Fundamentals Of Managing Multiple Projects

(Conference Session T498)

Presented By

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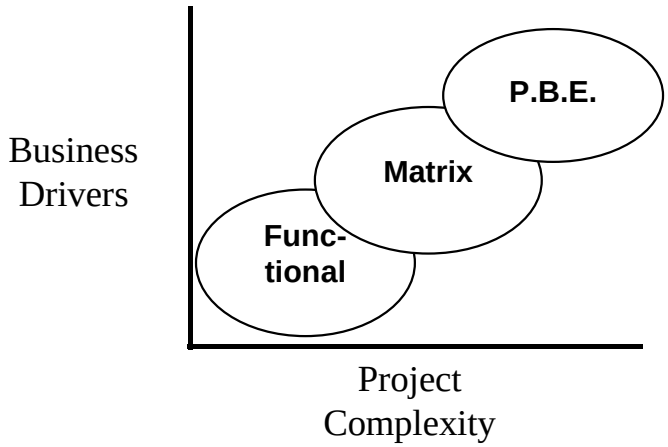
THE FUNDAMENTALS OF MANAGING MULTIPLE PROJECTS

INTRODUCTION

Effectively managing multiple projects, especially large, complex or critical ones, can be, and often is, the career "gateway" to senior business management. The gateway opens because the relationship between project management and the life-cycle of an organization is relatively predictable.

Often times in response to competitive pressure, an organization evolves from a Functional structure into a Matrix structure enabling it to better respond to the business driver of customer demands. As the benefits of project management are realized, or as the competitive pressure continues to mount and more of the business drivers that determine success demand larger, highly complex project-based responses, the organization evolves again into a Project-Based Enterprise (P.B.E.).



As organizations pass through these evolutionary stages the people most qualified to understand and respond effectively to market pressures are those who's skills have been refined in the fire of managing multiple projects. Managing multiple projects focuses one's understanding of the interfaces between business management constraints and satisfying customers.

The presentation and discussion of this session are set against this backdrop. It is divided into five parts.

PART 1: UNDERSTAND GOALS, CHALLENGES and FRAMEWORK
PART 2: BALANCE TIME, COST and QUALITY
PART 3: CATEGORIZE – PRIORITIZE – OPTIMIZE
PART 4: SCHEDULE ACTIVITIES or WORK PACKAGES
PART 5: MANAGE RISK

PART 1: UNDERSTAND GOALS, CHALLENGES and FRAMEWORK

The goals of managing multiple projects.

- Successfully complete the maximum number of projects possible
- Optimize stakeholder relationships
- Maximize resource effectivity without burning out human resources
- Minimize cost and risk

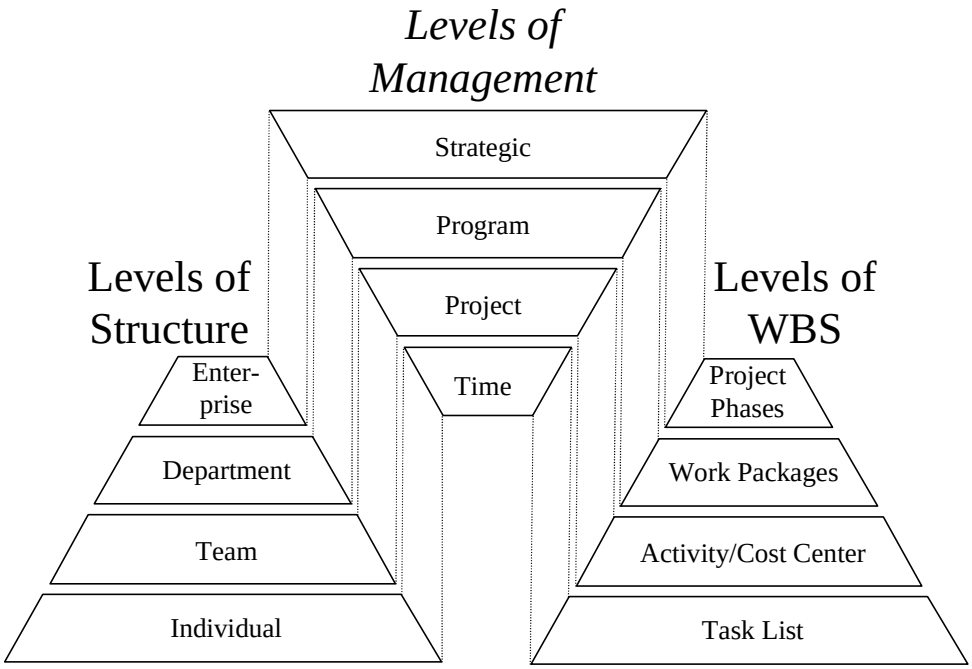
The challenges of managing multiple projects.

