

Project Management and Education for the 21st Century

R. Max Wideman, P.Eng
FCSCCE, FEIC, FICE, Fellow PMI
AEW Services, BC

This paper was presented to a conference on "The Project Management Information Society", May 14-16, 1995, in Ottawa, Ontario, Canada. It was given at a time when the idea of a Canadian project management institute was being promoted. This idea now seems to be moribund.

In almost all areas of management application, project management, or rather "Managing by Projects", is considered to be the "new breed of management" for the 1990s and beyond. If this is true, and Canada's competitive edge in the global market place is to be maintained, then a proper understanding of project management in all its ramifications must become much more widely spread. To achieve that requires a significant educational effort and this effort, to be both effective and efficient, will require a "new breed of education". But where will the drive for a better understanding of this relatively new discipline come from?

This drive is already with us in the form of a "new breed of projects" in our real-time information society. The hi-tech world of computing provides a prime example for illustration.

A Client/Server Project Success Story¹

In 1992, Project Manager Rob McMurtry, from IBM's local office, initiated IBM's involvement in the critical \$5 million Client/Server component of the \$160 million '94 Commonwealth Games project. The project, held in Victoria, B.C. for the Victoria Commonwealth Games Society, called for the development and delivery of a system designed to provide all Games information in real-time to a wide audience. It also included the head office administration systems which were used in planning this sporting event.

The team that Rob managed consisted of his Victoria-based IBM group, a major games system developer (MSL of Madrid, Spain) and several local contractors who provided valuable development and networking skills. This team was responsible for the integration of technologies that generated "results" for the TV and Radio Rights Holders, the written press, venue spectators, sporting officials, athletes and coaches. It also involved working closely with Seiko's timing and scoring technology and the television broadcasters' video graphics technology.

All the classic constraints were present in the project. The time frame was a fixed opening date of August 18, 1994. The systems must be up and running by that date — and no slippage was possible! Since IBM were also supporting the Games by part-sponsorship of this effort, managing the tight budget was a particularly sensitive issue.

Deliverables included the latest in personal computers, a "LAN"scape consisting of 24 sub-LANs connected to a backbone LAN, as shown in Figure 1, desktop OS/2 WARP software, productivity software, education and support in their use, and application and network support during the games. Intermediate deliverables included network design and implementation, games enabling system

development, integration of the "Results Systems", skills transfer to a group of staff and volunteers, and a solid set of contingency plans.

