

First Principles of Project Management – Part 2

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First Principles of Project Management

Based on the criteria described in Part 1 of this paper, the following *First Principles of Project Management* have been articulated. These principles build extensively on the work of John Bing.¹ All the principles presume certain assumptions about the cultural ambience in which the project takes place, which leads to our first principle.

1. *The Cultural Environment Principle*

Management must provide an informed and supportive cultural environment that is suited to project-type work to ensure that the project delivery team are able to work to the limits of their capacity.

The ability of a project delivery team to produce results both effectively and efficiently is highly dependent upon the *cultural environment*. This *cultural environment*² encompasses both internal and external project relations and values. Internally, the management style of the team leader must be suited to the type of project and its phase in the project life span. Externally, the management of the organization in which the project takes place must be supportive, the project sufficiently resourced, and the environment must be free of obstacles.

The resulting ambience is one that encourages and sustains teamwork and honesty and demonstrates that.³

1. Everyone is clear on the project's ultimate goals and is working towards those same goals, whatever those might be.
2. Everyone is clear and agrees on who the *customer* is
3. Appropriate levels of skill or experience are available as needed, and
4. Everyone wants the project to be a *success*.

2. *The Project System Principle*

A well-managed project is a complex system in which the management process proceeds through an orderly timeframe that relies heavily on doing the right thing in the right way and at the right time.

A *well-managed project* is one that is optimized for effectiveness in its planning phases but emphasizes efficiency in its implementation phases. Implementation includes the transfer of the product to the care, custody and control of the customer.⁴ In reality, the *complex system* referred to consists of an intricate collection of interacting balancing and non-balancing mental feedback processes, each with their own cause, effect and side effect patterns. This complicated, often random, arrangement is enough to defeat many minds. In other words, "an inability to see the forest for the trees" is a problem for many individuals. But for the project manager, "an ability to see the forest *as well as* the trees" is an imperative for running a successful project.

Thus, project management is dominated by high levels of decision-making activities that absorb a considerable amount of effort since decisions on one part of the system can have significant repercussions on other parts of the system. This is why establishing and maintaining a robust and up-to-

date *Business Case* is an essential prerequisite for "doing the right thing in the right way and at the right time". We introduced the idea of a Business Case earlier in Part 1 of this paper under the heading *Project Life Span*.

3. The Strategy Principle

A strategy encompassing first planning then doing, in a focused set of sequential and progressive phases, must be in place.

The genesis of the project life span, in its most basic form, is to be found in the very term "project management" itself. A project has, by definition, a start and a finish with some activity in the middle. The essence of management is to "plan before doing". Hence the most fundamental project life span process consists of four sequential periods of *Start, Plan, Do* and *Finish*. Of course these four periods can be expanded into separate phases each with their own interim deliverables and *Executive Control Points* (or *Gates*) that can also be viewed as *Emergency Exit Ramps*. These can be designed to suit the control requirements of every type of project in every area of project management application and are particularly important from the perspective of project portfolio management. Indeed, this sequence is, in effect, equally applicable at every level and branch of the project structure as suggested by Figure 2 in Part 1 of this paper. It is also just as relevant where a *fast-track* strategy or an iterative approach is adopted.

The importance of this life span process and its influence on the management of the project cannot be over emphasized. This relatively short-term life-to-death environment, and the consequences that flow, is probably the only thing that uniquely distinguishes projects from non-projects.⁵

4. The Success Principle

The measures of project success, in terms of both process and product, must be defined at the beginning of the project as a basis for project management decision-making and post-project evaluation.

It is axiomatic that the goal of project management is to deliver a successful product, otherwise the incurring of this management overhead is a valueless exercise. First and foremost, the project's proponents must define project success in terms of the acceptability of the project's deliverables, e.g. scope, quality, relevance to client needs, effectiveness, profitability, general benefits to the organization and so on.

Secondly, success should be defined in terms of the project's internal processes, e.g. time, cost, execution efficiency, etc. The timing of the measurement of success itself may also need specifying. Moreover, the proponents must be in general agreement on the definition of these success criteria, for without agreement, it will not be possible to evaluate the success of the project overall.

It goes without saying that these measures of project success should be verified and reinforced throughout the project life span. As a corollary, if the success measures are no longer in alignment with the organization's business goals at any point, it should be perfectly acceptable to abort the project or at least halt it pending re-evaluation. (See also Discussion: Success Principle, below.)

5. The Commitment Principle

An equitable commitment between the provider of resources and the project delivery team must exist before a viable project exists.

The provider of resources (money, and/or goods and services, and general direction) is typically called the project's *owner* or *sponsor*. The project delivery team is responsible for developing appropriate tactics, plans and controls for applying the necessary skills and work to convert those resources into the required deliverables or product. An *equitable commitment* means that both parties are sufficiently knowledgeable of the undertaking, i.e. the overall objectives, the technology, the processes involved and their associated risks, and that both parties willingly undertake the challenge.