- Prioritization
- Getting results without authority over shared resources
- Managing stakeholder expectations and relationships
- Lack of accurate, timely, and adequate information

The critical success factor – becoming DEDICATED to management!

The benefits of adopting a "Framework" perspective.

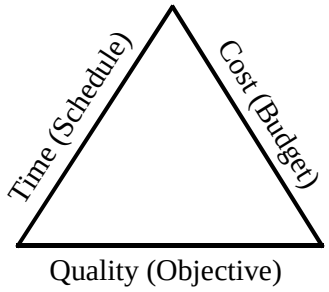
Understanding and applying the Structure – Management – WBS approach provides critical insight into where Program Managers must focus their efforts. In this discussion it also facilitates the discussion of WBS deliverables in the context of structure and management levels. For example, at the individual level a deliverable is a task, while at the program level a deliverable is a work package.



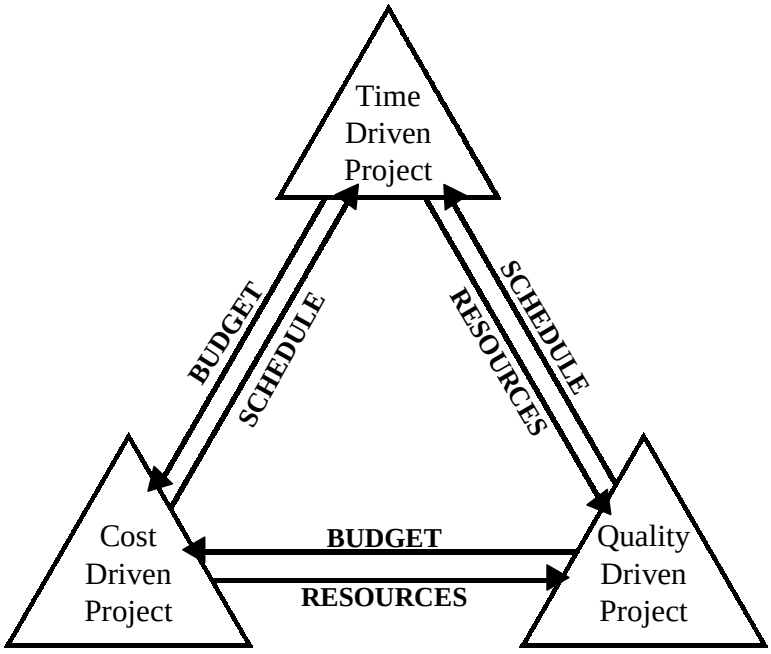
PART 2: BALANCE TIME, COST and QUALITY

In order to have an effective discussion of management in multi-project environments, we must take an established foundation stone of project management – the Time, Cost, and Quality triangle – and enhance it into a three-dimensional model.

In basic project management it is recognized that the three attributes of every project – time, cost, and quality – are closely triangulate. The old saying goes, "Time, cost and quality, you can choose any two." That means that for any project you can define the requirements of two out of the three, but only by allowing the third variable to compensate so that the triangle stays intact. Understanding and accepting this simple premise provides the foundation for extrapolating how to effectively manage many projects. The extrapolation is accepting that different projects have different primary drivers of success. The project must remain triangulated, but every project is primarily Time driven, Cost driven or Quality driven. By recognizing this we can created the needed three dimensional model.