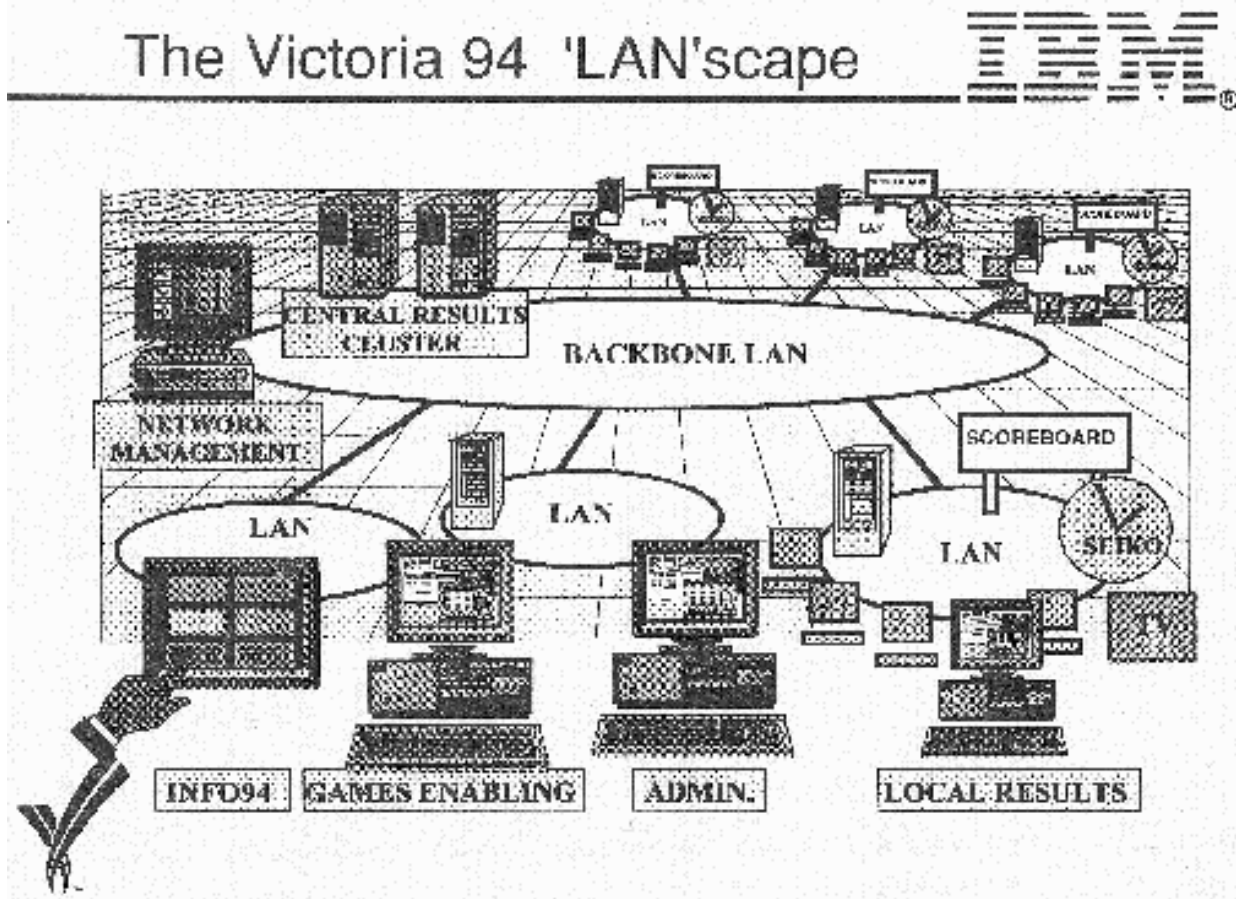


Figure 1 – The '94 Games LANscape in Victoria, BC, Canada,

As people who watched the Games already know, it consisted of eleven categories taking place at ten venues. There would be some 5,000 athletes, 5,900 support staff, 8,700 volunteers, 3,000 press and 4,500 security, for a total of over 27,000 users of the system! Over a quarter of a million tickets would be sold and a world-wide audience of perhaps 400 million. The Games would also be acclaimed as very successful on all counts.

The stakes (success criteria) of Rob's project were high. It would be a "Showcase" project for IBM. Proven, reliable, sports solutions were required with total coverage through computer integration located at distributed sites. High system reliability was essential with a high level of trust and "partnership" between providers and users. Of course, Rob established all the usual tools of project control like a baseline charter, a work breakdown structure, change controls, quality assurance and testing, Timeline™ planning, asset tracking using Lotus Notes™, financial tracking from both a cost view and gross profit view, regular status reports and project reviews, user system sign-offs, and so on.

Yet to hear Rob tell it, none of these were the areas of most concern. It was the diversity of the people involved. Rob's clients and stakeholders consisted of the Victoria Games Society, the athletes and their coaches from many parts of the world, the judges and officials, the supporting volunteers including co-

op students, and other constituents such as government officials having jurisdiction, other sponsors, families of the athletes and, of course, the audience. These stakeholders had different levels of expectations, different levels of understanding and different levels of discipline.

Reflecting back, Rob says that he felt they made the right choice to adopt a small core team in a flat organization structure. They opted for a high level of client involvement (buy-in) and delegated authority and responsibility through "forced" empowerment to everyone regardless of their lack of previous experience. But perhaps the stakeholders that were most underestimated were the TV brigade. Rob says that their actions and way of preparing for these kinds of events are heavily influenced by their "artistic" wants and needs.

