Given that the output of superior performers is so valuable, managers and human resource professionals have always searched for such competencies as “initiative” and “communication skills” in persons that they hired. How they assessed these competencies, and whether these particular competencies were actually related to successful performance on the job, remained uncertain. The modern competency movement in American industrial-organizational psychology dates from the late 1960s and early 1970s. It was then that Dave McClelland, a psychologist based at Harvard University, set out on an active search to systematically define “competency” variables which *did* predict job performance and which were not biased by race, sex or socioeconomic factors.

Hay-McBer’s Competency Based Methodology

The results of his research and the systematic method for assessing competencies that he developed form the basis of Hay-McBer’s competency-based methodology.

The following two principles form the basis of Hay-McBer’s Competency Based Methodology:

- A. **Use of criterion samples:** People who are *already* displaying superior performance in the job or relevant real-life situations are compared systematically with persons less successful in order to identify those characteristics distinctly associated with success;
- B. **Identification of operant thoughts and behaviours that are causally related to these successful outcomes:** To ensure relevance, competency modeling proposes that the best predictor of what a person can and will do in present and future situations is not what they say they will do in a proposed situation but, *what he or she has actually done in similar past situations*. Espoused theories of behaviour that result from respondent-type interview or assessment methods do not accurately reflect what a person will actually do in a given situation.

Competencies identified in this way are context-sensitive, e.g., describe what scientists actually do in their own organization and culture, not what Western psychological or management theories say should be needed for success. Various systematic methods have been developed for reliable assessment and validation of these competencies. Furthermore, when the competencies of superior performers who already display valued behaviour are compared with the competencies of average performers, a competency based job model can be created that then serves as the template for superior performance within the organization or the job.

Research Findings

Twenty-five years of competency research based on the above principles have proven that superior job holders do different things in different ways than average job holders and that these differences not only result in a large differential in bottom-line results for an organization, but can be assessed in a systematic way. McClelland called these behavioural and motivational differences "Competencies" and defined them as follows:

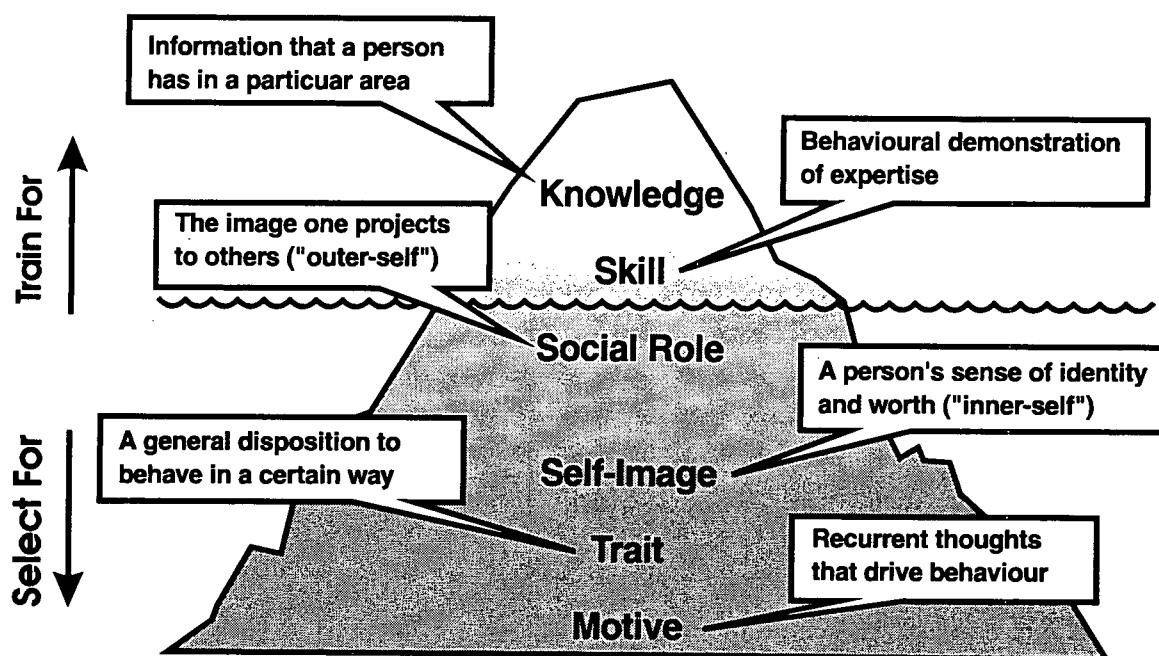
A competency is any motive, attitude, skill, knowledge, behaviour or other personal characteristic that is essential to perform the job (**a threshold competency**), or that differentiates average from superior performers (**a differentiating competency**). In other words, a competency is whatever outstanding performers think or do, more often, in more situations, and with better results than average performers, and that is proven reliably by systematic methods.

There are five types of competency characteristics:

- | | |
|----------------------|---|
| Skill: | The ability to perform a specific physical or mental task. |
| Knowledge: | Information a person has in specific content areas. (e.g., facts or procedures) |
| Self-Concept: | A person's attitudes, values, or self-image. Usually measured by respondent tests which ask what people value or are interested in doing. |
| Traits: | Physical characteristics and consistent responses to situations or information. (e.g., self confidence, self control) |
| Motives: | The things a person consistently thinks about or wants that cause action. Motives drive, direct and select behaviour toward certain actions and away from others. (e.g., power, need for achievement) |

The type or level of a competency has practical implications for human resource planning. Many companies select for and manage performance on the basis of knowledge and skill competencies alone. These are normally the most visible characteristics of people and those that are relatively easy to develop. For example, people are selected for their expertise in a certain technical area, their ability to use an instrument, or an educational degree that they have.

Self-concept, trait and motive competencies, those that are more central to personality, less easy to observe, more difficult to develop and directly related to successful performance in the job, are often overlooked in the various human resource applications of an organization.



Using Competencies for Development

The type or level of a competency needed has practical implications for human resource planning. Core competencies, such as motives and traits are hard to develop; therefore it is most cost effective to select candidates who already possess these characteristics. Peripheral knowledge and skill competencies are relatively easy to develop and training is the most cost effective way to ensure these capabilities. Self-concept, attitude, and value competencies can be changed, albeit with more time and difficulty; these attributes are most cost effectively addressed by training through developmental job assignments.

Competency based development training is based upon gaps between the person's competencies and those of their job's competency model. Employees appraised as lacking in a specific competency can be directed to a specific development activity designed to teach them the missing competency to improve their performance in their current job and/or prepare them to advance to higher-level jobs in the future.

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Conceptual Thinking

Over the coming years, it will be critical for the Research Community in the Federal Government to ensure its ability to provide the science necessary to meet evolving policy and program needs. To achieve this end, the R&D Community must effectively manage complex information while demonstrating the commitment and knowledge necessary to maintain its leading position at the cutting edge of scientific issues.

Conceptual Thinking is the ability to identify patterns or connections that are not obviously related and to identify key or underlying issues in complex situations. This competency is crucial for success in an R&D environment where there is a continuous need to gather a wide range of information, recognize emerging trends and issues and build a coherent picture of future research directions. Conceptual thinking includes using creativity, inductive reasoning, and intuitive processes that lead to potential solutions or viable alternatives that may not initially be obviously related or at first identified. At the Research Scientist level, conceptual thinking involves seeing trends and patterns in other areas of science that can be applied to one's own discipline. At the managerial level, it involves synthesizing scientific information into concepts that can be used to explain the significance of scientific results to non-scientists. The results can then form the basis of policy and program decisions.

People with this competency assemble ideas, issues and observations into a clear and useful explanation. They do not treat each new problem or occurrence as a unique event; instead they use their learning, training, and understanding of the situation to select conceptual models that will advance the development of solutions. At higher levels, science managers demonstrate leadership in thinking and innovation by creating new concepts that clearly influence science policy.

IT IS...	IT ISN'T...
⇒ integrating and applying different ideas and approaches to accomplish a goal	⇒ trying to force-fit a previously applied approach without considering alternatives
⇒ coming up with a new or different way of understanding, describing or explaining a situation or opportunity	⇒ using the same ideas or concepts to describe or explain a different situation or event
⇒ actively using a variety of sources of information to help advance an area of responsibility	⇒ ignoring other avenues for new ideas or concepts when addressing issues or areas of concern
⇒ recognizing and adapting new concepts that advance the development of science	⇒ assuming that any solution will move science policies forward and forcefitting the solution to fit the situation
⇒ applying concepts that are new and different to advance corporate direction	⇒ believing the old way is the best way, and that new ways of thinking will have a negative impact

People Recognized as Leaders in Conceptual Thinking:

Brainstorm solutions to problems to make a decision. Leaders in conceptual thinking recognize that there are often multiple solutions to a single problem. They make use of others' thoughts to "brainstorm" solutions to problems. Furthermore, they pull together ideas and thoughts from their own experiences. They use their science knowledge and expertise to solve a problem, (e.g., past experience, theories, methods, and models). They identify many possible solutions without evaluating or critiquing ideas until they have exhausted all possible alternatives in the process. They think about possible solutions with the end in mind, (e.g., which ideas will have the highest probability of success given program constraints such as time, money, human resources). They put forward the best alternatives and make a decision based on the input of others, their knowledge and expertise, and how everything fits together.