By identifying which projects are Time, Cost or Quality driven an appropriate balance of Schedule, Budget and Resource assignments can be made. Time driven projects acquire scheduling opportunities from the other two types of projects by trading budget and resource opportunities. Likewise, exchanges for Cost and Quality driven projects are made as illustrated. The result is that fulfillment of deliverables are optimized according to the customer's primary or driving motivation.



PART 3: CATEGORIZE – PRIORITIZE – OPTIMIZE

A second foundation stone to having an effective discussion of management in multi-project environments is the recognition of a dichotomy within the overall universe. There is the "Programs" galaxy that orbits around a central need to achieve "Shared Goals". There is also the "Unrelated Projects" galaxy that orbits around a central need to harness "Shared Resources".

Categorize.

For programs the primary categories of deliverables are the shared goals. Use the following three drivers as sub-categories for deliverables within goals when managing programs and as the primary categories when managing unrelated projects.

- Time Constrained
- Quality Constrained
- Cost Constrained

Prioritize.

Prioritizing means ranking the deliverables. In both galaxies, setting priorities must be aligned to managing customer expectations. It is important to remember that in the long-run there are no CONDITIONAL commitments retained in customer memories. For every deliverable you must identify and document:

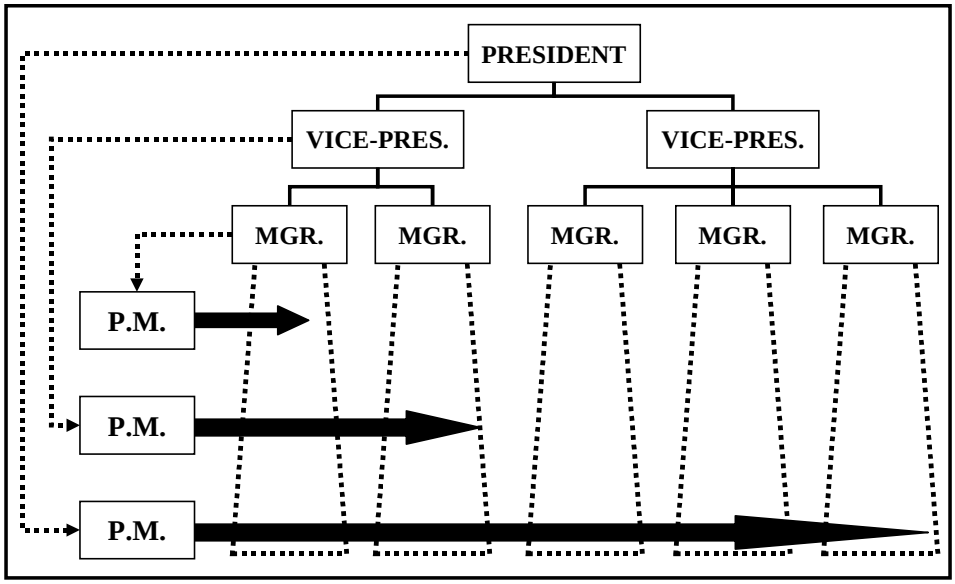
- Required Features
- Supporting Features
- Desired Features

Once the deliverables have been categorized and ranked it becomes important to analyze each deliverable. A Quantitative Analysis needs to be performed to understand the MAGNITUDE of a deliverable. A Quantitative Analysis can include any of the following:

- Cost/Benefit Ratio
- ROI
- Payback Period
- IRR

Also, a Qualitative Analysis needs to be performed to understand WHY a deliverable is being done. An important part of the qualitative analysis is to define the impact of organizational politics on the deliverable's priority. The relationship between sponsorship, authority and importance needs to be understood.

Always consider sponsorship, authority and importance.



Optimize.

