From a researcher to a manager:
Transition and learning strategies
(Or, Is it worth it and how to do it well?)

Kari Pulli
Nokia Mobile Phones
kari.pulli@nokia.com

ABSTRACT

Researchers and managers have, on the average, quite differing mindsets. However, many researchers, in the course of their professional career, become managers. It is also true that researchers need managers, but the best manager for a researcher is many cases another, perhaps ex researcher. This study presents concepts of management and leadership, especially in research and advanced development organizations. Various motivations for doing the transition from a researcher to a manager are presented and analyzed. A transition means giving up at least parts of old, and in this case one may be required to give up your self-image in exchange for a new one. Hence, the question whether or not to perform the transition is a serious one.

A successful manager needs a skill set that differs in many ways from that of a successful researcher. We cover both what those new skills are, and various approaches how to acquire them.

Keywords: Management learning, Researcher self-image, Organizational socialization

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PREFACE

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This study has given me an opportunity to reflect on what I have learned during the last two years, both in the Executive MBA course and especially at practical work as I have partially moved away from doing hands-on research on my own to lead a group of researchers. Doing this study made possible (and forced me to) find time to learn more about the human side of management in general and research management in particular. It has also given me an opportunity and tools for further learning.

I would like to thank several people who have made this possible. Pekka Isomursu encouraged and supported the idea of me taking up the eMBA course. Heikki Huomo approved it on Pekka's recommendation, and gave me the general topic for this study. The topic proved an interesting one. Miia Martinsuo gave me a lot of enthusiasm, ideas, and good pointers into relevant literature both about research management and about the socialization process into management. I had several rewarding discussions with Tuomo Peltonen, a professor from the University of Oulu nominated my advisor for this thesis. He gave me new points of view that I didn't get from other, more engineering oriented contacts. Also my colleagues and team at Nokia Mobile Phones research department deserve thanks for a rewarding, at times even pleasurable learning experience.

Finally, I want to thank my family for their support and putting up with daddy who is spending way too much time reading about management and typing a thesis, instead of doing his really important job: playing more with his daughters.

In Oulu June 12, 2001,

Kari Pulli

1. Introduction

This report is aimed mostly at a researcher or an engineering specialist about to become, or has recently become, a manager. Being aware of the typical motivations for moving into management, as well as what is involved in such a move, may aid in the decision on whether or not to move into management. Once the decision has been made, having an idea of the new attitudes and skills, and how they are typically obtained, can make the transition easier. The same awareness can also help managers to better understand the personal motives of their subordinates and the impact those motives might have on future job performance. This study may also be useful to those in HR who influence the career stream development policies and practices and help individual researchers in planning and advancing their careers, whether they move into management or not.

1.1. Management and leadership

Management is an abstract concept that involves coordination of people, resources, and activities. It is a functional requirement of a work organization [47]. Managers are the people doing the management, and they do it by managing. Managing is the set of activities that concretely brings about management. It involves proactively influencing the thinking and behavior of people, by means of persuasion, bargaining, compromising, etc.

Though the terms management and leadership are sometimes used interchangeably, there is a difference between the two terms. While both terms relate to organizing the activities of an organization, management concentrates in minimizing the likelihood and severity of problems and increasing the efficiency of the organization. That is, those things that you decide to do, do them well. It deals with things such as planning and budgeting, organizing and staffing, controlling and problem solving. Leadership, on the other hand, aims to maximize the opportunities and stresses the effectiveness of the activities. In other words choose the right things to do. It deals with things such as establishing a direction and aligning, motivating, and inspiring people. You can do management just by virtue of being appointed as a manager, but you can only be a leader after the leadership is ratified in the minds and hearts of the people you lead.

Farthing [14] gives a brief history of management theories in the 20th century. The earliest one was the *scientific management theory*, introduced by Frederick Taylor [44]. The most notable organizations were large and industrialized and concentrated in manufacturing. Scientific and technical matters were valued, and management was thought as something that could be carefully specified and measured. The scientific theory was embellished in the 20's by the *bureaucratic management theory*, which originated from Max Weber's writings. The theory focused on dividing organizations into hierarchies, establishing strong lines of authority and control, and developing comprehensive and detailed standard operating procedures for all routinized tasks. The *human relations movement* that began in the 30's and still continues began as a reaction to the rather dehumanizing effects of these theories. More attention was given to individuals and their unique capabilities, and it was understood that the organization would prosper if its workers prospered as well. The *motivational management* model based on the Maslow's hierarchical need-satisfaction model (see Fig. 1.1) [31] was influential in the 50's and 60's. It attempted to allow employers understand how to get employees to

Figure 1.1. Maslow's hierarchy of human needs.

perform better, but it turned out to give a too simplistic view of people and their motivations. Drucker's *management by objectives* [12] was the main management theory of 60's and 70's, and it aims to increase organizational performance by aligning goals and subordinate objectives throughout the organization. Ideally, employees get strong input to identify their objectives, time lines for completion, etc., and there is ongoing tracking and feedback in the process to reach objectives. The critics of the theory might say that "it works when you know the objectives, ninety percent of the time, you don't". 80's saw several populist approaches, such as the one minute management (one minute objective setting, praising, reprimand, etc.) or the ABC's (Activators — actions taken by manager before somebody can accomplish a goal, Behavior — what the person says or does, and Consequences — actions by manager such as praising, reprimand, or giving a new objective). One of the more current theories is *empowerment*, which authorizes employees to do their work without the need to seek approval from supervisors. Empowerment gives a sense of responsibility and achievement to employee, reduces delays in flow of work, and reduces workload on manager as it works mainly on the basis of exception reporting.

Lundy and Cowling presented a concise survey of leadership theories [27]. The *trait theory* of leadership is characterized by the phrase "leaders are born, not made", and it sought to find universal personality traits that good leaders have and that separate them from less effective leaders. The *behavioral theory* of leadership concentrates on styles of leadership and search for an ideal leadership style. As it became clear that no single style fits every person and situation, the *contingency or situational theory* declared that the correct leadership style is contingent on such factors as the leader-subordinate leadership, both the leader's and the followers' characteristics, and the culture and the environment of the organization. The *attribution theory* brought into the picture the dynamics of the interaction between the leader and the follower. It also claims that leadership only exists as a perception: individuals develop their own implicit cause-effect theories that help them make sense of the events in their lives. Leadership would then depend on how the subordinates view a leader's performance and its effects given their leadership expectations and preferences.

The latest of such theories is called the *transformational theory* of leadership which appears to synthesize aspects of the previous theories. Some of the new qualities that an effective leader must have include being a visionary, risk-taker, adaptable to change, able to delegate, and willing to empower others. The new leader must exemplify the values, goals, and culture of the organization and place emphasis on innovation. In short, they will be effective primarily in their ability to comprehend, visualize, conceptualize, and articulate to others the opportunities and threats facing the organization.

1.2. Research and development organizations

R&D efforts are often classified as belonging to one of three categories: basic research, applied research, and development. Within US industry in the mid 90's over 70% of the research expenditure was spent on development and only about 6% on basic research [20]. Within universities the relative weights went exactly the other way, basic research taking the bulk of spending, followed by applied research and leaving only 8% for development. The National Science Foundation (NSF) defines the categories as follows:

Basic Research The objective is a more complete knowledge or understanding of the subject under study, without specific application in mind, although it may be in fields of present or potential commercial interest.

Applied Research The target is to gain knowledge or understanding to determine the means by which a specific, recognized need may be met.

Development is the systematic use of the knowledge or understanding gained from research, directed toward the production of useful materials, devices, systems, or methods, including design and development of prototypes and processes.

Research, whether industrial or within universities, is always sponsored by somebody. Even when the sponsors are generally satisfied with the output of a research organization, they still often have comments such as "Research takes too long; we need answers quicker than researchers provide them.", "The research program is too esoteric, we need solutions that are practical.", or "We always hear about your previous accomplishments, how about the future?". While the researchers should be responsive to the sponsor's needs, one can also try educating the sponsors why it is in their best interest to make sure that the solutions are scientifically valid, are appropriate to the problem at hand, and truly provide an improved solution compared to the existing technology. One may also undertake a mix of research activities ranging from basic research that might take from three to five year to applied research that might provide solutions already within one or two years. Researchers should also be wary on working only on the research needs identified by the customer, lest they work only on yesterday's problems, or today's problems in a very narrow framework. For example, during World War II, some customers would have probably identified as their main need bigger and better binoculars, while researchers gave them the radar.