Make boundaries permeable. Strong conceptual thinkers can apply concepts and ideas from unrelated disciplines to develop new insights to current problems. They look for ideas and concepts beyond their own working environment, and do not try to narrow the focus on what exists around them. For example, they look at other disciplines and think about an area of interest such as politics, history, or economics to broaden their focus. They move beyond the boundaries to look for ideas that could help them solve their current problem. They think beyond the immediate scope of a project or problem to bring more

substance to their approach. They ensure the ideas they use make sense and fit the situation (e.g., they ask for input about their ideas from others).

Examine innovative approaches used by other research organizations. Conceptual thinkers are people who consider other approaches and look for new advances in technology, research methods, customer service, and public information. They expose themselves to other disciplines and sources of information such as attending conferences and visiting labs to learn about different approaches, and how others are working. They think about how these approaches could fit within the organization and the science environment. Conceptual thinkers incorporate the most promising of these approaches into their own management policies.

Explore paradigms. When positioning their ideas, conceptual thinkers often find it useful to first rationalize their thinking through various paradigms reflecting, for example, on such parameters as stakeholder interests or social and economic conditions. As a leader, they prepare for the inevitable and are open to other approaches. Approaches could include preparing a business case for the implementation of a new idea, addressing the economic potential of a new strategic direction or preparing a forecast of the value of a new initiative.

Make a conscious decision to seek out new perspectives. Conceptual thinkers seek the input of colleagues in the broader R&D community whose approach or theoretical background differs from their own. They discuss current scientific or management issues that they are attempting to resolve and find out how colleagues have approached similar issues. They look for new patterns that others have observed and consider the use of different models or ways of interpreting situations that differ from their own perspective.

Be open to change. Conceptual thinkers are able to adapt to the situation and are willing to experiment with new ideas or approaches. They recognize that there are a number of ways to test an idea or concept. They ask colleagues for feedback and document any key learnings or issues. Conceptual thinkers never exclude the possibility that there may be changes to their own idea or concept. They know that the purpose of testing a new idea or concept is to see whether or not it is viable and if there is merit for proceeding further. They align their idea or approach with other initiatives in the organization, and think about how it fits into the 'bigger picture'.

Look for roadblocks in existing processes and procedures. Removing roadblocks sometimes creates a far more efficient process. Conceptual thinkers anticipate the requirements and constraints inherent in processes and procedures then identify potential roadblocks and sandbags. They devise ways of circumventing or eliminating those roadblocks and implement the changes. They look for opportunities where similar processes and procedures have been implemented and find out what roadblocks were encountered. (This activity can also be found in Strategic Thinking.)

Canvas the problem in “mosaic form”. Before breaking down a problem into smaller parts, conceptual thinkers determine whether the problem will impact other areas in the organization. They take a step back and think about where the problem fits in to larger projects and how it will look. They look for discrepancies, patterns, and missing pieces. They determine what needs to happen next to advance the project and solve the problem.

Work with leading edge conceptual thinkers. Strong conceptual thinkers look for opportunities to work with colleagues who are at the forefront of new technology and model development. They use these opportunities to gain insight into new ways of thinking and sharpening their own conceptual thinking skills. They work with people who will stretch them to the limits of their own ideas, encourage them to examine their assumptions and develop new ways of looking at the old problems.

Suggested Resources

Play a Game of Chess. Chess will help develop conceptual thinking skills. Players anticipate their opponent’s moves and the next moves to take. They develop a strategy on how to play the game and where each move fits into winning. Conceptual thinkers are able to recognize the patterns and trends based on past experiences. They use their experience and learnings from previous games and apply it to the game they are currently playing.

Books, such as;

Thriving on Chaos, by Tom Peters, 1997. This book discusses the idea that change is constant, that the future is networked, outsourcing organizations, that innovation and creativity will be important and how to build this in people.

The Ideal Problem Solver: A Guide For Improving Thinking: Learning and Creativity, by John Bransford (New York, New York: W.H. Freeman, 1993). This book incorporates a wealth of recent research on thinking and creativity. A detailed framework for tackling problems is outlined.

Future Edge, by Joel Arthur Barker (William Marrow & company, Inc. New York, 1992). The author discusses spotting trends, adapting to change and dealing with problems to improve results.

The Mind’s Best Work, by D. Perkins, (Harvard University Press, 1981). This book, by a member of the research team project zero, describes how people think conceptually and creatively.

How Much Can Intelligence be Increased?, by Douglas Detterman and Robert Sternberg (eds), (Norwood, N.J. Ablex, 1982). The authors provide a comprehensive review of the research on increasing intelligence.

Breakthrough Thinking: Why We Must Change the Way We Solve Problems, and the Seven Principles to Achieve This, by Gerald Nadir and Shozo Hibono, (Rocklin, CA: Prima Publishing and Communication, 1993). This book presents some novel ideas on how to approach problems based on the thought processes of great thinkers. It includes exercises you can do to practice their suggested approach.

Courses, such as;

Lateral Thinking Workshop offered by MICA (416) 366-6422. This course uses Dr. de Bono's proven lateral thinking tools, to create new and practical ideas and find and build on the concept behind one idea to create even more ideas.

Six Thinking Hats Workshop offered by MICA (416) 366-6422. This seminar separates the different types of thinking-emotions from facts, positive from negative, critical from creative. The objective is to generate more and better ideas while improving teamwork.

Critical Thinking: New Paradigm for Peak Performance offered by Canadian Management Centre (416) 214-5678. This workshop introduces and explores the concept of critical thinking.

Related Competencies:

Often working on one competency can help to develop another. Refer to *Strategic Thinking* for additional developmental activities.

Ethics and Values

As the R&D community changes to meet the challenges of the future, the actions of R&D managers in the Federal Government will need to be consistent and reflect the changing values and principles integral to the culture and beliefs of the public service. Leaders will need to be clear about what they believe in and what they value. There are no clear demands for expediency or personal interest. To survive within this competitive environment and be respected by colleagues and peers, leaders will need to live by their words and actions.

Ethics in any work environment require that an individual be committed to the set of basic values that underlie the organization. This commitment is accomplished by encouraging the open expression of individual values while working to build a common culture of values, principles and attitudes that represent those of the organization. In the Federal Government, all employees are expected to know and operate within the ethical guidelines prescribed for public service employees (e.g., Conflict of Interest and Post-Employment Code, etc.).

Ethics and Values involves taking actions that uphold and advance the ethical and social norms of the organization, treating people fairly and maintaining consistent values and performance standards. At the Research Scientist level, individuals demonstrate leadership by ensuring that social and ethical values are honoured in a group. At the managerial level, individuals honour and follow through on commitments to make visible and meaningful changes that advance the social and ethical norms of the organization.

People with this competency consistently demonstrate their integrity and credibility through speech and action. They make a concrete effort to be fair to others in spite of circumstances. They provide honest feedback to others, particularly to those in difficult work situations. At higher levels, people with this competency follow through on commitments and establish a climate of support and fairness.

IT IS...	IT ISN'T...
⇒ providing honest feedback even in difficult situations	⇒ being insincere to avoid an uncomfortable situation
⇒ recognizing own mistakes and openly admitting them	⇒ being defensive about one's mistakes and trying to place the fault on others
⇒ continuously making an effort to follow through on commitments	⇒ neglecting commitments and falling back on promises
⇒ taking on a leadership role in ensuring strategic actions are aligned with the values and ethics of the organization	⇒ disregarding organizational ethics and norms just to meet your objectives

People Recognized as Leaders in Ethics and Values:

Apply ethical standards in group decision-making. In a group, ethical decision makers highlight the issues that have possible long and short-term consequences. They ask questions, such as: Does this situation present a potential risk or danger to colleagues, clients, or partners? What advice would I be comfortable giving if another group came to me with this same issue? They consider different stakeholders' perspectives, (e.g., partners, the local community, etc.), as part of the decision-making process. They take steps to ensure that the implementation or management of issues meet the standards discussed by the group, as appropriate.

Practice saying "I don't know" when they don't know. Leaders in Ethics and Values are honest with themselves and others in recognizing the limits of their knowledge. They do not ignore cases where they were wrong about something. They learn from these instances to understand their limits. They develop their ability to be honest about what they do not know by making a point of admitting "I don't know" when the opportunity arises. They think about, and practice, what they will say so they can be genuine without undermining their role as a leader.

Ensure information is communicated properly. Leaders in Ethics and Values make sure they announce changes or other significant events involving the operations or projects others are working on. They ensure others do not hear things through the "grapevine" first. Where they are expected to carry forward messages through the organization, they ensure the message is consistent. They may organize a script or point form information packages. For issues of highly confidential nature, it is appropriate to say that leaders in Ethics and Values are not at liberty to talk about certain things.

Develop their credibility. Leaders in Ethics and Values realize it takes years to develop their credibility. They recognize that having ethics and values is essential for moving initiatives forward. They realize they must regularly check whether they are actually acting in ways that are congruent with those values, and with those of the Public Service (reference Developmental Recommendations and Resources cited below).

Build a strong set of personal values. Leaders in Ethics and Values spend time building and clarifying their own personal values. This is not something to be done only on a coffee break or even on weekends. It is a sustained effort over the years to find those values they can truly commit to. The trick is not so much feeling a commitment to values but being able to live by the consequences. For example, if leaders find they are unable to live by their espoused values, they take steps to redefine them, (e.g., it's not credible to preach about the importance of fitness if you never find time to go to the gym). When leaders actually live their values they have achieved a high level of the Ethics and Values competency.