The attributes of both parties should encompass relevant skills, including those of the technology involved, experience, dedication, commitment, tenacity and authority to ensure the project's success. The owner of the project must understand that even with appropriate management controls in place, there must be a sharing of the risks involved. (See also Discussion: Commitment Principle below.)

6. The Management Principle

Policies and procedures that are effective and efficient must be in place for the proper conduct and control of the project commitment.

This principle is an extension of the strategy principle. The Strategy Principle determines *what* is going to be done and *when*. The Management Principle establishes *how* it is going to be done and *by whom*. The attributes of this management control encompass the project's assumptions, its justification and a reference baseline in each of the core variables as a basis for progress measurement, comparison and course adjustment. The attributes of good policies and procedures encompass clear roles and responsibilities, delegation of authority, and processes for maintaining quality, time and cost, etc. as well as managing changes in the product scope and/or scope of work.

7. The Single-Point Responsibility Principle

A single channel of communication must exist between the project sponsor and the project manager (or otherwise the team leader) for all decisions affecting the product scope, quality, delivery date or total cost.

This principle is an extension of the management principle and is necessary for effective and efficient administration of the project commitment. For example, the owner of the eventual product, if represented by more than one person, must nevertheless speak with one voice through a primary representative with access to the sponsor's resources. Similarly, the project's delivery team must always have a primary representative.

However, this only applies to the decisions affecting the product scope and quality and hence the project's overall cost and delivery. In all other respects, free and transparent communication is indispensable for the coordination of a complex set of project activities. Therefore, this principle must not in any way inhibit the proper exchange of information through the network of project communication channels that is required to integrate all aspects of the project.

8. The Tetrad Trade-off Principle

The core variables of the project management process, namely: product scope, quality grade, time-to-produce and total cost-at-completion must all be mutually consistent and attainable.

This principle is an extension of both the Commitment Principle and the Success Principle. The core variables of product scope, quality grade, time-to-produce and total cost-at-completion collectively, often loosely referred to as scope, quality, time and cost, respectively, are measures of internal project management efficiency. If these variables prove not to be mutually consistent and attainable, the commitment is neither equitable nor are Key Success Indicators likely to be met. The interrelationships of these four separate variables are somewhat similar to a four-sided frame with flexible joints. One side can be secured and another moved, but not without affecting the remaining two.

Discussion

First Principles Generally

Issue #1: Do we really need "First Principles of Project Management"?

Most people seem to have managed very well without them, that is, until the trouble starts. Most projects take place in a corporate environment but the approach to corporate management and to project management are very different. Indeed, the reality is that many managements place obstacles in the way of project progress, perhaps unwittingly because of management's functional heritage.

Marie Scotto has provided a compelling list of differences.⁶ Perhaps the most significant is that "The business community believes in understaffing which it can prove is generally good business most of the time." In contrast, projects are especially risky by their nature and need a margin of surplus if for no other reason than to take care of contingencies. For a project to be under-resourced is a recipe for failure. Consequently, a set of credible *First Principles* is not only needed to provide a robust underpinning for project management learning, but also for making a convincing case to corporate management for providing the necessary support.

Issue #2: Management of the Project versus the Technology

Can we really separate project management from technology management? This is an issue for most people who suggest that it cannot be done, even though they may agree that there are differences. The reason is that in practice, decisions made in the technology management domain and decisions made in the business domain shape decisions made in the project management domain due to contextual dependencies. Similarly, project management decisions also shape decisions in the other two domains.

But consider the analogy of the human body. The human body cannot function without, say, the brain or the heart. Conversely, the brain or heart have no use without the rest of the body that they serve. All bodily components must be fully integrated for a properly functional unit. Nevertheless, that does not stop us from studying the brain and heart organs in great detail as distinct functions and, in particular, comparing them across a variety of types of people!

Issue #3: What should be included as a First Principle and what excluded?

The key criterion is taken to be whether or not the principle is universally fundamental to project success as defined. For example, without some form of commitment there can be no project and hence no

possibility of success. On the other hand, there are many major tools and techniques the application of which might be considered as essential to success.

For example, a formal *work breakdown structure*, *schedule network*, *earned value analysis*, *change control process* and so on might be included. However, projects in many application areas are run successfully without applying these tools. So, while they may be considered good practice, they are not necessarily essential. Each such tool undoubtedly relies on its own set of principles that may be considered as secondary to the *First Principles*.

Success Principle:

Issue #4: It has been suggested that the issue of success is so obvious as to be unworthy of a first principle.

However obvious and sensible the setting of project success criteria at the beginning of a project may seem, regrettably, it is not always a common practice. Without defining these success criteria, how can agreement be reached on a particular project's priorities, trade-offs, the significance of changes, and the overall effectiveness and efficiency of the project's management? For this reason, a lot of conclusions drawn from surveys and similar experiential material could be very questionable.