In their business, a good last minute idea is often or usually implemented. What he found was a dichotomy between his team's need to stabilize, freeze changes, test thoroughly... and then deliver. As an observer of how they prepared and delivered the broadcast of the Games he was impressed. It was just that they were not able to cope well with the planning approach necessary in the IT area, and recognize the effects on others of their last minute changes.

With this description, it does not take much imagination to see that the required primary project management skills were not technical or mechanistic — but people and communication skills.

The Need for Leadership

The type of project just described clearly needs leadership, but what is leadership?

Through the efforts of the Project Management Institute ("PMI"), an understanding of the importance of "people" to the success of a project has developed rapidly over the last several years. The major thrusts are perhaps best portrayed graphically as shown in Figure 2.²



Figure 2 – Major project leadership skills

With these attributes in mind, the following definition is a simple, yet comprehensive distillation of leadership thought in the project context.

Project leadership is an ability to get things done well through others.

It requires:

- A vision of the destination
- A compelling reason to get there
- A realistic timetable, and
- A capacity to attract a willing team

But in PMI we talk about project managers. So, is there a difference between a project leader and a project manager? PMI defines a project manager as one who is responsible for project management..., and now defines project management as the application of knowledge, tools and techniques to project activities...³. However, these definitions only focus on the administrative aspects of project work. Many well-known authors have written about managers and, especially recently, about leadership. Generally, these authors see a distinction according to the primary focus of the leader or manager.

Table 1^{4,5,6} shows the respective positions of leaders and managers on a number of issues. It is a truism that leaders focus on doing "the right thing" while managers focus on doing "the thing right".

Managers focus on	Leaders focus on
<ul style="list-style-type: none"> • Goals and objectives • Telling how and when • Shorter range • Organization and structure • Autocracy • Restraining • Maintaining • Conforming • Imitating • Administrating • Controlling • Procedures • Consistency • Risk-avoidance • Bottom line 	<ul style="list-style-type: none"> • Vision • Selling what and why • Longer range • People • Democracy • Enabling • Developing • Challenging • Originating • Innovating • Directing • Policy • Flexibility • Risk-opportunity • Top line
<p>Good managers do <i>things right</i></p>	<p>Good leaders do <i>right things</i></p>

Sources: Adapted from Warren Bennis *On Becoming a Leader*, Addison Wesley, 1989; J. W. McLean & William Weitzel *Leadership, Magic or Method?*, AMACOM, 1991; Stephen R. Covey *Principle-Centered Leadership*, Summit Books, 1991.

Table 1 – Differences in style

Collectively, project leadership and project "managership" may be referred to as project "stewardship". To be a steward is to hold something in trust for another. Thus, project stewardship may be defined as a willingness to be accountable for the well-being of the project organization while placing service towards the goals of the project above self-interest. It entails holding accountability for your people without exacting harsh compliance from them. In the planning phases, "managership", as described, has its limitations. Leadership overcomes these limitations. In the producing phases, leadership per se also has its limitations, and good "managership" is required.

Leadership and the Project Life Cycle

It is clear that leadership is important to the success of a project because leadership is essentially about motivating people. It is also clear that what may be characterized as "managership" is equally important because this is about getting things done. Can the two be reconciled? For this it is necessary to turn to a fundamental principle underpinning the concept of project management.

Project management is a structured but flexible process for producing a new end result. Its success depends on the application of a two step sequence: First plan - then produce. This is the genesis of every successful project life cycle.

For example, in the "planning" phases of a project, the project leader conducts the project team and other main stakeholders through formal and informal decision making in order to achieve agreed goals and objectives. This process involves a high degree of interaction and formulation of organizational strategies. It takes time and is challenging. The development of the resulting technical requirements may require a number of iterations and re-runs. This is especially true at the outset, in order to flush out the "customer's needs". Therefore, "visioning", "intelligence gathering" and developing "a compelling reason" and "appropriate strategies", are the all-important issues. These issues also form the essential basis for effective team development.

In this, project management is near-unique. For while a CEO or other enterprise leader may develop his "team" once (or so) in his/her tenure, the project leader must be conscious of the "Project Team Development Cycle" for *every* project and *throughout* the project life cycle. Thus, planning is about optimizing the effectiveness of the project and its results, i.e. "doing the right things".