Find ways to remind themselves they are a leader. Leaders in Ethics and Values often find themselves in positions where they are involved in establishing standards by which not only themselves but others will be judged. Their words and actions are watched very closely and may have meaning for others far beyond what they have intended. They find a way to remind themselves of the importance of their role as a leader. They regularly set aside time to reflect on their leadership role and impact.

Give bad news in a frank manner. Leaders in Ethics and Values tell the truth even when the truth is difficult and may not be well received, (e.g., resources to a project did not come through). They are alert to situations involving bad news and use them as opportunities to be frank and open. They are sensitive to the consequences on others and explain the reasons for decisions and actions.

Suggested Resources

Reports, such as;

Developmental Recommendations and Resources, Public Service Commission of Canada.

Policies, such as;

Conflict of Interest and Post-Employment Policy, available on Canada's Infolane (select Human Resources icon).

Environment Canada Code of Conduct, available on Canada's Infolane (select Human Resources icon).

Oath of Office and Secrecy, (reference Public Service Employment Act - Part III, Section 23 and Schedule III, Section 23).

Books, such as;

The Power of Ethical Management, by Kenneth Blanchard & Norman Pearle (William Morrow, 1988) (Also available on audiocassette). This book is a practical guide to the tough ethical questions faced by today's managers. It offers tools for building a caring, ethical environment inside any organization.

The Power of Ethical Persuasion, by Tom Rusk (Penguin Books, 1993). In this book, the author applies the ethical principals of respect, understanding, caring and fairness - which together create the foundation for quality in personal life and business - to high-stake conversations.

Credibility: How Leaders Gain and Lose It, Why People Demand It, by James M. Kouzes and Barry Posner (Jossey-Bass, 1993). This is a guide to help managers understand the fundamental importance of credibility for building personal and organizational success and for fostering trust within work, family, and the community.

Ethical Dimensions of Leadership by Kanungo and Mendonca (Sage, 1996).

Leadership Is An Art, by M. De Pree (Dell Publishing, 1991).

Core Values in the Public Service, published by the Institute of Public Administration of Canada (1993).

Principle Centred Leadership: Strategies for Personal and Professional Effectiveness, by Stephen Covey (Distican, Inc., 1992). In this book, Covey takes an inspirational approach in helping people find inner principles as a basis for management and life. Having strong inner principles will increase your Ethics and Values.

The Tate Report: The Discussion Paper on Values and Ethics in the Public Service, <http://publiservice.tbs-sct.gc.ca/> (under the La Releve icon - select Documents).

Related Competencies:

Often working on one competency can help to develop another. Refer to *Team Leadership, Partnering and Self Confidence* for additional developmental activities.

Impact and Influence

Strong interpersonal skills are essential to the ability of science managers to persuade, motivate, and develop constructive working relationships both internally (at all levels) and externally. The ability to draw on a variety of people and adopt win-win approaches will have an increasing impact on results as partnerships and working through others becomes a prime vehicle for delivery of research objectives.

Impact and Influence is taking appropriate action to achieve objectives or end results by influencing events, issues, and the persons involved. At the Research Scientist level, individuals anticipate and prepare for a specific opportunity or problem that is not always obvious to others which will definitely impact the situation. This is particularly effective where the impact is positive and can lead to a win-win situation. At the managerial level, impact involves developing and implementing various influencing strategies which successfully impact multiple stakeholders both internal and external to the scientific community.

People with this competency develop and implement various influencing strategies which successfully impact multiple stakeholders. At higher levels, they represent the interests of the broader R&D community to support corporate policy and program decisions and outcomes for the long term.

<i>IT IS...</i>	<i>IT ISN'T...</i>
⇒ taking actions or adopting a win-win approach that looks promising to others	⇒ believing your idea will quickly persuade others without thinking of their needs
⇒ considering specific situations or areas of potential resistance and identifying strategies that will achieve the desired outcome	⇒ using the same argument over and over ("I told them again and again but they just didn't get it")
⇒ drawing on a variety of people, including outside experts, to set the stage for getting your ideas accepted	⇒ relying only on their formal authority to make things happen
⇒ presenting the points that will have the most impact with enthusiasm, confidence and credibility	⇒ using a standard influence approach with every staff member regardless of their personal traits and needs
⇒ thinking of the interests of the department and representing to multiple stakeholders for the long term	⇒ thinking exclusively of the short term

People Recognized as Leaders in Impact and Influence:

Develop a strategy to influence others. Leaders in Impact and Influence invest time in developing a strategy to influence others. They think about the impact they need to make to win over the person(s) they are wanting to influence. They 'systematically' plan out their strategy and anticipate any obstacles or challenges that could happen. They think ahead of next steps (A leads to B leads to C). They come up with alternative approaches to get buy in and support. They look for a win-win outcome.

Think about their audience. Strong influencers make sure they understand the perspective of the person(s) they are trying to influence. They listen to their audience, check for understanding, and clarify expectations. They mentally review the audience's strengths, problems, and interests. They think of several alternatives and pick the ones that will work best. They consider the ideal outcome and the likely responses the person will have to their proposals. Some actually prepare written objectives and incorporate them into a formal action plan.

Use a "trial balloon" before presenting an important issue or idea. Leaders in Impact and Influence test out their ideas and approach before presenting it to the party they need to influence. They brainstorm with people to get a broader view on the idea or issue they want to present to their audience. They take note of the responses and may change the proposal accordingly. When receiving feedback, they consider the audience they need to influence and which approach will work best.

Think of alternative actions to change the outcome of a particular problem. Leaders in Impact and

Influence examine alternatives that would have better served the needs of a particular problem. When an action fails, they analyze the outcomes of each action to understand why an attempt failed. They identify those actions they thought would have had the highest probability of successfully remedying the problem. When confronted with a similar situation in the future, they make an effort to implement these new actions accordingly.

Reflect how others buy into new policy change. Strong influencers recall which actions they took to get others to buy into a new initiative. They reflect on past experiences when they were not able to influence people. They track actions and the challenges they faced to get others to support their idea. They analyze how they got others to buy-into their idea and why they were successful or not successful. They keep track of the success and reflect on less positive outcomes.

Create win-win solutions. Leaders in Impact and Influence identify a mutually beneficial opportunity or difficult situation and think of how the outcome could satisfy both parties. They identify the factors or events to create a win-win solution, find out which people will be impacted by the situation and the difficulties they will encounter. They think of ways to improve their own method of creating beneficial solutions and incorporate these ideas when confronted with similar situations.

Conduct a strategic analysis. Influential leaders look at a variety of areas to develop a strategic analysis. They will take a conceptualization and develop a plan to implement and educate others. They are receptive to a variety of avenues to achieve their objectives and develop a range of contingency and back-up plans. For example, they identify leaders in action and decision-making within the community, assess community expectations, identify barriers to effectively meet expectations and, through this analysis, are able to develop actions that will lead to improvement and achievement of their long-term goal. They get buy-in and support for action plans from the leaders and decision makers. (This activity can also be found in Strategic Thinking).

Broaden their sphere of reference. Leaders in Impact and Influence build relationships and support for the future. They position themselves to get to know as many people as possible so that they can learn new approaches, (e.g., they attend a conference, network, etc.). They seek out committee work that gives them a greater inventory of problems and exposure to what is going on in the organization. They use this information accordingly and gain influence by meeting with people to discuss the problem.

Build support to influence over the long-term. Leaders in Impact and Influence work with a long-term horizon. They are realistic and assess the readiness of others to change. They recognize it can take years for a good idea to percolate throughout a large organization. They are able to compartmentalize goals and are aware that successful influence efforts take time and repeated effort. They do not give up on good ideas if there seems to be little progress. They identify the key people they will need to influence in order to achieve their goal, and determine the resources they will need to effectively influence these people, (e.g., scientific knowledge, organizational support, time, etc.). They keep track of the difficulties they encounter and the success they achieve.

Lead by example. Leaders in Impact and Influence communicate the goals and objectives they want to achieve to their audience. They develop a high standard of ethics and values to get others to buy-into their objectives. As leaders, they conduct themselves according to how they want to be treated and how they want others to act. They exemplify the behaviour they want others to follow. They “walk the talk”.

Suggested Resources

Books, such as;

Building Strategic Relationships, by William Bergquist, Jule Betwee & David Muel (Jossey-Bass Publishers, 1995). This book shows how successful alliances are launched, developed, and concluded within the corporate world and between corporate entities.

Getting Together: Building Relationships As We Negotiate, by Roger Fisher & Scott Brown (Penguin Books, 1988). The authors offer a straightforward approach to creating relationships that can deal with difficulties as they arise. They take you step-by-step through initiating, negotiating and sustaining enduring relationships.

The Manager as Negotiator, by David Lax & James Sebenius (The Free Press, 1986). This book helps executives develop a sophisticated approach to negotiation, and offers a new and compelling vision of the successful manager as a strong, often subtle, negotiator.

Getting To Yes: Negotiating Agreement Without Giving In, by Roger Fisher and William L. Ury (Penguin Books, 1994). This book provides direct methods for negotiating in personal and work-related situations. It also provides helpful techniques for resolving conflict.

Seven Habits of Highly Effective Leadership, by Stephen Covey (Distican, 1990). This book provides direction on how to achieve personal and professional effectiveness. It is ideal to develop relationships and influence people.

Power: the Inner Experience, by David McClelland (Irvington Publishers, 1975). This book gives insight into the applications of influence motivation and the thinking patterns that can underlie it.