Contrary to conventional wisdom, there have been many projects that have been "On time and within budget" but the product has not been successful, and similarly many that have not been "On time and within budget" yet by other measures the product has been very successful. Motorola's Iridium is a good example of the former while the movie *Titanic* is a good example of the latter.

We believe that project success is much more than just "Doing what you set out to do". It is also about whether what you are doing is in fact the right thing to do. We believe that the ultimate goal of a project, and therefore its measure of *success*, should be the extent to which the product produces the intended benefits and hence the satisfaction with the product on the part of the customer. As noted earlier, the assumption is that the *customer* is clearly identified.

As Gerald Neal points out, the reality of life on many projects is that everyone on or associated with it does not have the same aspirations and goals. As a result "the project gets pulled in many different directions . . . [by] . . . status, pride, power, greed . . .".⁷ In most cases, this may be a little exaggerated, but even at the most elementary level, the project owner will be interested in benefiting from the product while the workers on the project will be interested in benefiting from the process. This makes the definition of a project's success even more important – to provide a reference baseline for the correction of divergent progress.

So, *success* for a project and how it will be measured after completion does need to be defined at the beginning of the project. The most important reason is to provide an on-going basis for management decision-making during the course of the project even though the understanding of that success may mature during its course. Hence the need to continue ensuring alignment with the project's Business Case, and the project's Business Case with corporate objectives.

Commitment Principle:

Issue #5: It has been suggested that there should be a "Business Principle"

That is, a principle that states that the project must be in alignment with the sponsoring organization's goals. This is a valid comment, but this connection is in fact embedded in the Project System Principle requiring that a robust and up-to-date *Business Case* is established and maintained to drive appropriate decision making throughout the project life span. It is corporate management's responsibility to determine the relevance and soundness of the *Business Case* before giving project approval to proceed to the next phase.

Issue #6: Similar to Issue #5, it has been suggested that there should be a separate "Technical Principle"

The issue here is that the project leader and team members must be knowledgeable in the technology of the product. This is certainly true, but this is covered by the Commitment Principle in that an *Equitable Commitment* is not possible without a sufficient understanding of the project, its technology, and especially the major risks involved.

Issue #7: It must be recognized that every project "evolves" through its life span and the commitment and tradeoffs will similarly evolve.

On most projects the players will also change, as it moves through its life span, simply to meet the changing level of effort and different skills required in each phase. Nevertheless, an *equitable commitment* can and should exist for every phase of the project if the project is to remain viable.

Once again, in the real world, many projects are not set up this way. Resources are short changed or reprioritized and unattainable deadlines are set, often for the reasons described by Marie Scotto (see Issue #1 above.)⁸ Thus, the absence of consistent definitions of success and commitments simply means that the probability of success is greatly diminished – if not impossible.

Tetrad Trade-off Principle:

Issue #8: Although the term "Tetrad Trade-off" has been in the literature for some years,⁹ objection has been raised because the term is unfamiliar.

Perhaps this is the very value of the term – to emphasize that there are four separate but interactive variables (scope, quality, time and cost) rather than just three as in the old and obsolete view of *Triple Constraint* (time, cost and performance.) Thus, quality, the most enduring variable of the four when it comes to project success, is given new prominence. It should be stressed here again that quality means *Quality Grade*, i.e. the measure of level or class (utility to world-class) as distinct from *Quality Conformance*, i.e. "conformance to specified requirements".

Interestingly, the "dimensions of the Tetrad" are affected by the skills and experience, i.e. the expertise and hence efficiency, of the team doing the work. The more "expertise" the team has, the higher their situational awareness and the faster their "learn-rate". In addition they can typically perform tasks faster because of their prior learning. These capabilities allow teams of experts to achieve more with less. This ability expands what can be achieved and hence affects the size and shape of the Tetrad. This point is often lost on managers who see resources as fully interchangeable and homogeneous.

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¹ Bing, John, A. Principles of Project Management, PMNetwork, PMI, January 1994, p40

² For definitions of 'culture' and 'environment' in the project context, refer to the Wideman Comparative Glossary of Common Project Management Terms: <http://www.maxwideman.com/pmglossary/index.htm>

³ Contributed by Gerald Neal by Email dated 9/23/99.

⁴ See the definition in the Wideman Comparative Glossary of Project Management Terms:
<http://www.maxwideman.com/pmglossary/index.htm>

⁵ Section 60 Life Cycle Design and Management, CRMP Guide to the Project Management Body of Knowledge, Centre for Research in the Management of Projects, University of Manchester, 1999.

⁶ Scotto, Marie, Project Resource Planning, in Project Management Handbook, Jossey-Bass, 1998, Chapter 13.

⁷ Contributed by Gerald Neal by Email dated 9/23/99.

⁸ Ibid.

⁹ See *A Framework for Project and Program Management*, Editor R. Max Wideman, Project Management Institute, PA, 1991, pV-4.