Jain and Triandis [20] give a few reasons for the unique problems of managing R&D organizations: the character of the enterprise and the type of people involved in R&D. First, the output of a research organization is something very intangible, namely information. Second, creating and gathering information involves considerable uncertainty since the output can never be predicted perfectly from the various inputs used. How can you plan or anticipate a scientific breakthrough? Third, though managing people is always challenging, Jain and Triandis claim that people in research, often highly trained and with high aptitude, are more independent and articulate. Some of the very smart people don't necessarily have matching social skills, and an R&D manager needs to learn to tolerate a broad range of behaviors from subordinates and colleagues. Finally, the manager also has to understand the ethos of a scientific community with its focus on universalism and sharing of scientific knowledge.

1.3. Leadership in a research organizations

We claim that managers in R&D organizations should have strong technical background. Studies have shown that where the supervisors were rated highest in technical skills the research groups were most innovative, and, conversely, where supervisors had high-level administrative skills but did not possess excellent technical skills, the research groups were least innovative [13]. The technical background is required for the credibility of the leader from the viewpoint of the researchers he or she is leading. Finally, many decisions require understanding of the technological issues, for which non-technical people are ill equipped.

On the other hand, there are clear costs involved when highly skilled engineers move into management, especially since it is usually the best ones who gain such promotions. Firms invest in technical training of their engineers, and if they are "lost" into management, the previous investments can be seen as going into waste. Further, new skills are needed and the training process has to be started again. The advanced design and mathematical skills a researcher has do not necessarily translate into solving problems in human relationships. Other required adaptations include frequent interruptions, heterogeneous work schedules, and increased interactions with people at all levels throughout the organization [35].

Managers in research organizations have to pass judgments on the scientific and technical feasibility of projects, their progress, relation to similar projects outside of the own organization, and the expected outcome [40]. Since each project has people, power, and vested interests attached, a manager will be under pressure from the debates on how to rank projects, key assumptions, reliability and accuracy of information, organizational capabilities, and so on. Dealing with power, politics, and peoples' feelings are as important as making rational resource allocation decisions.

1.4. The important questions

We purposefully leave out some research management issues, such as strategy formation, research portfolio decisions, or changing the structure of the whole organization. Instead, we concentrate on the personal process of becoming a manager. Brim [9] said

> There are three things a person requires before he is able to perform satisfactorily in a role. He must know what is expected of him, he must be able to meet the role requirements, and he must desire to practice the behavior and pursue the appropriate ends.

Concretely, we want to find clues to the following questions:

- What are the typical reasons a researcher becomes a manager?

- What does becoming a manager involve? What changes in the contents of the work? What changes in the relation to colleagues?

- How does one need to change or adapt? Am I ready and willing to make this change?

Once the decision to take a managing role is done, we also want to find ways of performing the new task well by finding answers to:

- Which new skills does one have to learn?

- How should one go about obtaining those skills?

2. Motivations for the transition

Watson and Harris [47] enumerate three basic motivations for entering managerial work. First, there are the *career managers*. Career managers have early on set out to become managers, and they actively manage their own careers. The second approach is *moving in* to management. Moving in involves a change of direction in one's career, and is less due to long term systematic planning than an opportunistic change. One is looking for a new role, possibly because of dissatisfaction with the old role or with oneself. The last approach is called *moving up*, and this is the most common route into management, and also the one we are mainly interested in in this study. Moving up is often described as following the expected path; instead of planning to become a manager, the career "emerges". A typical example is that a well performing researcher is promoted to a novice manager.

2.1. Herzberg's theory of motivation

Herzberg [17] constructed a two-dimensional paradigm of factors affecting people's attitudes about work. Each of the factors satisfies a class of needs. Primary needs represent the need for basic survival and the need to avoid discomfort and pain in work situations. These needs are satisfied by *hygiene factors* such as company policy, supervision, interpersonal relations, working conditions, and salary. According to the theory, the absence of hygiene factors can create job dissatisfaction, but their presence largely does not motivate or create satisfaction.

In addition to primary needs, people at work have growth needs, which are satisfied by *motivator factors*. These factors include five factors in particular that are strong determiners of job satisfaction: achievement, recognition, the work itself, responsibility, and advancement. These motivators (satisfiers) were associated with long-term positive effects in job performance, while the hygiene factors (dissatisfiers) consistently produced only short-term changes in job attitudes and performance, which quickly fell back to its previous level.

In summary, satisfiers describe a person's relationship with what she or he does, many related to the tasks being performed. Dissatisfiers, on the other hand, have to do with a person's relationship to the context or environment in which she or he performs the job. The satisfiers relate to what a person does while the dissatisfiers relate to the situation in which the person does what he or she does.

2.2. Career advancement

Advancing one's career is a common motivation to move up into management. Johnson and Sargeant [22] say that those individuals with a management title, or with responsibility for the management of a group, are almost always paid more, have access to more information, and control the performance reviews and hence salaries of their staff. One could argue that management should be subordinate to engineering, or at least on par with it, as the function of management is mostly to facilitate and control the "real" work, research or engineering. However, this is traditionally not the case. Since engineering is given lower status than management, many people trained as an engineer don't intend to stay in engineering for more than four or five years. Roberts

and Biddle [39] mention several disenchanted engineers who believe that the only way they could achieve the higher status they felt they deserved was to make a transition into management, regardless how personally desirable such a move might be.

Traditionally, the concept of a career has been something more than a mere job: for example, lawyers and managers have careers while secretaries and factory workers do not. While this view is still espoused by some [49], nowadays a more widely accepted definition is the unfolding sequence of a person's work experiences over time [4]. The vast majority of the research on careers concentrates on *organizational careers* [29]. Those studies have some assumptions, for example that the organizations and their environments are relatively stable, or that the organizational structures are inherently hierarchical. The concept of *boundaryless career* is fairly recent [5], and it aims to define the opposite of an organizational career. This concept is used in several situations, such as when a person moves frequently across the boundaries of separate employers, as is the custom in the Silicon Valley, or when the career, such as that of an academic, draws validation, information, and marketability from networks outside the present employer. Some gray areas between the boundaryless and organizational careers include situations such as when the hierarchical reporting and advancement principles are broken or when a person rejects existing career opportunities for personal or family reasons. In this study we use career to mean the organizational career, with the inclusion of the abovementioned special cases.

Johnson and Sargeant [22] interviewed 100 managers at all levels in five divisions of two companies and asked them about their original motives for making the transition into management. The answers were analyzed and they came up with three roughly equal-sized segments which they named extrinsics, intrinsics, and drifters.

- **Extrinsics** seem to be driven by external motivation factors such as higher salary and status. They feel that management is a means to progressing their career and it is important to increase their control and influence over the engineering process. They don't necessarily think they could be better managers than others, and are often indifferent to the idea of broadening their business experience. Therefore, the reward structure of the organization will strongly influence whether extrinsics decide to make a transition into management.

- **Intrinsics** are most interested in progressing their career to increase their influence over the engineering process, giving quotes such as "I love engineering and as a manager I can make sure it happens". Neither management itself, increasing business understanding, nor money or status are as important as internal factors.

- **Drifters** have few motives for making a transition into management, and appear not to be motivated by either internal or external factors. General comments from this group pertained to being in the right place in right time. While they don't seem to have any particular desire to become a manager, they aren't averse to the idea.

While the segment sizes vary between 26 and 38 per cent, the variations became more pronounced when managers were split into different groups according to another variable. For example, design and production engineering managers are more than twice as likely to be extrinsics than intrinsics or drifters, while research and development managers are twice as likely to be drifters than either two other segments. The low percentage of extrinsics (25%) could be explained by the higher status usually afforded

Figure 2.1. A dual career ladder [45].

to R&D over other types of engineering. When the split was done by the organizational level, the majority of team leaders were extrinsics, middle managers tended to be mostly intrinsics, while most senior managers are drifters. A possible explanation is that as the team leaders have not yet done a complete transition into management, money remains an important part of their decision, possibly because their minimum salary requirements have not yet been met. At the same time the more senior managers may not remember how important the extrinsic factors were at the time; they may have convinced themselves that it is not appropriate to have been motivated by extrinsic rewards. Of course, it may be that if mere personal ambitiousness does not correlate with actually being a good manager, some of the ambitious would-be managers may never progress to the higher levels.

2.3. Dual ladder system

The dual ladder system [22, 24, 37, 45] was designed to create a career path that would not require one to move into management in order to advance one's career. They are often found in organizations where research is highly visible or strategically important. The system was originally implemented to have approximately three technical levels before an individual had to select between the technical and managerial tracks. The logic is that it usually takes several years for both the company and the individual to recognize what direction they want the career to go. From that point on, the number of levels on each side should be equal, with equal rewards at each level. The ladders are actually best viewed as pyramids, because the number of positions decreases as the levels increase. The reward system usually focuses almost entirely on material rewards such as money, office size, company car, and stock options.