Courses, such as;

Human Interaction Laboratory, NTL Institute for Applied Behavioural Science [1-800-777-5227]. This laboratory is for individuals interested in learning more about themselves and how they relate to others, and in fine-tuning their personal styles of interaction.

Negotiating for Success in Business, York University Executive Development [(416) 736-5079]. In this workshop, participants learn how to analyze their own negotiating style, develop a practical understanding of effective negotiating behaviours, and improve their ability to plan and conduct successful day-to-day negotiations in every day situations.

Related Competencies:

Often working on one competency can help to develop another. Refer to *Results Orientation* and *Self Confidence* for additional developmental activities.

Partnering

Effective partnering will be an important factor for success for researchers and those managing R&D programs. Future partnerships will be a critical ingredient to ensuring capacity, maintaining cutting edge science and effectively utilizing and maximizing the organization's resource base. Paramount in successful partnering is maintaining a clear understanding of the direction and mandate of the organization and selecting only those partners with a shared vision/mission.

Partnering is the ability to interact strategically with individuals and groups internal and external to the organization. It involves interacting with others in ways that build a network of relationships and which advance the work of the organization. Partnering develops productive working relationships to achieve group and organizational goals. The partnership is seen as key to securing future mutually beneficial opportunities. R&D managers deliberately seek out relationships with internal and external partners and build and maintain a network of support to help attain organizational goals.

People with this competency genuinely value others' expertise and respond to others' ideas and concerns. They see partnerships usually as a means to an end -- as a key to securing mutual opportunities with others. They often work internally to alter perceptions and objectives in order to be consistent with larger group interests. At higher levels, they build and maintain a network of support with stakeholders to help attain organizational goals.

<i>IT IS...</i>	<i>IT ISN'T...</i>
⇒ seeking the ideas and concerns of colleagues for mutual benefit	⇒ ignoring the opinions and ideas of your colleagues and believing your ideas are always the best ones
⇒ establishing a long-term relationship with internal and external stakeholders	⇒ focusing on the short-term with a stakeholder to build immediate project support without considering the long-term implications
⇒ initiating and supporting the development of strategic alliances within one's area of responsibility	⇒ focusing only on technical or scientific day-to-day aspects of one's work
⇒ developing a network of support with stakeholders to help attain organizational goals	⇒ contacting stakeholders only when you need to solve a problem or gather information

People Recognized as Leaders in Partnering:

Develop a network. Leaders in Partnering build a large network to develop their expertise and improve the visibility of their organization. They identify individuals whose expertise they can use to develop their own area or that of the organization as a whole. They exchange ideas and expertise on a regular basis to keep up to date on industry trends, patterns and changes.

Initiate and support relationships. Leaders in Partnering bring colleagues (internal or external to the organization) together to generate ideas aimed at supporting strategic alliances, (e.g., funding for a research project, a piece of equipment or student resources). The combination of their partnership or alliance exceeds the value of individual effort if they were to initiate the work on their own. They evaluate the probability of success or feasibility of each alternative as a group vs. as a sole practitioner. They determine an action plan that will help incorporate the best methods and ideas to achieve their research results.

Get to know the people they are working with. Leaders in Partnering get to know the people before working on a project together. They ask questions such as: Am I comfortable working with this partner? What different strengths do they bring to the project and how might one leverage those strengths? Is it the right fit? They communicate through phone, email, or meetings to get to know prospective partners. They screen out partners who are not a match or gather additional information about people they are unsure of or do not know about from other sources (internal or external) of the organization. There are times when leaders may have to commence a partnership when they do not

know very much about their partner. When this occurs, they proceed with caution when they engage in ideas and commit to funding.

Ensure benefits are clearly understood. Leaders in Partnering make sure the benefits of the relationship are clearly stated and mutually understood. They communicate the goals and objectives of the partnership and how they see the partnership developing. They ask for input and listen to the other party to clarify their expectations and address any concerns. They develop a plan to do what is necessary to ensure the support they need from each key person.

When implementing a new strategy or major initiative, consider the impact on all those involved. Leaders in Partnering identify the individuals or groups impacted in a new strategy or initiative and keep them informed about the process. Whenever possible, they make a personal visit to research partners. They talk to them about what is going on, tell them about the strategy and assess the impact of major initiatives. Leaders in Partnering actively solicit the advice and commitment of research partners before implementing the new strategy or initiative. They develop a plan to do what is necessary to ensure the support they need from each key person.

Keep regular contacts. Leaders in Partnering make sure they keep up with the people they have met through conferences, meetings, and visits. They meet regularly to find out what is going on within the R&D community, as well as any social, economic or political forces that will impact their organization. They discuss new opportunities, initiatives, and approaches to science management. They review their achievements and challenges.

Develop informal partnerships. Leaders in Partnering work with others on a project-by-project basis to enhance the quality of their research work. They develop partnerships with external sources, (e.g., universities, organizations in the public sector), and access those sources when they need to pursue research funding, or need access to a specialized field or instrumentation. They combine resources so that both parties achieve a win-win outcome. They jointly plan future activities and provide guidance and support when needed.

Suggested Resources

Books, such as;

Getting Together: Building Relationships as We Negotiate, by Roger Fisher and Scott Brown (Penguin Books, 1988). In this book, the authors offer a straight forward approach to creating relationships that can deal with difficulties as they arise. They take you step-by-step through initiating, negotiating, and sustaining enduring relationships.

Building Strategic Relationships, William Bergquist, Jul Betwee, and David Meuel. (Jossey-Bass Publishers, 1995). This book shows how successful alliances are launched, developed, and concluded - within the corporate world and between corporate entities.

Networking Smart, Wayne E. Baker (McGraw-Hill, 1994). This book carries networking several steps farther than the original concept. It expands to networking their people, their department, and their company.

How to Win Friends and Influence People, by Dale Carnegie (Distican, 1990). This is the classic book on developing relationships with others.

Neanderthals at Work, by Albert Bernstein (Wiley, 1996). This is a book develops an understanding of groups, behaviours and relationships between people. It explains that people need to understand what others are thinking and make adjustments to fit the culture.

Technology exchange in the information age: A guide to successful cooperative R&D partnerships, by J. Lesko (Battelle Press, 1997).

Courses, such as;

Amos, Stephanie. **Learning from each other: university - industry collaboration in the continuing education of scientists and engineers**: proceedings of a workshop held in Toronto on 24-25 November 1986. Ottawa Council of Canada, 1987. (Available from CISTI).

Gamman, J.K. **Overcoming obstacles in Environmental Policymaking: creating partnerships through mediation**. Stat Univ. of New York Press, 1994 (Amazon. Com).

Networking for science and technology in local government: proceedings of the first annual Innovation Group Conference, March 1977/sponsored by the National Science Foundation, Washington D.C. NSF, 1977. (Available from National library).

Powerful Partnerships. Ottawa: Natural Sciences and Engineering Research Council, 1992 (Available from CISTI).

Power: How To Create It, Keep It, and Use It Effectively (NTL Institute, 800-777-5227). This one-week workshop is designed to help participants understand the issues and implications of power in human relationships and how to develop greater power in their personal and professional lives.

Related Competencies:

Often working on one competency can help to develop another. Refer to *Results Orientation*, *Strategic Thinking and Impact and Influence* for additional developmental activities.

Results Orientation

Now, and in the future, predicting client needs and focusing on developing programs will be key drivers in ensuring the long-term viability of any organization. To maximize impact and achieve results, R&D organizations will need to develop and enhance research programs that will benefit both the immediate and future needs of society at large. R&D organizations will need to focus on ensuring the right mix of activities and resources to maximize impact on client satisfaction while, at the same time, maintaining the capacity to predict future science needs. Performance will be measured by how often these activities and resources are used and how effective they are.

Results Orientation is working to achieve desired outcomes that satisfy client needs. This competency is critical to enhancing programs and operations within the R&D community. Results Orientation includes setting goals and priorities that maximize the use of resources available to consistently deliver results against objectives and client expectations. It also includes a capacity to acquire resources and to attract and apply resources where deficiencies exist. At the Research Scientist and managerial levels, Results Orientation involves making explicit considerations of dynamic changes within the R&D environment. At the Senior Management level, it involves developing and implementing a clear vision of a desired program while establishing new corporate directions which will focus on enhancing research program results.

In an R&D setting, people with this competency enhance program outcomes by analyzing performance information, identifying deficiencies in capacity and knowing sources to leverage support to augment resource deficiencies. They set priorities to deliver effective program results and ensure that planning is sufficiently flexible so as not to stifle creativity. They predict and manage emerging issues, make effective risk assessments and, in so doing, ensure the long term viability of the research enterprise.

IT IS...	IT ISN'T...
⇒ finding new ways of improving performance within budgetary constraints	⇒ assuming the traditional way of doing things is the best way to proceed
⇒ making explicit consideration of dynamic changes within the R&D environment and assessing the benefits and potential risks of the decision	⇒ believing any improvements or changes will have minimal impact on program results
⇒ developing and implementing a clear vision of a desired program which will impact internal and external clients	⇒ making no attempt to predict and manage clients' emerging issues
⇒ establishing corporate directions and measures of success to enhance research program results for the long term	⇒ assuming there is no reason to focus on the long term viability of the research program

People Recognized as Leaders in Results Orientation:

Develop new measures to enhance the long term viability of the R&D community. Leaders in Results Orientation examine those aspects of the R&D community which should be improved. They consider the measures that will enhance the R&D community in the short term and long term. Leaders evaluate the pros and cons of each measure and determine which measure will add the most value. Leaders in Results Orientation take action to ensure new measures are implemented. They monitor these new measures over time and make changes where necessary.