On the other hand, the real work of task execution gets done in the "producing" phases. In these phases, the paramount requirement is an ability to satisfy the customer(s) by conducting the efforts of the project team towards the required product(s) under typical project constraints. This is achieved by consistently "getting the message out", which also provides the essential basis for project control. Thus, producing, or management of production, is about optimizing the project process, i.e. "doing the things right".

To get a project off to a good start, the project manager must be a leader, but this style of leadership does need to change as the project progresses through its life cycle. Indeed, there comes a point in time when "managership" is more important than "leadership". It will be observed that "information" (intelligence gathering) in the planning phases, and "communications" (getting the message out) in the producing phases, i.e. intercommunication, is an essential skill for both the project leader and the project manager. Table 2 shows this progression from leader to manager in greater detail.

Phase	Major Attributes/Emphasis	Leadership Style/Blend
Feasibility Study (Pre-formulation)	<ul style="list-style-type: none"> • Sense of vision • "Big Picture" (conceptual) • Analysis 	<ul style="list-style-type: none"> • Visionary • Creates future • Empowerment • Expansive
Conceptual (Formulation)	<ul style="list-style-type: none"> • Listening • Analysis • Alignment 	<ul style="list-style-type: none"> • Analytical • Listener • Change master • Convergence
Development	<ul style="list-style-type: none"> • Participative/Acceptance and commitment • Cooperative 	<ul style="list-style-type: none"> • Team builder • Power and influence • Integrator
Execution	<ul style="list-style-type: none"> • Re-alignment 	<ul style="list-style-type: none"> • Decision maker • Balances work and fun • Trustworthiness • Team and synergy
Finishing	<ul style="list-style-type: none"> • Transfer of product and information 	<ul style="list-style-type: none"> • Administrator • Closure

Table 2 – Leadership and the project life cycle

In Figure 3 we shows how the progression in Table 2 relates to the typical major tasks of the project life cycle, and corresponding organizational strategies.

Leadership and Team Building

An effective project team leader is a "social architect". One who understands the interaction of organizational and behavioral variables, can foster a climate of active participation and can minimize dysfunctional conflict. To be effective, the team leader must identify major issues associated with three dimensions. The first dimension is the project organization structure, including organizational development, and senior management involvement to ensure visibility, resource availability and overall support for the project throughout its life cycle. The second is team related with emphasis on behavioral aspects such as team structure, trust and respect, or conversely, barriers to team development. The third is project task and resource related such as goals and objectives, planning and scope management, scheduling and cost control. These are all accomplished through effective communication.

But what of the other essential ingredient, the team, the followers? Ideally, the more the team can be motivated and empowered to "take the bull by the horns", the more productive they become and the less direction and control is required. This has been called empowered team work, or Self Directed Work Teams (SDWTs). In the project context, however, they are probably more appropriately termed Self Managed Work Teams (SMWTs).