There are several clear reasons why a company would want or need to form a dual ladder system. If such a system exists, professionally oriented specialists have an alternative way of advancing their careers. A dual ladder system enables the company to retain their key technical competence as the specialists do not have to move into management if they really want to stay in science or engineering, so fewer will. Not only does one loose a competent specialist, one might gain a lousy administrator or leader since the person is not really doing a work that is their true calling. A second ladder seems to make the career advancement more fair, which leads to increased morale of the technical staff, and therefore to better retention of the technical personnel. It also

can make the company more attractive in recruiting. Graduate students and postdocs may feel anxious of the prospect that to be recognized in a company means that they would have to give up research to take a promotion, but existence of a dual ladder program may refute that concern.

Despite its many clear advantages, criticism has been voiced over several problems of how dual career ladder systems have been implemented in practice.

- Titles on the technical track do not promote the same respect as those of the managerial track. Titles such as "vice president" or "department head" convey an image of success and power, titles such as "specialist", "principal scientist", "research associate", or "fellow" are more ambiguous and unclear, at least to people outside of a specialist's peer group [24].

- Top managers are not willing to devote additional resources to the professional title of the ladder so that reward programs can remain equal [37]. The perquisites, resources, financial and symbolic rewards are sometimes higher for people on the managerial ladder compared to the same level on the technical ladder. There was even a case where a company (3M) was sued for not living up to the promise that the technical ladder would be equally compensated [45].

- Movement on the professional side is typically time-based, that is, you don't get promoted unless you have served some time in the previous position. Movement on the managerial side, on the other hand, may be more a matter of being in the right place at the right time and has typically a faster cycle [45]. A related problem is that promotions on the technical track are based on the past performance, while managerial promotions concentrate on future promise and potential [24].

- Unclear definitions of responsibilities between the levels lead to poorly-defined career paths [22]. Inherent design problems create unequal power relationships between the two ladders. For example, professionals sometimes have to report to managers at the same or lower levels of the career ladder [37].

- Movement up the managerial ladder usually leads to increased power and influence, allowing resources to be more easily mobilized to carry out manager's needs and demands. In contrast, advancement up the technical ladder usually increases the autonomy to pursue one's technical interests, sometimes at the expense of organizational power and influence. This may lead to feeling of becoming isolated from the organization [24].

- A fast way to lose respect for the technical track is if it is used as the dumping ground for failed managers. If less successful, unnecessary, or incompetent managers or people with many years of service but less technical contributions are given a high grade level on the technical track, the whole ladder becomes devalued [24, 45]. Also, if the technical ladder is mostly used to pacify technically competent people lacking diplomatic and management skills, it may turn the technical track into a consolation prize for those "not good enough to be a manager" [24].

As we see, a dual ladder system is not easy to implement so that all the original goals could be reached without creating new problems. However, lately many of these pitfalls have been recognized and steps have been taken to improve formal structures of the dual ladder systems. Measures include policing practices to prevent the dumping

ground abuses, making ladders more comparable in terms of compensation and number of people at equivalent hierarchical levels, and greater involvement in decision-making and technical strategy formation.

However, one shouldn't automatically presume that everybody is dead set on advancing along one or the other branch of the ladders. When Katz and Allen [24] asked 2500 engineers and scientists about their preference over a progression up the technical ladder or the managerial ladder, or the opportunity to engage in those challenging and exciting research activities and projects one is most interested, irrespective of promotion, only one fifth preferred advancement along the technical ladder and one third preferred the management path. The majority preferred interesting projects regardless of promotion.

In the same study Katz and Allen tried to find out whether the preference of the technical ladder depends on the nature of work (categorized as research, development, or technical service), or on the level of education. The result was that the nature of work had little or no correlation on the preference of the technical ladder over the managerial one. However, the level of education did have a strong correlation: those with PhD's are much more likely to prefer technical ladder than those with lower level of education. It is likely that some self-selection is involved here. Advancement on the technical ladder requires a high level of technical competence, and those with higher level of education are able to advance more easily along that track. For people with lower level of education the choice may be a case of "sour grapes": advancement along the technical track may seem to require too large efforts, e.g., in terms of further education, and take too long. The managerial track may seem an easier and faster way to higher status and pay.

Many scientists may think that choosing between the ladder branches, or switching the branch to management, is not a big step since management is merely an additional set of responsibilities requiring new skills to be added to one's professional repertoire. This is a mistake. Management is an entirely different career from that of the individual contributor in science.

2.4. More control over the research

Another motivator for taking up aspects of management is to have more control over one's current work. Most researchers actually do want to share aspects of the managerial and executive authority, when it has an effect on their research activities. Having control over budget would mean that one could always order the right kind of equipment without needing to distract oneself and waste valuable time by convincing others of its importance. Having freedom to choose the methods of conducting research is similarly satisfying, as is the freedom of choosing the research topics. For a researcher who knows what she wants, being able to hire more people may enable her to accomplish much more than she could alone. Additional satisfaction can be obtained from forming a cohesive and productive team, as well as from guiding and raising a new generation of researchers. As a head of a successful team one can more effectively build a strong professional reputation within one's own organization and within one's field outside of the organization. However, this authority and power do not come for free. There is always accountability and some extra administrative work included. We will cover more of these issues in the next chapter.

2.5. Does your personality type fit management?

Sapienza [40] claims that some personality types are better suited for management than others, and that in any case being an effective leader begins with a better understanding of oneself and one's own strengths and weaknesses. She uses a model proposed by McClelland [32] which states that every person has a unique ordering of three work-related needs:

- **power**, a need to influence a group of people to attain a desired outcome;

- **achievement**, a need to set an individual goal and work until it has been reached; and

- **affiliation**, a need to develop and maintain good interpersonal relations with co-workers.

The relative importance of these needs is a stable part of personality and can be used as a predictor of long term behavioral patterns. People with high need of power are more likely to be able to introduce radical organizational changes and innovations, and they are likely to seek positions of leadership and to be impatient with positions that don't allow them to influence others. People with high need of achievement are critically important for the technological and scientific development of the organizations. They are not generally interested in managing others, and are much more interested how well they are doing rather than how well the organization is doing. Finally, people with high need for affiliation perform best when their work requires them to satisfy their need for maintaining positive working relationships, as is often the case in middle and project management. However, they are anxious about how well they are liked, thus they are likely to favor their own small group over the norms of the larger organization.

Understanding your primary work-related need may give you a hint whether you would like to work in a management position. A general familiarity of the basic types of work-related needs can also be useful for understanding what motivates other people, especially your subordinates, and help in assigning them suitable tasks. Unfortunately detecting which needs motivate people is not easy to do, but by listening carefully to people and observing the patterns of their work behaviors over time it is possible.

3. What is at stake?

Moving into management does not mean only gaining an increased salary and higher status. The content and scope of the work, as well as the values and self-image, are at stake. In this chapter we take a look at the typical fears of a manager candidate, as well as those things one stands to loose.

3.1. A researcher at heart

Many who choose science or engineering as a discipline are inherently oriented more to technical and professional objectives than organizational goals, and therefore prefer technical jobs [42]. Technical professionals value the freedom to pursue their own technical interests, the responsibility for making judgments in their areas of expertise, and the exercise or organizational control through knowledge, logical arguments, and collegiality. Managers, in contrast, desire upward mobility in the organizational hierarchy. They do this by focusing more on the achievement of company objectives and the acquisition of organizational approval and promotion. A true professional would much rather have his ability than his authority recognized [24].

Engineering requires a large amount of technical training so engineers and scientists may see a transition to management as a waste of their personal potential [18]. There will be no more as much time for research or engineering. Instead, one has to spend some time in learning to new skills needed in management. A big portion of time is spent in administrative activities that a researcher may perceive as overhead, such as

- budgeting people, money, and office space,

- generating reports and proposals of research projects instead of doing the actual research,

- managing people, their feelings, and collaboration so that they can be productive researchers.

With the increased organizational power that a manager has comes also accountability. With a greater control (and use) of resources, one is also expected to be able to show commensurately more results. One must yield some of one's independence. For example, there are going to be more scheduled and agreed deadlines to meet. One has to listen to the views of others and compromise where there are differing views. Since one is involved with the decision-making and those compromises, there is no moral license to engage in a guerrilla warfare after the decisions are made.

A new manager is often tempted to juggle the tasks and identities of a manager and a researcher. Since there are so many demands on time and attention, it is not possible to maintain and increase one's knowledge of the field in as deep level as before. Trying to do two jobs at the same time is very demanding, and both jobs are likely to suffer. Additionally, while there is no time to get immersed with details, one needs to cover a wider spectrum of things. If a researcher wants to understand how things work from the first principles and from ground up, and is of the opinion that "the devil is always in the details" to actually get something to work, it can be difficult to leave the details to others and only cover things at a high level of abstraction.