Find out what standard practices need to be improved upon. Leaders in Results Orientation look at key performance indicators to assess whether any standard practices need to be improved upon. Questions they ask include: Is the project's timeline established? Is there a need for departmental advice? Is timely advice sacrificed for scientific publication? Leaders in Results Orientation make a list of which issues need to be addressed and develop a list of alternative courses of action to address the issues in question. They track the success of their actions on an on-going basis.

Develop a vision or research program for the Organization. Individuals strong in Results Orientation develop a vision that will improve the operations and programs of the organization. They clarify their reasoning by considering the following issues: What event or situation prompted you to try to formulate a new vision, (e.g., dissatisfaction with existing programs or results, continuous improvement motivation)? What information or resources did they consider when generating this new vision, (e.g., past experience, conference presentation, scientific publication)? What are the benefits to the organization? Leaders in Results Orientation communicate their vision and encourage feedback from colleagues to get buy-in and support.

Leverage their partnership capabilities to improve performance. Leaders in Results Orientation know the capabilities of others in their department, organization and within their network. They use others' strengths to add value and improve the delivery of programs and operations within the organization. They maintain their relationship with them so they have more than one choice when they need help. They keep a note of their most useful and productive resources. They ensure they contact these people on a regular basis, (e.g., once a month or every quarter to obtain information and build rapport). They strive to find out at least one useful fact from each contact, (e.g., what is their experience with new programs or systems, or on going problems, changes that will impact the R&D environment).

Implement untested method(s) to enhance the viability of the Organization. Leaders in Results Orientation test unconventional ideas that could benefit processes and develop alternative approaches to implementation. For example, they look at other sources, such as other research organizations, books, articles, etc., to gather ideas. They determine the likelihood of incorporating these ideas into the existing program framework and select those ideas that have the highest probability of implementation. In addition, leaders in Results Orientation solicit feedback on their ideas. They then use the feedback to modify their approach and take steps to implement the most cost-effective ideas.

Develop a clear picture of their own personal standards. Individuals strong in Results Orientation identify major areas of their job, (e.g., providing leadership, achieving business results and developing others), and regularly assess their performance strengths and development needs. They use the results of the assessment to establish personal standards of excellence. Leaders in Results Orientation ask for feedback regularly to improve their performance and set higher standards.

Identify and prioritize initiatives for the R&D community. Leaders in Results Orientation select an initiative, project or activity which they know will lead to results. They analyze the "return on investment" for the initiative by calculating the true, total costs and benefits of implementing it. Costs include direct costs, overhead costs, and benefit costs. They identify the benefits that can be gained by implementing the initiative. Wherever possible, they establish a system that tracks their progress on those initiatives and use the information to create a business case, to justify any additional resources required, or to gain support.

Improve work methods for R&D projects. Leaders in Results Orientation set goals to improve operations or enhance a program for the benefit of the R&D community. They identify whether the goal is achievable and how long it will take to improve performance. They determine the resources they need to improve the existing work methods such as purchasing a new science instrument or receiving additional support or resources on a project. They create a list of resources and sources of information they need to achieve their goal. They break down their tasks into steps and systematically review each step and revise their plan as necessary.

Suggested Resources

Reports and Initiatives, such as;

La Releve, available on Canada's Infolane (select Human Resources icon).

Environment Canada's Human Resources Management Plan, available on Canada's Infolane (select Human Resources icon).

Books, such as;

The Leadership Challenge: How to Get extraordinary Things Done in Organizations, James M. Cozies & Z. Barry. (Jossey-Bass:, 1987). This book uses case studies of 500 middle and senior managers at their personal best to demonstrate how ordinary managers can lead others to extraordinary accomplishments. The authors take the view that leadership is an observable, learnable set of practices that virtually anyone can master.

A Passion for Excellence, by Tom Peters & Nancy Austin (Random House, 1985). Also available on audiocassette. The book provides principles and ideas for achieving excellence in the organization.

Maximum Achievement, by Brian Tracy (Simon & Schuster, 1995). This book details the ideas and methods used by high-achieving people to meet challenging goals.

Seven Habits of Highly Effective People, by Steven R. Covey (Distican, 1990). This book provides thought provoking ideas on clarifying your personal values and how to translate them into your daily and weekly activities. An excellent read. This book has been made into an audio cassette.

Believe and Achieve, W. Clement Stone's 17 Principles of Success, by Samuel A. Cypert (Avon Books: 1991). This book talks about the importance of learning from defeat, how to go the extra mile and maintain a positive mental attitude.

Mastering Self-Leadership: Empowering Yourself for Personal Excellence, by Charles C. Manz (Prentice-Hall, 1991). This book reviews the theory behind Results Orientation and provides some useful tools and techniques for setting and achieving personal goals.

Courses, such as:

Achieving Breakthroughs, The Niagara Institute [1-800-661-7305]. This program builds on The Conference Board of Canada's best practices research on effective planning. The program includes identifying breakthrough objectives for their organization.

The Stephen Covey Seminar, MICA Management Resources, 1 Queen St. E., Toronto, Ont. M5C 2W5 [(416) 366-6422]. In this seminar, Dr. Covey presents his latest observations on what it takes to succeed in these turbulent times. Learnings include how to use planning to make quality decisions, how to focus on results and relations, how to take meaningful risks, how to set priorities and many other keys to success.

Roadmap to Success, MICA Management Resources, 1 Queen St. E., Toronto, Ont. M5C 2W5 [(416) 366-6422]. This seminar will help participants to define what they really want, develop steps that lead to their goals, establish the relationships they need, take effective action and overcome barriers.

Related Competencies:

Often working on one competency can help to develop another. Refer to *Self-Confidence* for additional developmental activities.

Science Knowledge

Science Knowledge is the critical factor in advancing the research mission of any research enterprise. R&D organizations need to contribute their expertise to the general advancement of science in the organization while, at the same time, partner with other disciplines in the pursuit of new knowledge. To play a vital role in the R&D community, members need to demonstrate a broad understanding of society and anticipate the future direction of science. They act as a key driver in influencing others to move the organizational mission forward.

Science Knowledge comprises the basic scientific and technical experience and skills. At the Research Scientist level, it is the ability to utilize other disciplines as needed to advance research programs. Research Scientists also integrate disciplines in pursuit of new knowledge that will advance the department's mission. At the management level, Science Knowledge involves initiating action to address and mitigate future environmental impacts on society, the economy, and government policy.

People with this competency look for opportunities to conduct research activities which impact the larger scientific community. They are recognized as leaders in the community to address future and emerging research issues. At the higher levels, people with this competency credit others with ideas to advance the research mission of the organization..

<i>IT IS...</i>	<i>IT ISN'T...</i>
⇒ moving beyond your area of specialty to develop a broader understanding of science	⇒ believing all you need to know is in your own area of expertise
⇒ involving people from other disciplines on projects to ensure all aspects of the research are covered	⇒ narrowing the scope of a project by having people in one discipline only work on a project
⇒ getting ideas from others to develop the vision of the organization and incorporating those ideas to get buy-in and support	⇒ taking an autocratic approach to developing the organization's vision and assuming the community will provide support

People Recognized as Leaders in Science Knowledge:

Build on experience. Leaders in Science Knowledge seek out opportunities to build on their experience. They demonstrate an “intellectual curiosity”. They find out about new concepts and what is going on in other disciplines. They ask what others are doing and look for activities and endeavors which expose them to new experiences. Leaders in Science Knowledge actively involve others on research projects to leverage their skills and area of knowledge.

Participate in a conference. Leaders in Science Knowledge raise their profile within the scientific community by attending conferences and speaking engagements. They are recognized as a leader or authority in an area and speak on behalf of the scientific community and the organization.

Identify critical issues and assumptions about the future. Leaders in Science Knowledge review local, national and international events and trends affecting the industry, their customers and the business in general. They consider the future direction of their clients and relevant issues within the community. They anticipate the “hot issues” and determine where the emphasis will be in the future. They present a program on what is important now and in the future. They determine and decide which issues will provide long-term benefit to the science community.

Know when to make a commitment to a research project. In making decisions, leaders in Science Knowledge recognize when an idea leads them down a “blind alley” and are able to walk away from it. They know that for every hundred ideas there are ten good ideas and one important idea. When others disagree with their decision, they are able to manage this tension. They ensure they have the resources necessary to address current issues while investing time in exploring the “important idea”. They can distinguish between ideas that are “disciplinary perspective” but not an “issue management perspective”. They make sure they have good science and issue knowledge to defend their position.

Manage a person to broaden their career. Leaders in Science Knowledge are able to identify people

and manage their development. They guide people in new directions or put them in situations that will challenge them. They send potential leaders to a national or international conference so they could find out more about the scientific community and speak with people in other disciplines. They may also involve someone on a project to write the overview of a research paper or communicate information to a wider audience.

Integrate expertise from other disciplines on projects. Leaders in Science Knowledge involve others from other disciplines on research projects. They manage a group of scientists from diverse backgrounds on projects which are “issue-based” vs. “disciplinary”. They make a conscious effort to use people from other disciplines to advance the research program. They meet with colleagues to discuss those activities that will contribute to the project and get their support to move the project forward.