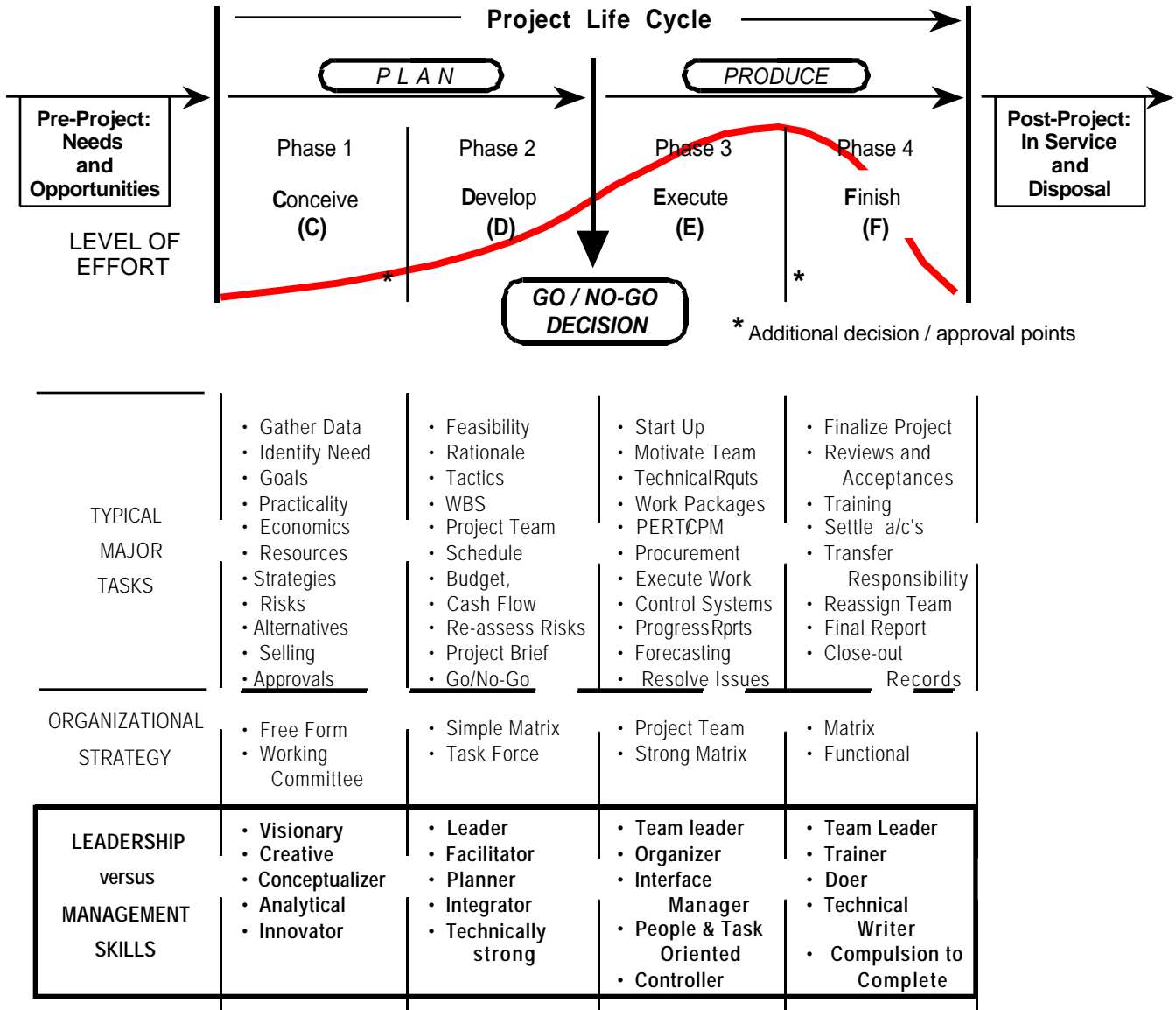


Figure 3 – The evolution of tasks and people through the project life cycle

The Necessary Skills

What are the project management skills required? Referring back to our hi-tech information distribution example, these skills are not, as we might expect, an in-depth knowledge of systems, computer technology or software. True, a sufficient knowledge of these subjects was certainly required, but an unbalanced knowledge of the project in this respect could actually be a barrier to successful project performance. Rather, the skills sets, that is, for the members of the project managing team, relate to the "people" dimension. For example, the project manager or team leader, whatever he or she may be called, should have an ability to:

- Handle stress and take responsibility for the success or failure of the project.
- Lead through formal and informal authority, especially in a corporate matrix environment, winning the support of the project’s stakeholders for its goals.

- Organize and coordinate all contributors to the project, especially specialists with superior knowledge, or stakeholders with vested interests.
- Foster positive problem solving and negotiation without compromising project objectives.
- Understand and deal with conflicts that inevitably arise, and achieve harmony between diverging or opposing technical views, and arrive at timely closure.
- Assess project status and progress and make mature judgments that focus on the success of the project.

What does all this add up to? Focused "communication" skills and "people" skills. For many, particularly those who are more comfortable with science and engineering or, for that matter, computer hardware and software, this is "touchy-feely" stuff! They are far more comfortable with the mechanistic aspects of project management, namely the tools and techniques of time and cost control.