3.2. The price of management

One aspect of being a manager that new managers often do not recognize is the "price of being a manager", i.e., loneliness [6]. The higher one climbs in the management hierarchy, the fewer peers one has to talk to, the more restraint one has to exercise over what one says, and the more lonesome it becomes. One has hold back, think more carefully before talking, and leave some things unsaid. If one does not accept this and tries to act like "one of the guys", one is at a danger of loosing the respect of the people one manages. Keeping a distance from the team may seem to be at odds with open communication, being approachable, and equal teamwork. However, employees want to look up to the boss, they want to feel that they can turn to him or her for necessary decisions. It is better, if not easier, for a manager to be respected rather than liked; in fact the managers who are found to be most effective are usually categorized by their subordinates as "fair but firm" [33]. Therefore, if the downside of management is loneliness, the upside can be a nice feeling of respect. Being a manager often means being a figurehead, being set up on a pedestal. One has more visibility and has both the opportunity and responsibility of setting up a good example.

3.3. Socialization

Organizational socialization is a term from sociology that refers to the process by which a person learns (or is taught) "the ropes", or the values, norms, and required behaviors expected from a person in a particular organizational role [9, 28, 30, 41]. That is, one needs to learn what are the basic goals of the organization, preferred means for attaining these goals, the basic responsibilities of the role, the behavior patterns leading to effective performance in the role, and a set of rules or principles for maintaining the identity and integrity of the organization.

Though this process is continuous throughout one's career, it is especially intense when one switches organizations, departments within an organization, or from one rank level to another. There are three main phases associated with any of those "boundary passages" [28].

- **Anticipatory socialization** refers to the degree to which a person is prepared, prior to the entry, to occupy a new position.

- **Entry** deals with the "reality shock" when one actually begins at the new position and encounters the real nature of the assignment. If the expectations were unrealistic and differ a lot from the reality, disillusionment is a likely outcome.

- Finally, **metamorphosis** deals with the personal change necessary to continue acting in the new task. According to Kelman [25] there are three main alternatives how this change can take place. *Compliance* means that one accepts the organizational demands in order to gain specific rewards or to avoid certain punishments. The term *identification* is used when a person accepts influence because he desires to establish or maintain a satisfying, self-defining relationship with another person or group. Finally, if one feels that the required behavior and ideas behind it are intrinsically rewarding, one *internalizes* the role.

The "price of membership" does not include only learning new skills, behaviors, and attitudes, it may also mean that one must relinquish some old ones. One of the

main variables in socialization processes concerns the degree to which a socialization process either confirms or disconfirms the previous identity of a person [30]. An *investiture* process affirms the newcomer that the values, skills, and attitudes he or she has are valued, and the newcomer's self-image is enhanced. For example, one can imagine a new engineer joining an engineering department of a company experiencing the socialization process as an investiture one, as it is likely to be in line with the previous training and one now has a chance to use the skills one had to work for long and hard. The other end of the continuum is called a *divestiture* socialization process, which seeks to deny and strip away certain personal characteristics of a newcomer. In a divestiture process, especially common in the military or in religious organizations, one may have to sever old friendships, do menial tasks one feels are underneath one's dignity, even undergo harassment from experienced members. The process may actually have been designed to shatter the candidate's previous self-image so it can be rebuilt and replaced with a new, more suitable one. While an investiture process affirms a person, a divestiture process remolds him.

Most professional training programs, such as engineering, are essentially divestiture of nature. The programs require a candidate to undertake a long-term sustained hard effort in order to pass a set of robust tests. The process, when voluntarily undergone, serves to commit and bind the person to the values of the organization. It should be noted, however, that such tactics serve as an identity-bestowing as well as an identity-destroying process; coercion does not have to mean damaging the person. Indeed, they can be a device for simulating many personal changes that are evaluated positively by the person and others.

All this helps to explain why professionals appear to be so deeply and permanently socialized. Once a difficult divestiture process has been completed and a person has constructed a new identity, there are strong forces maintaining that identity. One of the strongest of those forces is perhaps the fact that the sacrifice involved in building the new identity must be justified and gets bigger since it partially destroys the old one. Additionally, since the self-esteem of a person having successfully completed a divestiture process rests on the new self-image, the future experiences will be organized so the self-esteem can be enhanced or at least maintained, making the image a self-fulfilling one. Therefore, for a researcher pondering whether to move into management, at stake may be nothing less than one's self-image and self-esteem.

3.4. Making a choice

Given the changes that are likely to happen, one now has to make a decision whether or not to go into management. Changing one mind after the reality shock has struck is more costly in many ways. The concrete questions one has to ask oneself include: Do I really want this? Am I willing to make the sacrifices in return of the increased money, status, and power? Can I pay the price of management, the relative solitude, being at a distance from many of the other researchers? Or was my true calling actually always getting things done, though not necessarily by doing all the work myself?

Schein [41] writes that the socialization of a person does not happen in big, discrete steps. Instead, the changes in values, ways of thinking, and the self-image take place gradually, in small steps. This process has some analogies to the story of boiling a frog. If you throw a live frog into a pot of boiling water, the change in temperature is too big, and the frog will surely attempt an escape. However, if the water is tepid in the

beginning, and the temperature is only increased gradually, the frog will happily sit in the water, all the way until it boils to death. Similarly, the change into management and the accompanying socialization and change of self-image and values can be gradual. A researcher may begin to get more freedom and responsibility of her research. She then begins to guide and supervise, first one or two more junior researchers, and later leads a whole project. Incremental steps may take her to become a team, group, or laboratory leader, even the head of the research corporation of a major corporation. At each step the immediate involvement with hands-on research diminishes, and the organizational responsibilities and leading of people increase.

Will you boil into death when you notice you aren't doing individual research or engineering work any more? Or will you get energy from the steaming water around you, later noticing that being a frog was only a stage on the way to becoming a fire salamander? Is there a pot of gold at the end of the management ladder? Or, is it fool's gold? The rewards can look great from a distance, yet you might be disappointed if you find management less satisfying than doing good science. It is better for both the organization and the individual that this question is considered before taking the leap.

4. Learning to be a good manager

The prerequisite for learning to be a good manager is the recognition of the need to learn. If one thinks that good managers or leaders are born, not made, one is not likely to learn much more than what one already knows. Granted, a big part of what a good manager does may have been learned already in childhood. One may have had good role models, for example one's own parents. School and various sort of free time activities, such as team sports or boy or girl scouts, teach valuable skills of how to get along as a group of people and how to get that group to work towards a common goal. Most non-managers, and many managers, have a hard time defining what it is that makes a good manager in a deep, non-trivial sense. Though one might recognize good and bad management when one sees one, that is not good enough for making a person a good manager when he or she actually tries to do that.

In this chapter we first attempt to find out which are the skills a manager should learn. We continue by taking a look at various alternatives of acquiring those skills. We discuss management styles and recognizing one's own style, and conclude with some strategies for obtaining leadership as a new manager.

4.1. What to learn?

4.1.1. Components of management competence

Williams mentions two different approaches to conceptualize management competence [48]. The first approach (personal competence) concerns the identification of characteristics or orientations that differentiate effective managers from less effective managers, that is, the latent or potential capability of individuals to act as managers. The second approach (occupational competence) measures what managers actually do rather than what they can do. In practice, there is not much difference between the approaches since personal competence is usually a prerequisite for competent performance, and mere potential without manifestation gives the same outcome as no potential. Williams goes on to list various models of management competence. All the models require the manager to have the so-called basic skills such as literacy, numeracy, and basic analytical decision-making skills. They also emphasize the importance of the situation or context in which a manager practices, they speak of meta-competences such as the ability to adapt and apply one's knowledge and skills to various situations or to understand change and act proactively instead of just reacting to a changing environment. Finally, the importance of personal factors such as motives, traits, self-image, and social role is also acknowledged. However, these competences are so generic as to be of little use when one tries to apply them in practice.