Involve others in the scientific vision. Leaders in Science Knowledge provide a structure in which others can contribute their ideas to the strategic direction of the organization. They ask others for their input and solicit ideas to advance the organization-wide goals. They realize that any success is not their own success, and credit others in the decision making process.

Act as the “sparkplug” to the organization. Leaders in Science Knowledge have normally moved up through the organization and developed their expertise over the years. They know the organization and the R&D community. They think about the future of the organization and the future of science. Where is it headed? What will the organization need to do to be seen as the leader locally, nationally, and internationally? Leaders in Science Knowledge are the stewards of the organization. They are accountable for the climate of the organization and make decisions to promote a constructive work environment.

Suggested Resources

Books, such as;

The Dragons of Eden, by Carl Sagan (Random, 1977).

Discovering the Double Helix, by James Watson and Francis Crick.

Science & Government: Godkin Lectures, by C P. Snow (Amereon Ltd.).

The Prince: Machiavelli by James Atkinson (Barron, 1985).

Memo to the Boss from Mack: A Contemporary Rendering of the Prince by Niccolo Machiavelli, by W.T. Brahmstedt (Pubns, 1986).

Attend labs, conferences to learn new concepts and develop your Science Knowledge.

Related Competencies:

Often working on one competency can help to develop another. Refer to *Conceptual Thinking, Strategic Thinking and Impact and Influence* for additional developmental activities.

Self Confidence

The R&D environment is faced with increasing demands related to client expectations and enhanced competition. To meet these challenges, individuals must demonstrate a willingness to take calculated risks or be exposed to uncertain challenges. In essence, self-confidence will continue to be an important competency for those involved in research. The ability to defend positions, manage realistic expectations and command the respect of others are characteristics of individuals with strong self confidence (reference Developmental Recommendations and Resources cited below).

Self Confidence is the ability to state and defend ideas and convictions, to assess and accept risks, both in science content and the management of science, and to recognize options. It includes having the self-assurance required to use one's capabilities to the fullest and the strength to stand alone when this is the best course. At the Research Scientist level, self confidence involves standing up to one's own convictions, and explicitly stating confidence in personal judgment where appropriate; at the managerial level, individuals look for challenging assignments and actively seek new responsibilities and accountabilities. They state their own view clearly and confidently, even in conflict.

People demonstrating this competency stand by their own convictions, and explicitly state confidence even in a conflict. This trait is generally characteristic of researchers. Those considered successful are aware of the impact this confidence has on others and are able to adjust their approach so as not to intimidate others. They like challenging assignments and actively seek out new responsibilities and accountabilities.

IT IS...	IT ISN'T...
⇒ speaking in a confident and assured manner even when others disagree with you	⇒ sounding unsure and uncertain to others
⇒ accepting new challenges and responsibilities	⇒ playing it safe by confining one's tasks to a specific well-known area
⇒ standing up and defending your ideas if challenged, regardless of the source of opposition	⇒ backing down or remaining silent, when someone criticizes your position
⇒ continuing with an appropriate action plan, even when there are political pressures to stop	⇒ deciding you are always right and never taking others' interests and wishes into consideration

People Recognized as Leaders in Self Confidence:

Identify their strengths at work and challenge themselves to improve their skills. Leaders in Self Confidence identify several activities, (e.g., scientific, managerial, etc.), in their job which they tend to perform very well and which they enjoy. They also identify those activities which are not closely matched to their strengths, then choose a project which is challenging yet attainable and which will allow them to test their limits. In addition to identifying their strengths at work, leaders in Self Confidence outline a set of realistic goals and expectations for a project. They monitor their progress and their ability to reach those self-imposed goals and expectations. When they encounter difficulties and roadblocks, they think about how they have overcome similar obstacles in the past. As they accomplish new tasks, they continue to challenge themselves by expanding the scope or number of tasks on which they are working.

Build their experience. Leaders build their Self Confidence from experience. They acquire information and knowledge within science management as well as outside the R&D community. They believe to present themselves well they need to have a broad understanding of the R&D community as well as the social, political and economic forces affecting the environment. They speak with people internal and external to the organization and develop their techniques and approaches from project work.

Develop a mastery. Leaders in Self Confidence are experts in their field. They are invited to attend conferences and speaking engagements on behalf of the organization. They share their successes and challenges in their work, and how they handled situations. They defend their thesis, hold their own in a debate, and give presentations of their work. As leaders, they recognize that over-confidence in their field can lead to arrogance. They recognize and acknowledge that others have helped them along the way to develop their expertise, mentor them, and provide them with the resources needed to get ahead.

Look for challenges. Leaders in Self Confidence look for a new venture, project, or go outside their usual area of research to try something new and different. They look for work outside their immediate specialty and expand to another field to enhance their competency base. They deal with conflicts, problems, and barriers as they arise. They base their achievements on what they accomplish. They set realistic targets and objectives, (e.g., there is a 50/50 chance of actually achieving the goal).

Overprepare and overpractice. Leaders in Self Confidence do so much background work and checking that they are able to respond with authority to any question when asked. They practice giving arguments to support their position. They get others to play “devil’s advocate” and practice responding to them. When they are pushed towards a decision against their better judgment they ask for time to think about it before committing. When thinking about the issue they overprepare and overpractice before moving forward.

Express their opinion even when others disagree. Leaders in Self Confidence are not afraid to voice their opinion or concerns even when others disagree with their perspective. They respect other’s self-esteem. They do not tell others they are wrong. They just state their point of view is different and express it. They seek feedback from others to ensure their opinion is expressed clearly.

Build new partnerships to improve the quality of research in the R&D community. Leaders in Self Confidence set up a network of associates to gain support on research projects. They use their expertise and confidence to approach others and help them deliver research work, (e.g., picking a university that has the capabilities to collect information or conduct a feasibility study). They take their time in selecting a new partnership. They are not just interested in the short term, but how the relationship will work for the long-term; therefore, they will continue the relationship even when the project or research is over. They choose partners that have an interest in the R&D community, have funding, and conduct their share of the work. They depart from the relationship when there is no win-win and take a stand when the partnership is not in their best interest.

Suggested Resources

Reports, such as;

Developmental Recommendations and Resources, Public Service Commission of Canada.

Books, such as;

Awaken The Giant Within, by Anthony Robbins (Distican, 1992). This is a popular book which helps you feel better about yourself and confident that you can achieve more.

Feeling Good, by David Burns (Signet Books, 1990). This book, written by a renowned psychologist, outlines simple step by step techniques to control the negative thought patterns that lead to lack of self-confidence and low self-esteem. Highly recommended.

Seven Habits Of Highly Effective People, by Stephen R. Covey (Distican, 1990). This popular book provides advice on living effectively and wisely. The ideas in the book can lead to improved effectiveness and self-confidence.

The Psychology of Achievement, by Brian Tracy (Nightengale Conant Corporation, 1984) (video).

Courses, such as;

Positive Thinking, Sylvia Kestengerg/Job Design Concepts, 46 Misty Crescent, Don Mills, Ont., M3B 1T3 [(416) 447-8832]. This workshop will teach participants to develop a winning approach, build their self-esteem and confidence and be positive in their thinking.

Toastmasters International , No Charge-Dial 1-800-993-7732

Related Competencies:

Often working on one competency can help to develop another. Refer to *Results Orientation* and *Partnering* for additional developmental activities.

Strategic Thinking

Increased pressure in competition and changes in the industry will play significant roles in determining the strategic direction of science over the next years. To play a vital and personal role in setting strategic direction, members of the R&D community will need to understand and address political issues, trends, and processes which are linked to the organization and which impact the community at large. The ability to make this link and to understand processes and trends will be essential for leaders to formulate strategies, address problems, and use opportunities that extend the boundaries, influence and impact of science.

Strategic Thinking involves demonstrating an intimate understanding of the limits, nature and potential of the organization. It encompasses an understanding of how the organization interacts with the external world and the ability to develop strategies and alliances to achieve organizational success. At the Research Scientist level, Strategic Thinking involves analyzing how these changes impact clients and the department and recommending actions to achieve desirable outcomes. At the managerial level, Strategic Thinking involves understanding Environment Canada's long term strategy and developing and recommending long-term alternative courses of action to achieve success at the departmental levels in one's own area of responsibility.

People demonstrating this competency develop and recommend long-term alternative strategies for achieving success at the departmental level in their own area of responsibility. They think about the external environment and develop alliances to achieve long-term strategies.

<i>IT IS...</i>	<i>IT ISN'T...</i>
⇒ analyzing changes which impact client needs, stakeholders, or relations within the community	⇒ setting goals that are independent of other functions
⇒ developing and recommending alternative strategies for achieving long term success	⇒ assuming there is only a need to develop courses of action for the short-term
⇒ actively addressing long-term problems, opportunities, and external forces affecting the organization	⇒ failing to look at solutions which go beyond the internal environment
⇒ taking the time to understand the pertinent research issues and then creating the strategies for success	⇒ finding alternative research strategies only to have short term results

People Recognized as Leaders in Strategic Thinking:

Determine the activities needed to deliver science to the R&D community. Strategic Thinkers focus on a strategy to deliver science to the R&D community. Leaders in Strategic Thinking determine what they are going to deliver to the community, how they are going to get people involved in the work, and where they are going to get the funding to pay for it. They determine the resources they need to deliver science and develop an action plan to get there.