But this is the new reality. Projects are done by people and they must contribute effectively and efficiently. Unless they are motivated and encouraged to do so, and stay focused on the project's objectives, no amount of "tools and techniques" will save a poor project from getting worse.

Knowledge Transfer

But how are these "communication" and "people" skills to be transferred to each new generation of managers?

Consider, briefly, the development of a new science or discipline. The following traditional and progressive stages can generally be identified. First, Observations: collection of anecdotes (empirical). Then, Thesis: generating hypothesis and theorizing based on observations. Then, Thesis Testing: seeing if what a thesis predicts is true (i.e., gives support or contradiction); followed by Antithesis: generating competing theories. Next, a new position: a new theory that explains all of the foregoing and, finally, Mature Science: a well established discipline.

Thus, the mature science has progressed through stages to ever increasing detail by a process of "reductionism". That is to say, like a work breakdown structure, you can take anything and reduce it down to smaller and smaller pieces to facilitate increasingly detailed understanding. This approach is very successful in physics, for example, and many other sciences have follow this model. Indeed, they have done so very successfully.

Consequently, many of our academic institutions are arranged around this model and are characterized by science specializations. This is also reflected in their institutional journal publications and the content of each closely reflects the degree of maturity of each specialization. This may be very appropriate for those sub-disciplines of project management that are comparatively well established, such as quality, time and cost management, and which have recognized principles of planning, measuring and control. But, as we have seen, project management is not just about "getting things done within time and cost constraints". It is also about the process or "manner of getting things done", if "customer satisfaction" is to be achieved and the project acclaimed as successful.

This is where people relationships come into play, involving psychological influences such as power, authority and responsibility, reliability and accountability, cultural differences, public relations, and so on. These influences are exercised through communication in its broadest sense. Clearly, these "communication" and "people" skills are much more than just knowledge. They also take practice which comes from experience. And that is why we need a new approach to education.

If we are going to manage by projects, then why not "Educate by Projects"? "Projects" are a familiar part of most school classroom activities. Unfortunately, the concomitant project management disciplines, as we understand them in the Project Management Institute, are rarely taught alongside, if indeed, they are understood at all. Still, there is hope.

Learning establishments are now appearing that use projects as the sole vehicle for real education. . . one that becomes a voyage of discovery, of excitement and adventure that invokes the whole gamut of skills from motivation, through negotiation, to delegation, to coordination and successful conclusion

Learning establishments are now appearing that use projects as the sole vehicle for enlightenment. In this learning environment, the project is not just an arduous homework assignment, but a voyage of discovery, of excitement and adventure that invokes the whole gamut of skills from motivation, through negotiation, to delegation, to coordination and successful conclusion. If education is learning how to learn, how to take part and communicate (rather than absorption of subjectively selected data), then this is real education for it includes the basic skills required to survive in the real world. In short, education on a much broader bandwidth — and the earlier it starts in the school curriculum the better.

A Role for PMI•Canada: Two Master Strokes

Fundamental Differentiation

Perhaps the first master stroke for PMI•Canada is to recognize that there are two very fundamentally different types of project. The distinguishing feature results in a very different approach to the project management process itself and, I suggest, a very different approach to project management education. This broad division transcends the purely technical aspects of a project, its industry category, or an individual's job description.

The issue is whether the product of the project is physical in nature (such as a new facility, or tangible product) or intellectual (such as in new information processing systems, research projects, or customer service) These are as distinct as hardware versus software.

The former group are much more amenable to logical planning, scheduling and estimating, the traditional techniques of project management. This is not true of intellectual projects. Intellectual projects are much less structured, too little is known, network logic is fuzzy and, of necessity, they must be managed from phase to phase. Each succeeding phase cannot be planned until the results of the prior phase are at hand. Interestingly, for this type of project, Robert Waterman, the widely respected co-author of "In Search of Excellence", has coined the phrase "Adhocracy"⁷.