Williams asked several science graduates and their managers to give an opinion of the importance and the feeling how well science education had prepared them for various managerial tasks [48]. The list of skills covered seven personal, transferable skills (leadership; communication; working in groups; extracting information, analyzing it, and presenting the results; personal effectiveness; monitoring performance; project management) and seven traditional academic areas (organizational awareness; corporate/business environment; marketing, market research, sales and promotion; information technology; production and operations management; personnel/human resource management; financial management). The clear consensus was that the competencies
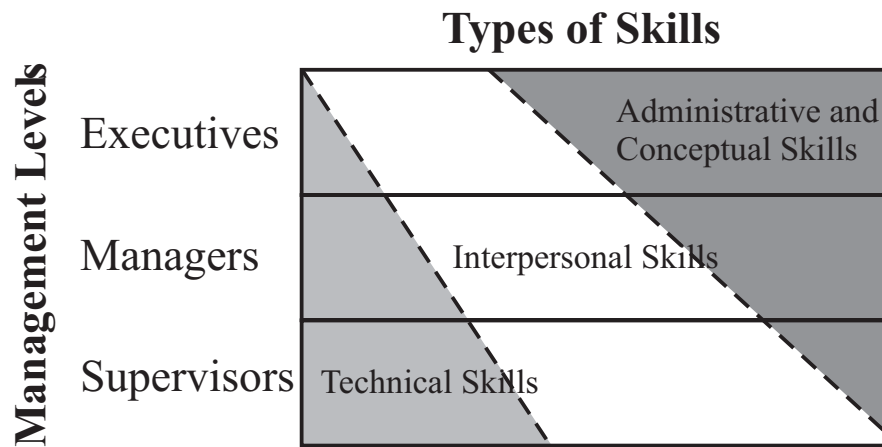
Types of Skills

Figure 4.1. The managerial skill mix.

representing personal transferable skills were rated as more important, and the gaps between preparation and requirements were larger than in the more academic management education subject areas.

4.1.2. The managerial skill mix at various management levels

There are three main groups of skills a technical manager needs, and the relative importance of the skills varies with type and level of management task you have (see Fig. 4.1) [6]. The first group consists of the technical skills. In our case, we can assume that a researcher turned to a manager has a good hold of them. Some important metalevel technical skills include the ability to develop and apply task-related methods and techniques. One also needs to have a general understanding how the technical activities of one's department relate to the other divisions and overall goals of the company. The technical skills are most important at lower management levels but their importance tends to decrease at higher levels in the organization. The second group is purely managerial skills relating to administration, organizing, planning, directing, and controlling. The core administrative skills include the ability understand and create concepts and keep track of events; the capacity to collect, evaluate, and process relevant information; the ability to distinguish alternatives and make a decision; and being able to direct others and communicate to them the reasons behind decisions and actions. The relative importance of these skills increases at higher levels of management. The single most important set of skills at any level of management is the interpersonal or people skills. For effective management one must interact with, motivate, influence, and communicate with people.

- Budgeting, resource management.

- Time management: so many different demands of your time.

4.1.3. Managing teams of people

According to Bennis [7] the four essential skills of a successful leader are

- management of attention — the ability to communicate to others and obtain their commitment;

- management of meaning — the ability to make goals apparent and tangible to others and align people with them;

- management of trust — displaying reliability and constancy and conveying what one stands for;

- management of self — the ability to know one's skills and deploy them effectively.

People are empowered if they feel that they are significant, that learning and competence matter, that people are part of a community, and that work is exciting. Empowered people are pulled rather than pushed towards a goal.

Delegating tasks

One of the most valuable skills for a manager to have is the ability to delegate. According to Badawy [6] a manager should never undertake what he or she can delegate — one can only grow as a technical manager if one can delegate, and the subordinates expect their boss to do so. Successful individual researchers, especially at the post-graduate level, have grown accustomed to do things themselves rather than expect others to do them. As it is usually the successful researcher that is promoted to management, the manager may believe that he or she can do some particular job better than anyone else in the team. Though this belief may or may not be justified, there are several compelling reasons to delegate nevertheless. For example, there are the time constraints, there is just not enough time to do everything on one's own. In the case that nobody else in the team is not as competent in that particular task, never delegating the task also makes sure that the team members do not learn to become better. Delegation of a challenging task is also an implicit expression of trust on subordinate's skills or at least of the ability to learn the task, which is good for the morale. Developing the will to delegate may require a change in the manager's attitudes, behavior, and the assumptions about people working for him. One might even have to force oneself to delegate task to one's subordinates. In any case, delegation is one of the most important skills for a technical manager.

Interpersonal challenges

Gemmill and Wilemon [15] did a study on the interpersonal concerns of team leaders and interviewed 100 project team leaders. The leaders were asked about the major sources of frustration when leading their teams; the most difficult team issues, how they felt about them and how they tried to deal with them; the reasons why they misread their teams and ways of identifying emerging team issues; and of the fears and apprehensions about being a team leader.

The biggest source of *frustration* was apathy and lack of commitment of their team members. Rather than seeing the issue as a team-produced or organizational issue, many of the leaders blamed themselves and wondered if they had done something

wrong or not enough with their apathetic team members. The second most often mentioned source of frustration was "wheel spinning", seemingly unproductive time. A typical example would be when the leader would hope that some simple task could be solved quickly, people spend hours on airing differing views without getting any consensus in the matter. Another source of frustration was the feeling of powerlessness, for which there were two sources: that over a team member involvement (not only due to apathy) and that over external resources, information, and cooperation. More than half of the leaders reported frustration over the lack of openness in dealing with "real" but seemingly "undiscussable" matters, such as a person opposing a proposal, not really because of the attributes of the proposal, but merely because he or she doesn't like the person making the proposal.

When the leaders were asked the most *difficult* issues faced when leading a team, the most difficult issue was the same as the most frustrating issue: team apathy. The typical response to this by the leader was confronting the members about their level of commitment. Many also knew from experience the risks of confrontation, namely withdrawal of the team member, or even teamwork sabotage. The second most difficult issue was when the leadership, authority, or competence of the leader was challenged. Team leaders noted that they often became angry when challenged, but generally did not express it openly for fear that they would be seen as authoritarian, closed-minded, or as someone who "couldn't take it". Sometimes being able to detect that the attack was really against the organization rather than the leader as person would help. Over a quarter of the leaders reported difficulties in dealing with conflicts or competitive power struggles among team members and feeling helpless about the situation. The attempted solution was often smoothing over the issues or building alliances outside officially scheduled meetings. Here the risk of that tactic was seen as polarization of the groups into warring factions. Finally, one fifth reported that having to deal with an overly dependent team member that requires constant direction setting and follow-up and that lack initiative in responding to important tasks. Many noted that they became irritated and sometimes expressed anger and impatience, but at the same time were concerned that they would be seen as insensitive or that the member would withdraw from the team.

The top five reasons why leaders said they *misread* events within their teams were

1. not recognizing interpersonal conflicts between team members,

2. not being aware of hidden agendas on part of team members,

3. not understanding team member motivations,

4. lack of awareness about team member expectations, and

5. not listening accurately enough to team discussions.

On the other hand, the top ways team leaders used multiple sources to *identify* emerging team issues were

1. giving attention to non-verbal communications (facial expressions, body posture, etc.) of team members,

2. trying to listen for hidden meanings,

3. sensing energy levels within the team,

4. observing influence patterns and who talks to whom between team members, and

5. having one-on-one discussions outside of team meetings.

The *fear* about being a team leader most often mentioned was of dominating the team, of overpowering less-assertive team members. Many leaders also were concerned about making a mistake or appearing incompetent and that they might not be able to regain credibility afterwards. Finally, over half expressed fear about losing control of the team, i.e., being unable to lead, direct, or influence their teams.

Based on their findings, Gemmill and Wilemon gave several recommendations. Team leaders often feel that their problems with their groups are somehow special, not typical, especially since in most organizations discussions of personal apprehensions and concerns is not encouraged. The fears may lead to additional communication problems if leaders deny them and become paralyzed or defensive. Acknowledging the fears and knowing that most leaders share these problems and feelings can be relieving. Leaders should pay attention to non-verbal behavior in order to "read" what is occurring in their teams so they can diagnose possible problems and deal with them early enough. Testing assumptions by asking questions leads to better understanding, and sends a signal that the leader is interested and wants to understand, which again engenders trust in the leader and helps create openness in the team. The most common fear the leaders expressed was of dominating their team, yet at the same time leaders were fearful of losing control of their teams. Learning mechanisms of balancing the correct levels of control would then clearly benefit leaders. In general, the best way to discover and deal with potential problems is open group discussions. Though there are risks in initiating communication about emotionally charged topics, a far greater risk lies in repressing or ignoring them.

Keeping up motivation

An important component to job satisfaction is that the work should not be too easy or too hard. The job should feel significant. Also the rewards should be according to expectations. Of course, when the expectation is higher than the realization, the person becomes disappointed or angry, and job satisfaction suffers. However, a reward much larger than expected may be valued less than a reward that the recipient feels is appropriate. Climate of participation is also beneficial for maintaining motivation. One increases the sense of control of employees by allowing them to participate in decisions that affect them, such as when to start work, what to study, and when to study it. Management by objectives is desirable since it enables the supervisor and subordinate to sit down periodically and agree on milestones, goals, or values. Maximal motivation is obtained when the goal are specific and difficult, but attainable. The review of the goals in turn allows for feedback, and it also allows for discussions of why the goals were not reached and for congratulations when they were attained.