Identify the R&D community's concerns and assumptions about the future. Strategic Thinkers talk to colleagues in the R&D community on a regular basis about relevant issues, trends and concerns they have about the future. They ask community members to share the ideas and plans they would like to see implemented. They have a capacity to synthesize information, summarize common themes and communicate their findings to others. They incorporate their impressions into the critical issues facing the community and their research area.

Summarize trends, processes and outcomes as they impact the R&D environment. Where precedents are absent, Strategic Thinkers use various sources, (e.g., scholarly reports, journals, conferences, etc.), and tools to gather information on trends in the R&D environment. For example, they may develop a process for tracking their external clients/partners, (i.e., community groups, other agencies), and the services they provide to customers. To summarize trends and outcomes, leaders ask: What will be the research area's future requirements? What priorities should be focused on? What will be needed to develop new research ideas and services? How should the strategy be communicated (internally and externally)? How can the strategy or policy be tested with the community and the organization prior to implementation? Based on an analysis of this information, Strategic Thinkers

summarize their conclusions then plan a course of action to effectively address internal and external needs.

Conduct a strategic analysis. Strategic Thinkers look at a variety of areas to develop a strategic analysis. They will take a concept and develop a plan to implement and educate others. They are receptive to a variety of avenues to achieve their objectives and develop a range of contingency and back-up plans. For example, they identify leaders in action and decision-making within the community, assess community expectations, identify barriers to effectively meet expectations and, through this analysis, are able to develop actions that will lead to improvement and achievement of their long-term goal. They get buy-in and support to the action plans from the leaders and decision makers. (This activity can also be found in Impact and Influence).

Practice developing their strategic thinking. Strategic Thinkers practice how to improve and develop their Strategic Thinking skills. They participate in activities and games that lead them to the edge of their competency. They work to further develop the competency and push themselves to their limits. Examples of games to play include, "GO", "Mindmaster", and "Chess".

Develop long-term alternative strategies for achieving success. Strategic Thinkers think about non-financial resources and support that will assist the organization in its research pursuits. For example, one of the initiatives they may pursue involves identifying leading researchers from related fields who could add value to the organization through mutual partnership. They may organize a forum that brings together these leading edge researchers. Based on this forum, Strategic Thinkers assess whether the organization is working at a highly effective level and may ask such questions as: Do they have an adequate level of technology in order to support the research goals? Are they generating novel ideas regularly? Are they following up on newly implemented research programs to ensure their effectiveness? Are they paying attention to the communities' concerns? Strategic Thinkers document any concerns they might have and then meet with their colleagues to discuss these concerns and suggestions for improvement.

Look for roadblocks in existing processes and procedures. Removing roadblocks sometimes creates a far more efficient process. Strategic Thinkers anticipate the requirements and constraints inherent in processes and procedures then identify potential roadblocks and sandbags. They devise ways of circumventing or eliminating those roadblocks and implement the changes. They look for opportunities where similar processes and procedures have been implemented and find out what roadblocks were encountered. (This activity can also be found in Conceptual Thinking).

Review the priorities and current activities of their research area. Strategic Thinkers identify those priorities that will deliver expected short term results and those that will deliver medium term results. They assess whether or not they have the right balance between the short term and medium term results. They make decisions to forgo any activity that is not aligned to deliver results. They are prepared to walk away from any activities or issues that do not align with the strategy or fail to contribute to results. They redeploy resources to the medium and short-term priorities that require the most support.

Develop and test research assumptions. Strategic Thinkers develop and test assumptions about new ideas and directions. They review information and identify the major research themes. Based on these themes, they formulate new and improved directions for future work. As a way of gathering information, they facilitate a meeting with colleagues to help quantify their assumptions and financial feasibility. They test their assumptions by participating in internal and external forum on research issues and future trends.

Suggested Resources

Books, such as;

The Mind Of The Strategist, by Kenichi Ohmae (McGraw-Hill, 1982). Master strategists exploit every opportunity and advantage, and they continually provide customers with valuable products and services. The legendary Ohmae, head of McKinsey's Tokyo office, teaches the basic elements of business strength.

Strategic Alliances, by Michael Yoshino & U. Srinivasa Rangan (Harvard Business School Press, 1995). This book talks about new alliances (cross border relationships) that have become an integral component of competitive strategies. These new alliances are envisioned as instruments of long-term competitive advantage, and the book reveals possible risks and rewards of choosing alliance strategies.

Thriving On Chaos, by Tom Peters (Harper-Collins, 1989). A popular management book showing how we can (and must) respond flexibly to an ever-changing world.

Competing For The Future, by G. Hamel & C.K. Prahalal (Harvard Business School Press, 1994). This book advises companies to be constantly thinking ahead to the future, and sets out a plan on how to accomplish this.

The Digital Economy, by Don Tapscott (McGraw-Hill, 1996). Tapscott introduces the notion of a new digital economy where three converging technologies transform business. Success, he says, belongs to those who can compete through the networking of human intelligence.

The Art of War, by Sun Tzu (Shambhala, 1998).

Courses, such as;

Competitive Marketing Strategies, Canadian Management Centre, 150 York Street, 5th Fl., Toronto, Ontario, M5H 3S5 [(416) 214-5678]. This course will teach participants how to use target marketing positioning and marketing intelligence to develop a competitive strategic marketing plan.

Related Competencies:

Often working on one competency can help to develop another. Refer to *Conceptual Thinking* and *Impact and Influence* for additional developmental activities.

Team Leadership

Public Service leaders of the future must be willing to share information and expertise to work toward the solutions that will ultimately result in the government's desire to achieve seamless and efficient delivery of services to the Canadian Public (reference La Releve website). Leadership involves attracting, mobilizing, and developing talent to drive organizational objectives and achieve results.

Team Leadership involves taking on a leadership role, formally and/or informally within a group. At the Research Scientist level, it involves creating opportunities for other team members to attain success. Team Leaders ensure that the work environment is conducive to learning and responsive to individual team members' needs for personal development and the achievement of results. At the managerial level, the Team Leader leads and communicates a compelling vision and works to resolve conflicts between groups.

People demonstrating this competency take care of the group and use resources, tools and information to achieve results. At higher levels, they use complex strategies to promote organizational effectiveness, consensus building, and the dissemination of information to other areas to aid in collaborative decision making.

<i>IT IS...</i>	<i>IT ISN'T...</i>
⇒ managing team procedures and meetings through the efforts of team members	⇒ believing that if you want it done right, you need to do it yourself
⇒ “walking the talk” by demonstrating the actions you expect from other team members	⇒ creating rules or policies for the team that you do not follow, (i.e., “do what I say, not what I do”)
⇒ making ongoing efforts to enhance team and individual morale	⇒ leaving it up to their staff to let you know what they need to get the job done
⇒ making sure your team has appropriate training and other resources to do their work effectively	⇒ acting as an administrator passing along information on policies
⇒ leading and communicating a compelling vision to the team	⇒ assigning tasks to team members without providing them with an understanding of the ultimate goal

People Recognized as Team Leaders:

Set objectives to achieve results. Team Leaders set objectives that are specific, measurable, attainable, relevant, and time-based. They discuss what the end result should look like. They look for ways to measure results, quantify resources and set attainable goals. They link objectives to the organization’s goal and monitor the time and completion of a project. Leaders communicate their standards to those involved. They compare results to the standards they have set for each project on a regular basis, (e.g., quarterly, annually), and reassess whether the objectives were realistic (attainable) and relevant to the project.

Measure group effectiveness. Team Leaders measure the effectiveness of a goal or objective. They keep track and get the group to buy-into the group process. They solicit their involvement and take direction when necessary. They seek feedback to measure individual and group performance and communicate the results to those involved. Team Leaders discuss their plan of action with others and communicate the steps of the plan. They address development opportunities and capitalize on strengths. They put their plan into action and then monitor the action steps.

Mobilize the talents of the team. Strong Team Leaders are cognizant of and value diversity. They recognize the strengths and weaknesses of those on the team and value the input of team members. They seek to establish a working environment conducive to individual and organizational learning. Their self confidence does not interfere with their ability to admit their own weaknesses and to solicit the support of the team. They offer compromise where it does not affect the integrity of the work and draw the line where and when necessary, explaining reasons and rationale for their decisions and actions.

Provide honest and constructive feedback sensitive to the needs of others. Effective Team Leaders understand the importance of providing timely feedback to others. They recognize the needs of each individual and adjust their approach accordingly. They are effectively able to deliver criticism in a constructive and positive way that supports learning and which respects the feelings and needs of others.

Use their credibility and expertise to leverage their position within the R&D community. Strong Team Leaders display loyalty to the department and to the organization. They build rapport with their team members and people in other parts of the organization. They use their expertise and proven track record to take the position as 'leader' and communicate the vision of the group. They are willing to partner on organization responsibilities and research projects to advance science in the R&D community.

Ensures the group has the appropriate resources for research. Strong Team Leaders review proposals, follow-up on projects, and encourage work across specialized areas. Team Leaders provide financial control of research projects. They develop contracts, delegate responsibilities, and negotiate and resolve financial obligations. They inform senior management of developments within projects and provide them with status reports.

Look to the future. Team Leaders plan for what needs to happen next in science. They think about the research their group is currently doing, and what needs to be done to keep science at the forefront of other disciplines, (e.g., medicine, law, etc.). They determine the kinds of people they need in their group, the expertise they are missing, and how they can fill the gap. They look for ways to address how to attract and retain the top talent and how to develop their team members. They discuss with team members what they want and how they can help them address their career aspirations.