Adhocracy is an environment in which it is necessary to lend a semblance of structure to the apparently unknown. It is still necessary to break the project up into bite-sized chunks (Work Breakdown Structure) but the chunks are based on phase sequence rather than on deliverables. Only the first in the sequence is planned in any detail. Subsequent phases are planned only in the very loosest sense. In fact, more detailed planning would only get in the way of progressing to the most satisfactory project conclusion.

In this environment and until the final phase, the "people" aspect, and communication between them during the course of the project, is paramount over focus on producing the final product.

Building a New Platform

The second master stroke for PMI•Canada is to recognize that it is unrealistic to expect a single generic qualification to represent any serious degree of competence in managing all types of project. To recognize, in fact, that the present Project Management Professional (PMP) designation and its qualification process is, at best, a universal entry level qualification.

Interestingly, the European organization, INTERNET, have devised their qualification based on a new concept of competency standards. This appears to take the opposite tack of peer review rather than our US-based multiple choice examination. Most likely what is needed is some compromise between these two extremes. However, what is first needed is a more open Project Management Body of Knowledge (PMBOK) structure that recognizes all the factors discussed earlier.

Here, I see excellent opportunities for PMI•Canada to chart a new course in setting criteria for the contents of a Canadian PMBOK as well as setting standards for qualification. Not reinventing the wheel, but building on the work of others towards a new, more advanced project management platform.

Conclusions

A better and more far reaching understanding of project management as a step towards "managing by projects" is required if Canada is to remain competitive. This needs a new breed of education and the drive for this is already apparent from a new breed of projects. These projects are not only technically advanced, but need a primary focus on "people" skills and "communication" skills.

Much has been written about what leaders do and what managers do, but in running a project the real issues revolve around project "stewardship". That is, what style of leader/manager is appropriate in the context of the different phases of the project life cycle. Either way, the primary focus is still on "people" and "communication" skills.

It has been said that a changing world has always been with us. The difference is that this change is no longer incremental, but exponential. Therefore, these essential project management skills must be more effectively transferred.

Unfortunately, our current educational system does not appear to be up to the task. For the most part, it is highly functionalized by discipline. If we must Manage by Projects, we must also Educate by Projects.

This approach provides students with both the knowledge and experience foundation for motivation and capability in the business market place.

PMI•Canada can play a significant role in identifying the required learning and establishing a "new platform" standard. Not by reinventing the wheel, but by building on the work already done. Not clinging to our North American perspective, but by taking advantage of other cultural approaches. If we could achieve this, PMI•Canada would not only be serving our national constituency but providing a truly international role.

Perhaps we should start by asserting much more vigorously that project management is both an art as well as a science. That it involves both people and things, rigor and flexibility, and needs project leaders/managers who can recognize when to apply each to the best advantage of the overall process.

To achieve this it will be necessary for the next generation to have instruction and experience in both realms, and we shall need educational establishments which clearly and comfortably encompass both. If we could accomplish that, maybe we should see more motivated team work and more consistently successful projects. With more consistently successful projects surely we would become more competitive internationally? After all, isn't that the kind of "project success" that is the ultimate national objective?

Perhaps the outstanding issues are these. How do we achieve a paradigm shift in the thinking of our educational establishments on the one hand, and their acceptance of project management on the other?

¹ McMurtry, R.A., The Commonwealth Games - A Client/Server Success Story, a presentation to the inaugural meeting of the PMI Information Systems Specific Interest Group, Vancouver, B.C., January 1995.

² Adapted from Hellreigel, D., Slocum, J. W., Jr. & Woodman, R. W., Organizational Behaviour, Sixth Edition, West Publishing company, 1992, p386.

³ PMBOK Glossary, Project Management Institute, 1987.

⁴ Bennis, W., On Becoming a Leader, Addison Wesley, 1989.

⁵ McLean, J. W., & Weitzel, W., Leadership, Magic, Myth or Method?, AMACOM, 1991.

⁶ Covey, S. R., Principle-Centered Leadership, Summit Books, 1991.

⁷ Waterman R H Adhocracy, The Power to Change, W W Norton & Co., NY, 1992, p16 & 59.