Maintaining innovativeness

The innovativeness process includes according to Jain and Triandis [20] (1) identifying the market need or technology opportunity, (2) adopting or adapting existing

technology that satisfies this need or opportunity, (3) inventing (when needed), and (4) transferring this technology for commercialization. An innovative environment is one that accepts failures. If one is punished for failures, one soon stops even trying to reach new and uncertain goals. Also, successful people have encountered more failures than those who are considered being failures themselves. In research terms, if all experiments come out as expected, this is an indication that the research is too conservative.

As important as accepting failures is tolerance for disagreement. Avoiding or rejecting those who disagree with you and only seeking those who agree with you may result in groupthink [21]. Active avoidance of public disagreement may result in decisions that many, sometimes even all of the participants, privately disagree with while thinking they are the only ones to harbor dissent. To avoid groupthink one needs to bring fresh perspectives into the group. This may even mean appointing an official devil's advocate whose role is to shoot down research designs and to warn about disasters that could result from a particular course of action. Therefore, a manager has to watch out more for subservient researchers than for unruly ones. When critical analysis of a manager's proposals is not made early, but the suggestions are taken as commands without discussion and analysis, research excellence is bound to suffer.

While disagreement should be tolerated, fostering it too much is detrimental to innovation. 3M, for example, expresses this idea with their eleventh commandment of "Thou shalt not kill ideas". Brainstorming is a commonly used method for raising innovativeness of a group and it explicitly forbids criticism and judgment, at least in the early phases of the process. In brainstorming, you start with collecting as many ideas as possible. You are encouraged to build on the ideas of others, however, there should not be any discussions, let alone criticism (including groaning or laughing) at this stage. Only later the ideas are combined and the best ones are selected. Groupthink is avoided by allowing all the ideas and sides to be aired without the fear of ridicule.

Another killer of innovativeness is the Not-Invented-Here (NIH) syndrome which is defined as the tendency of a stable research group to believe it possesses a monopoly of knowledge in its field, thereby rejecting new ideas from the outside [23]. Communication with the wider scientific community, other researchers within the organization, the user community, and marketing personnel within the organization is crucial for a successful and effective innovation process. In NIH syndrome, the critical component is not the level of communication, but the tendency to ignore and become increasingly isolated from sources of information and ideas. Some strategies to avoid and eliminate NIH syndrome include bringing new people into the group, even if only temporarily, in form of visiting scientists or interning students; encouragement of researchers to interact with the wider scientific community by participating in research seminars and scientific conferences; even establishing a sabbatical leave program.

Additional pitfalls

Badawy lists a few additional reasons why people with engineering or science background might fail as managers [6]. Having been trained in hard sciences, where exact measurements is one of the natural beauties of the scientific method, they are more comfortable working with things that can be objectively controlled and measured. Managers, on the other hand, must rely on intuition and judgment in dealing with attitudes, biases, perceptions, and feelings. The fact that these intangible variables

cannot be objectively measured, let alone controlled, can make a technical manager's job thoroughly frustrating. The thing to learn is to stop insisting on a yardstick to measure everything.

Another related problem could be paralysis by analysis: the tendency to wait for all the information to be in before making a decision. All real decision making involves risk, as a manager you will never have all the facts in objectively measurable form. Not being able to adjust to this results in managerial anxiety. Finally, many engineers and scientists are introverts rather than extroverts. Though introversion is often associated with creativity, and creativity is advantageous for an individual researcher, managing a team is an extrovert activity. One would then have to, in addition to learning all the other manager's skills, have to try to change one's "long wolf" nature. Though all of these are clearly possible pitfalls for any new manager, Badawy doesn't offer further proof that engineers and scientists would in fact be more susceptible to them than anyone else except for some stereotypes.

4.2. How to learn?

Studies show that while people do 70% of their development by doing, 20% of their learning by observing other people, and only 10% of their learning from courses or books, the development plans usually have exactly the opposite order of these three components (10%, 20%, and 70%, respectively) [16].

4.2.1. Formal learning

A widely used way to learn more about management is to join a management program or course, such as an MBA program. The contents and emphasis in management education has been different at different times. Thomas has proposed four distinct historical stages for management education [46].

1. Pre-paradigmatic stage (– 1900): on-the-job education, informal, minimal involvement of universities.

2. Old paradigm (1900 – 1960): management education in universities, but rather as a part of general education useful for management and administration tasks rather than a profession.

3. New paradigm (1960 – 1990): management education in universities, with the idea to transmit scientifically produced information, increasingly produced in the specific context of business management.

4. Post-paradigmatic stage (1990 –): management education still mostly within universities, the emphasis is on creativity, meta-learning, and problem solving skills.

It appears that the academic community is moving away from mostly offering scientifically validated models of various relationships and objective systems towards integrating managers' experiences of the complex nature of the business reality with heuristic guidelines [36]. Nevertheless, the formal management education still mostly teaches

Figure 4.2. An example what mentoring is not.

those traditional academic subjects such as macro economics, business strategy, financial management, and marketing, the skills that according to Williams's studies [48] are of secondary importance to the skills managers feel they need. Similar sentiments were shared by the managers interviewed by Watson and Harris [47]: the best contribution of the management programs was often deemed to be the chance to reflect on one's own experiences and share the experiences of the other participants of the course. Peltonen [36] acknowledges as the main contribution of the post-paradigmatic stage of business education the realization of this and offering managers time and meta-skills with which they can autonomously, from time to time, reflect on their own experiences and critically contrast them with various management models, truths, and ideals that they are being offered.

4.2.2. Mentoring

Mentoring is a way of developing an employee (mentee) by pairing him or her with a more experienced employee (mentor) who will teach, coach, councel, sponsor, and encourage the mentee [34]. A mentor is an individual, usually older, always more experienced, who helps and guides another individual's development. Fig. 4.2 shows a cartoon displaying what mentoring is not supposed to be. The original Mentor is a character in Homer's Odyssey. When Odysseus, King of Ithaca, went to fight in the Trojan War, he entrusted the care of his kingdom to Mentor, who also served as the teacher and overseer of Odysseus's son. Mentoring began permeating the corporate world in the 1970s in the USA; its objective is the efficient communication of professional experience and expertise as well as analysis between the adviser and the one being advised. Mentoring has been found to accelerate the intellectual, occupational and personal growth of employees, and, consequently, also their career advancements. At the same time, the mentoring activity tends to increase overall job satisfaction and motivation.

Mentoring is related to coaching, but there are several clear differences. While coaching is something managers must do for all their staff as part of their job, the mentor is not the direct manager of the mentee. Coaching focuses on developing a person within the current job, is initiated and driven by the person's manager, and ends

as the person moves on to other job under other line managers. Mentoring, on the other hand, is focused on professional development that may be outside of the mentee's area of work, may be initiated by the mentor, mentee, or the organization, and may continue across job boundaries.

Your company may have a formal mentoring program, in which case a mentor may be assigned to you. Otherwise, you can try finding a mentor on your own. Reh [38] gives some advice how to do it. First you should look whether you can find an individual who you admire and respect, someone who has always impressed you with their insight and perceptiveness. It could be a Vice President in a different division, or even an older individual who isn't currently a top executive of your firm, but who you know has lots of experience. Approach that individual and ask if they would consider being your mentor. Let them know what why you selected them and what you hope to learn from the association. You can also discuss amounts of time to be committed and what you will contribute. There's little you can lose by this: even if they decline to be you mentor, and few will, they will be flattered that you asked.

4.2.3. Learning from experience

Learning agility, i.e., ability to learn from experience, is different from how intelligent a person is and it is more related to long term success than raw intelligence or IQ.

Sink or swim

Watson and Harris interviewed 40 managers about various aspects of becoming a manager [47]. Most of those managers used the phrase "sink-or-swim" to describe their managerial learning process, or at least parts of it. One meaning for that phrase was that management is felt to be a practice, an art, rather than a science, and you mainly learn it through practice. Nobody ever learned swimming without entering the water, and similarly, you won't learn management only by reading books or attending courses. You mostly learn from trials and errors, and observing what good managers (or swimmers) do, and what gets them into trouble.

Another way of understanding sink-or-swim is the way (too) many companies relate to management learning. The organization takes a laissez-faire attitude, and takes very little real action. The manager is mostly just given specific performance targets and the manager is supposed to take ownership of his or her career, developing it and learning using any resources that can be found, whether external or internal to the company. Sink-or-swim approach is especially common among technical project managers. The problem is that in the case of sink the results can be catastrophic for both the company and the individual involved. Typically, throwing an inexperienced project manager at a project without proper support and education lead to exceeding of budgets and time tables. Even in the case of swim the experience is likely to be much more frustrating than really is necessary.