Suggested Resources

Books, such as;

Creating the High-Performance Team, by Steve Buchholz and Thomas Roth (John Wiley & Sons, 1987). This book provides a step-by-step guide to leadership and communication techniques for creating more effective teams. It addresses how to provide strong leadership, creating and reinforcing a positive work culture, generating interdependence and group synergy, setting goals, anticipating problems and tapping the creativity of the team.

Management of Organizational Behaviour, by Paul Hersey and Ken Blanchard (Prentice-Hall, 1988). This book describes a technique and model to appraise individuals and their work situations in order to provide the most effective coaching style to encourage or sustain performance. Recommended for all levels.

The Team Building Tool Kit, by Deborah Harrington-Mackin (Amacon, 1993). This book provides rules, tips and techniques for teams. It's particularly valuable for team leaders. Information offered in a question and answer style.

A Force for Change: How Leadership Differs from Management, by John Kotter (Free Press, 1990). This book describes the nature of leadership within cogent case studies of effective application (see especially Chapter 2)

Courses, such as;

Leadership for New Challenges (LNC) and Learning for Tomorrow (LFT), Environment Canada. The LNC and LFT workshops offer tools to enhance leadership, team and partnering skills. They foster the learning organization concepts and promotes a change of culture within the Department.

Leadership Through Team Building, York University Executive Development, [(416) 360-8500]. In this one-day course, participants learn the behavioural practices necessary to succeed as managers of other people. Case histories, problem simulations, and leadership analysis will be applied.

Developing High Performance Teams, Canadian Management Centre, [(416) 214-5678]. Learning points in this three-day program include understanding the concepts, theories, and practical skills needed to convert a work group into a high performance team. Topics include resolving rivalries and conflicts among teams.

Leadership Effectiveness Training, Eileen Howell & Associates Inc. [1-800-750-7954]. This workshop helps future leaders realize their potential, by looking at their own and others' behaviour in a whole new way. This knowledge is then applied to situations which commonly confront leaders (and everyone else!) such as negotiations, conflict within a team, a goal of increased productivity, etc. The emphasis is on learning by doing with personal coaching to reinforce the lessons.

Related Competencies:

Often working on one competency can help to develop another. Refer to *Ethics and Values, Results Orientation, and Self Confidence* for additional developmental activities.

Other Resources:

Departmental Learning Resource Centres, a variety of books and videos are available at these centres located in the Burlington and Downsview libraries

Environment Canada Virtual Learning Centre, http://www.wib.tor.ec.gc.ca/vlc_cav/

Training and Development Canada, <http://www.edu.psc-cfp.gc.ca/tdc/index.html>

Canadian Centre for Management Development, <http://www.ccmd-ccg.gc.ca/>

Developing a Plan

The first step in developing an action plan for learning is to establish specific learning objectives that are concrete and measurable. In doing so, one is well advised to consider as many sources as possible: colleagues, peers, supervisors, those reporting to you; anyone who is in a position to observe your work habits with sufficient frequency and scope of contact to be able to offer valid comment and who's opinion you value and trust.

The broader your base of feedback, the more valid and objective will be your starting point for planning. Ensure to factor in your own perspective, because your own personal reflection will be the most valuable source of information that you have. The Hay/McBer Competency Portfolio (available at the CCIW Resource Centre or from Human Resources) is a standardized method for gathering feedback. The feedback questionnaire has been modified to solicit information specific to the Core Competencies that have been developed for successful R&D Management at NWRI and will assist you in targeting the competencies that you may want to further develop and refine. You may want to consult with your Human Resources Advisor who can provide you with information and advice on a suitable process that will meet your needs.

Once you have assembled your feedback information, you will be ready to begin developing your plan. The Personal Development Planner found on the following pages has been designed to provide a framework to assist you in targeting specific learning needs and in establishing a concrete plan of action that you can use to review and monitor your progress. It is available electronically at <http://loki.cciw.ca>.

Be patient and realistic in your planning. Use all resources available to you. You will find some valuable suggestions in the Development Resource Guide. Human Resources staff are available to assist you. Be positive, and enjoy the journey.

EMPLOYEE IDENTIFICATION

Name:

Date:

Planning Period Covered:

1. SET OBJECTIVES

- ☐ The goal of the personal development planner is to:
- provide a framework to assist you in the targeting of specific learning needs
 - assist in the focusing of development activities
 - record action plans to strengthen competencies and achieve new skills
 - maintain a record of progress in achieving learning objectives

Identify one or two competencies you will be targeting for development over the next planning period.

Competencies:

1. _____
2. _____

What are your learning objectives? (Reference behavioural statements from R&D Management Competency Dictionary. Select the behaviour groupings from the targeted competency level you want to achieve) i.e., *At the end of this planning period I will be able to...*

What is your target completion date (when do you plan to have achieved your learning objectives)

1. _____
2. _____

2. IDENTIFY CHALLENGES/BARRIERS

Identify challenges or barriers, as you see them, as well as potential actions that can be taken to overcome them.

3. DEVELOP AN ACTION PLAN

- ☐ What activities will you undertake to develop in the competencies you have identified. (Refer to the Development Resource Guide (DRG) for suggested activities, books and courses, etc.). Include in your plan completion dates.
- ☐ What support do you need from others (SMT, project chiefs, study leaders, colleagues, human resources, etc.)

Notes, Progress and Achievements

WHY ASPIRE TO BE A RESEARCH MANAGER IN A FEDERAL SCIENCE DEPARTMENT?

The National Water Research Institute (NWRI), recently completed a series of Core Competencies for the three levels of institute science management positions. These include descriptions of the knowledge, skills and abilities as well as a series of behaviours that the organization expects in successful research managers. These competency documents allow research managers and those aspiring to rise through the research management stream to assess their abilities and develop competencies they will require to be successful in future positions.

Prior to reading the core competencies for research managers there is a need to describe the advantages of entering research management. It is fundamentally important to realize that entering research management is not an option for every scientist, nor should it be, but it is a career choice that can mean a highly rewarding challenge for a few individuals.

Research scientists are largely trained to the Ph.D. level and then work alone or in small teams to be promoted on the basis of personal scientific accomplishments such as productivity, creativity, recognition and influence. Many researchers, especially those at universities, never leave this mode and retire as full professors. In the federal public service most retire as intermediate or senior research scientists (RES) with little or no research management experience, other than with small teams or gained through supervision of students. The question that many of these individuals ask is not "How do I obtain the competencies to be a research manager?" but rather "Why would I want to?"

There are many perfectly valid answers to the latter question based on personal aspirations and choices, and other explanations. Many answers can be found in the descriptions of the core competencies for research managers and would be immediately recognized by those who already know the value of becoming a research manager in the federal public service.

For example, these competencies include the willingness to change area of research, to expand into new scientific fields, to being willing to contribute to a team approach, and provide advice on research direction to other scientists within the group. Ultimately, this often means accepting that the directed researcher is the one to reap scientific rewards.

The fact that as each higher level is reached, a greater proportion of a research manager's time is spent on administration, bureaucratic activities, personnel issues, etc., rather than on research cannot be discounted. The question is whether this can be viewed positively, e.g., for personal scientific development, to assist others to advance their careers, discovering new research directions, acquisition of broader knowledge, etc., that eventually enhance the scientific accomplishments, recognition and credibility of the research manager.

The main personal benefits and career enhancing reasons for entering research management include the following:

1. Broadening ones' knowledge of various scientific fields through continuous learning. The flexibility to address new areas of research can be, for some, a more attractive proposition than staying within the limits of a chosen field.

2. The opportunity to teach and influence other scientists, or direct other scientists to research critical priority areas and issues. These opportunities and their results bring great satisfaction, and in the case of environmental research, benefit the "public good".
3. The ability to establish research teams whose synergy benefits and enhances the skills of the individuals, and leads to the resolution of complex research questions that could never be answered by any one individual alone.
4. The opportunity to be a more important component of the decision-making process, for example, through the control of a budget.
5. Scientists who remain in their original chosen field may risk disappointment should their research become less relevant to new and evolving priorities. This situation is less likely for a research manager.
6. Research management allows one greater access to and thus influence on research directions at higher levels in the organisation and thus the ability to feel more in control of one's research direction and career.
7. Research management allows one to play a greater role in the formation of the research team through the choice of research disciplines in the specific group being managed.
8. Research managers with broad connections within the government are likely to be known at senior levels and more likely to be asked to undertake international duties and attend international meetings. Research managers also assist in determining the conferences and other travel which scientists participate in, thereby contributing to the recognition of scientists and their work.
9. In some cases, managing a group which delivers research results in the form of a packaged product may bring international recognition to the research manager, as well as to the contributing individuals. The latter may be better known in their individual discipline, the former for their broader perspective on an issue.
10. In the federal government, competent research managers are often given the opportunity to brief senior officials on research and policy issues, thereby forging the science-policy link. This opportunity, often missing at the research scientist level, gives the manager a tremendous sense of the value of the research to the organization.
11. Research managers commonly have to deal with several major policy issues at the same time and anticipate new ones on the horizon. At the end of their long careers, managers can look back on their involvement in and success with many multi-disciplinary research teams. For example, a research manager at NWRI can see the results of major research efforts in remediation of geographic locations, such as the Great Lakes or in the Arctic, or in the area of regulation of different industries.
12. Research managers can derive fulfillment in looking back at their careers, to both their individual accomplishments, and those of the teams they managed.

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