The managers interviewed by Harris and Watson identified the sink-or-swim as the predominant approach to career development in British companies. Storey *et al.* [43] did a comparative study on British and Japanese career development practices, and concluded that the much more systematic and integrated training approach of Japanese employers led to a much better return from their investment in their managers than
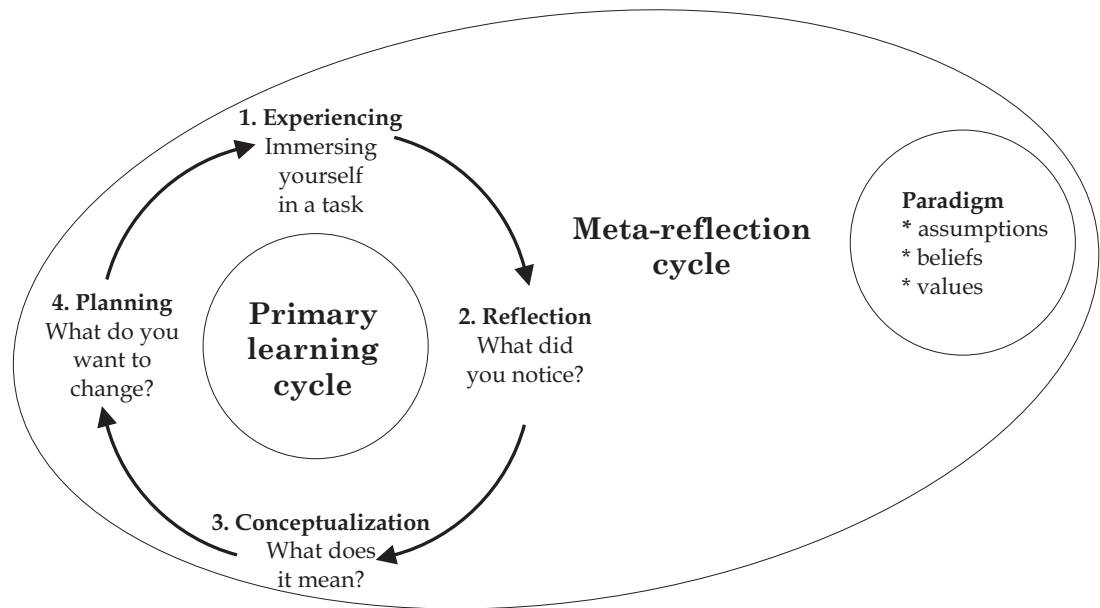
Figure 4.3. Kolb's learning cycle. The primary cycle consists of doing, thinking, interpreting, and planning better actions, all within a set of given assumptions and beliefs. Every now and then one should also reflect on the basic assumptions and values and revise them if needed.

the British employers get. Even if the practice of is most important component of management learning, which again is akin to learning swimming, a novice swimmer benefits from reading books about swimming, taking classes, being coached, and being given a direction toward which to swim.

If the management knowledge is not best understood as a science, maybe it could be better understood as a form of "cookbook knowledge" [10]. The best managers would then be like the best cooks: they take into account the recipe books of experts, but they also develop their own style and recipes, taking into account their own environment and the locally available spices and ingredients.

Learning theories

Actively learning from experience is not easy, and it requires more active attitude than learning from a book or a course. While formal learning usually comes with clear goals and structured contents, learning from experience requires introspection and reflection, one needs to evaluate whether a particular situation went well or badly, actively wrestle meaning from the experiences, analyze successes so they can be repeated, and develop rules of thumb to avoid failures.

Kolb presented a model for learning from experience called the learning cycle [26]. The basic idea of the learning cycle is that the more often we reflect on a task, the more often we have the opportunity to modify and refine our efforts. The learning cycle consists of the following four stages (see Fig. 4.3):

1. **Experiencing** or immersing oneself in the doing of a task. The person is usually not reflecting on the task as this time, but carrying it out with intention.

2. **Reflection** involves stepping back from the task and reviewing what has been done and experienced. The skills of attending, noticing differences, and applying terms helps to identify subtle events and communicate them clearly to others. One's paradigm (values, attitudes, values, beliefs) influences whether one can differentiate certain events.

3. **Conceptualization** involves interpreting the events that have been noticed and understanding the relationships among them. One's paradigm again influences the interpretive range a person is willing to entertain.

4. **Planning** takes the new understanding and translates it into predictions of what actions should be taken to refine the way the task is handled.

It is quite important apply the learning cycle continuously. If one waits until after a task is completed, there is no opportunity to refine it until a similar task arises. However, continual reflection leaves the person spending more time on thinking than getting the task done. In general, the learning cycle should be used during initial framing of a problem to see whether past experience may offer an approach, during natural breaks in tasking such as the end of meetings or workdays, when progress is noticeably going well or poorly, and at the occurrence of a crisis that disrupts the process.

The advantage of the learning cycle is that it enables one to learn from experience and thereby improve performance. This, however, may not be sufficient when the assumptions and beliefs on which the learning is based are outdated. It is possible for one to complete all the stages of the learning cycle, while still perceiving, interpreting and acting in a biased way. Periodically, one should question the model itself, look for exceptions to the rule, and challenge the dominant paradigm to determine whether it still holds.

Honey and Mumford [19] developed a theory of learning styles based on Kolb's theories. They defined four learning styles, each associated with one of the stages in the learning cycle. In the same order as the stages of the learning cycle above, the styles are activist, reflector, theorist, and pragmatist. Different people learn in different ways, and Honey and Mumford developed a questionnaire that can help you discover your preferred learning style and hence the stages of the learning cycle at which your learning is most effective. It helps to be aware of your own preferred learning style, however, you should also know the other styles and aim to use them all. Here are some activities that work well with each learning style.

- **Activist:** brainstorming, problem solving, group discussions, puzzles, competitions, role plays.

- **Reflector:** paired discussions, self-analysis or personality questionnaires, observing activities, feedback from others.

- **Theorist:** models, statistics, stories, background information, applying theories.

- **Pragmatist:** time to think about how to apply learning in reality, case studies, problem solving, discussion.

Argyris and Schön studied conscious and unconscious reasoning processes and how they relate to learning [3] (there is an excellent overview on the topic available online [1]). We'll use an example to illustrate their single and double loop model of learning, illustrated in Fig. 4.4. Let's assume that one of the governing values of a person is
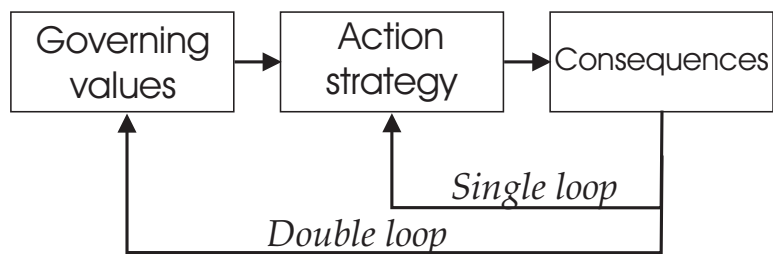
Figure 4.4. The single and double loop learning model.

to suppress conflicts whenever they occur, and at the same time to appear competent. Her action strategy might be to avoid discussion of the conflict situation. The intended consequence is that the others would eventually give up the discussion, which would suppress the conflict. Further, by not saying much she would not leave herself open to being seen as incompetent. An unintended consequence could be that the situation has been left unresolved and may recur later even worse than the first time. This problem could be resolved by adopting a different action strategy, for example to reprimand others of wasting time by quarreling and suggesting getting on with the real task at hand. Again, the conflict gets suppressed and she appears competent since the problem is due to others wasting time. Learning a new action strategy to a problem situation would constitute single-loop learning, which is related to Kolb's primary learning cycle (see Fig. 4.3). Another possible response would be to examine and change the governing values themselves. For example, the person might choose to critically examine the governing value of suppressing conflict. This may lead to discarding this value and substituting a new value such as open inquiry, with an associated action strategy such as discussing the issue openly. Changing also the governing values constitutes double-loop learning, related to the meta-reflection cycle of the Kolb's model.

Argyris gave also reasons why the double-loop learning is so much more difficult than single-loop learning [2]. You can usually make consistent models for both the mental maps people say they use to plan, implement, and review their actions, and for the maps or theories they actually do use. The problem is that usually these theories are not the same, and most people do not realize this. Further, the theories people espouse vary a lot, yet the world-views and values implied by their behaviors can usually be labeled falling into two categories, called Model I and Model II. The governing values of Model I include trying to win, suppressing negative feelings, and emphasizing rationality; the strategies include unilateral control of the environment and protection of self; operationals include covert and unillustrated attributions and evaluations ("You seem unmotivated."), discouraging inquiry ("Let's not talk about past, that's over."), treating own views as obviously correct, and saving face by leaving embarrassing facts unstated. Most of the social systems, and most people in reality follow the Model I, and it inhibits double-loop learning as it leads to defensive relationships, reduces production of valid information, and allows little public testing of ideas.

Model II, however, is espoused by most people but followed by few. The governing values include supporting valid information, free and informed choice, and internal commitment; strategies include sharing control and participation in design and implementation of action; and it is operationalized by attribution and evaluation illustrated with relatively directly observable data, surfacing conflicting views, and encouraging public testing of evaluations. The consequences of the behavior according to the Model II include minimally defensive relationships, high freedom of choice, and in-

creased likelihood of double-loop learning.

The consequences for learning should be an emphasis on double-loop learning, in which the basic assumptions behind views are confronted, hypotheses are tested publicly, and processes are disconfirmable, not self-sealing. Reflection on one's own values and behavior should lead to better insights to oneself and to reduction of the factors inhibiting double-loop learning. The end result should be increased effectiveness.

Tips for learning from experience

The theories above apply to all kinds of learning. Häkkinen gives several practical tips for learning management and leadership from experience [16].

- **Reading.** For the most part, read only when you have a specific purpose or a problem to solve. When you do read, read for tips and general rules to apply and write them down as a list of things to do and avoid.

  Learning key. Reading without a specific purpose and outcome (for example, a list of rules to try) can be a waste of time.

- **Courses.** As in reading, you should have a clear idea what it is that you want to learn. Courses that build management or leadership skills seem to require immediate application. Will you be able to apply the course teachings in your tasks or projects when you return? If you don't know what you need, or won't be able to apply the teachings, you usually shouldn't go. When you do, take notes with your learning purpose in mind, don't just take notes following the course structure. However, there are courses that are generally valuable even if they have no immediate application. Technical training, self-awareness, problem solving methods and perspective building courses are often mentioned by managers as generally helpful.

  Learning key. If you are attending a course to address a developmental need, immediate application is everything.

- **Problem relationships.** What does the person do well, can you play to his or her strengths? Is the relationship equitable? Are you sure that it is not your own behavior that is the cause for the problems with this person?

  Learning key. Everyone has problem relationships. What you can do to cope with problem relationships is a sign of your learning acumen.

- **Mistakes and hardships.** Why did you make the mistake? Accepting that circumstances usually plays a role, what part of the mistake is your problem? On the other hand, what would success look like? What would you need to be doing differently? Even if the situation just happened and was in no way your fault, what can you learn that would allow you to cope better?

  Learning key. Focus on yourself, not on all the reasons why things could have been better. Avoid thinking that subtracting something from your behavior or doing the opposite would solve the problem. Instead, ask yourself what could you add into your behavior that would remove the cause of the mistake or help you cope better.

- **Models.** What do these persons do well and how do they do it? What principles do you think they are following? Can you ask them why they are doing what they are doing? What is the difference between what they do and what you do in the same situation? What could you take directly from their behavior and adapt to yours?

  Learning key. Mentally rehearse the way you will act before going into situations that are tough for you. Think of every bad thing that could happen and prepare for it.

- **Jobs.** Specify which are the key challenges of the task (e.g., starting something up, dealing with angry customers, installing a system). What are you learning? Why in your opinion some of the things you did succeeded and some did not? With whom can you verify your learnings in order to get a different perspective? Write the feedback down so you won't forget it.

  Learning key. Analyze successes to discover what is repeatable for you.

4.3. Recognizing your own management style

Sapienza [40] claims that in addition to the relative ordering of needs for power, achievement, and relationships being a stable of part of personality, so is the leadership style. A leadership style can be based on focusing on the *task* at hand and imposing a structure on it or focusing on *people* involved in the task and working to ensure good organizational relationships. There is an association between our ordering of work-related needs and our preferred leadership style. For example, if you have a high need for achievement, you are likely to prefer task-focused style, while those with high need for affiliation are likely to prefer relationship-focused style. Though one of the two styles is the preferred one, the tendency to behave in a certain way can be modified. Each style is more effective in certain situations. For example, a task-focused style is more effective when the action, decision, or problem is explicit, even if uncertainty is high. It imposes structure on the situation and improves organizational efficiency. A relationship-focused style is more effective when the situation is equivocal and the actual problem has many possible interpretations. A candid and challenging discussion reduces the ambiguity to the point that the group can move forward. When the situation fits your preferred style things are fine, but one must exercise caution when the circumstances are different. For example, if your group is beginning research in a novel area, avoid imposing structure too soon. Instead, promote wide and challenging discussions and promote good interpersonal relationships. Conversely, once the ambiguity of the problem is reduced, you should switch to task-focused style and impose structure so the job can be completed efficiently.

4.4. Strategies for obtaining leadership

We have thus far discussed which are the new skills that a manager needs to acquire, the available means of acquiring them, and the basic leadership styles. We now turn to some strategies that a leader may employ in order to establish a position of leadership.

Denis *et al.* [11] describe several mechanisms for establishing a position of leadership for a new leader. There are two basic perspectives on how leaders become

	Learning	Persuasion	Power consolidation
Socialization	Immersion	Infiltration	Performance
Managerial control	Experimentation	Stretching	Structure

Figure 4.5. Alternative modes of learning, persuasion, and power consolidation.

integrated with their organizations. The *managerial control* perspective conceives the integration as a process of "taking charge", and emphasizes the capacity of leaders to dominate their organizations. The alternative perspective of *socialization* describes the means by which newcomers are initiated into the organization's culture and learn how to behave within their assigned roles. As usual, real situations are seldom in one end of a continuum — in practice, the leader both shapes and is shaped by the organization. These perspectives modify the three fundamental processes associated with leader integration (*learning*, *persuasion*, and *power consolidation*) producing six mechanisms (illustrated in Fig. 4.5) that over time allow a leader to widen his or her room for maneuvers: *immersion* and *experimentation*, *infiltration* and *stretching*, *performance* and *structure*. Denis *et al.* explored these processes through a real example, a CEO coming from outside of the organization to lead a major hospital.

Each of the basic processes has then a collaborative and affirmative form, associated with the socialization and managerial control orientations towards integration. Collaborative learning or immersion involves listening and observing before acting and implies acceptance of how things are, while affirmative learning or experimentation includes testing the limits of what is possible. Experimentation creates contrasts and surprises that are useful for developing a rich understanding of the organization. However, it is risky since if too many of the trials lead to an error, the result may be damage to the leader's credibility. Collaborative persuasion involves infiltrating ideas by framing them in ways that fit others' interests. Though people are likely to accept some new ideas this way, only limited changes in perspectives can be expected. Affirmative persuasion involves stretching the acceptability of ideas by proposing them in extreme form and then negotiating backwards. An initial conflict is almost guaranteed, yet more significant changes can be introduced. Collaborative power consolidation or performance implies development of informal power by performing according to expectations and gathering political capital. Affirmative power consolidation implies developing formal power by using structural levers such as hiring, firing, and the redefinition of control systems. In general, the collaborative forms of the integration mechanisms are likely to gain more acceptance but smaller changes than the affirmative forms. This problem has been called the leadership dilemma [8]. Leadership is most effective when it is legitimated by the approval of the led. Yet, forceful leadership action is likely to be often incompatible with social approval. One way to resolve this problem is through timing, where the gathering of political goodwill happens first and the forceful actions come later, perhaps also in small doses.

5. Summary and conclusion

The decision, whether a researcher should become a manager, is not to be taken too lightly. Though one might think first that management is just another technical skill that a bright person should be able to pick up, it is more than that. Being a good manager, taking care of the people that work for you, and coordinating activities for the benefit of the company, require not only a different set of skills than what is expected from a researcher, but also a different set of attitudes and values. That is, one may be required to adopt a new self-image.

There are several reasons why a technical specialist should remain one, even after he or she has moved into management, but usually trying to do two jobs at the same time mean that both jobs suffer. Perhaps companies should provide more support for that, but usually they don't.

There are many motivations why a researcher may desire a managerial position. If one is comfortable with dealing with people and their problems, and generally enjoys organizing things, a move into management is probably the right choice, both from the viewpoint of the company and the individual. Even if the real motivation is to obtain a higher status, more power, or bigger salary, but the person is intelligent, good learner, and motivated to modify his values and attitudes to match the new requirements, the result is likely to be a good one for everyone involved. However, if it turns out that the old values and self-image remain strong, the person is likely to be a good manager.

Being a manager requires mostly tacit knowledge of how to plan and organize things and lead and deal with people. Learning facts from books and courses can be beneficial, but the best way to learn is through experience and active reflection. This reflection can be facilitated by discussions with a mentor, other managers in the same management training, and colleagues.

When one wants to learn practical management one needs to be first and foremost a human being in the widest sense of the word, and only secondarily a professional manager [36]

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