Categorizing and prioritizing deliverables are the first two steps to effectively managing multiple projects. These are the required predecessors to the value-added step of optimizing total performance. Optimization utilizes the information acquired in the first two steps to find the best balance when applying resources to accomplishing the work required to fulfill deliverables.

The process of optimizing Programs is:
1. Rank Program Goals
2. Rank Project Deliverables Within Program Goals
3. Identify Constrained Resources
4. Align Most Qualified Resources with Highest Ranked Deliverables
5. Reduce Specifications on Lower Ranked Deliverables
6. Identify Triggering Events and Alert Levels
7. Implement Risk Management

The process of optimizing Unrelated Projects is:
1. Rank Project Deliverables
2. Assign Most Qualified Resources to Highest Ranked Deliverables
3. Identify Time Constraints and Quality Issues
4. Adjust Specifications on Lower Ranked Deliverables
5. Identify Triggering Events and Alert Levels
6. Implement Risk Management

PART 4: SCHEDULE ACTIVITIES or WORK PACKAGES

We now have a complete enough understanding of the project requirements to be able to effectively manage inter-project dependencies and execute the work requirements of agreed upon deliverables. The process of scheduling Activities or Work Packages will build upon the foundation we have already laid.

It is important to note that whether you schedule at the Activity or Work Package level is dependent upon the level of management you are exercising and the level of structure with whom you are interacting. It is also dependent on the level of experience of the team member with the activities being completed and your faith in their ability. The higher the level of management, structure and faith the higher the level of scheduling and the lower the level of detail.

Define Coordination Points

In addition to the Activities and Work Packages used in basic project scheduling, artificial coordination points need to be defined for use in multi-project scheduling.

For Programs, coordination points have the following characteristics:

- Interface specifications that define the specific acceptance criteria of the subsequent work activity
- Component level test specifications for use prior to program integration
- Definitions of triggering events and alert notification requirements
- Approval requirements for work authorization and milestone acceptance

For Unrelated Projects, coordination points have the following characteristics:

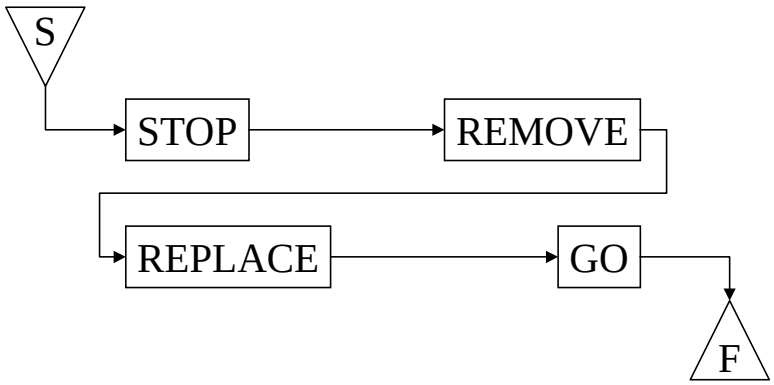
- Work estimates bound by internal (or external) contract assurances
- Work completion specifications that define the specific acceptance criteria that must be met before resources may be reassigned
- Component level test specifications for use in work completion assessments
- Definitions of triggering events and alert notification requirements
- Approval requirements for work authorization and milestone acceptance

Once the coordination points have been defined we can create the multi-project schedule using the same tools applied in basic project scheduling.

Scheduling Tools

When we speak of project scheduling we are usually referring to two disciplines or tools. The first discipline is the development of a Logic Network. The second discipline is analyzing the logic network using the Critical Path Method. These two disciplines provide insight into areas that are often vague and have a high probability of becoming problems without effective management. That insight can then be used to focus appropriate resources and effort in order to keep the project on schedule and free from obstacles.

The development of a logic network requires that dependencies between activities or work packages be accurately and completely identified. Those dependencies show what activities and events impact the start of an activity, and also what subsequent activities and events are affected by the completion of a prior activity. When the dependencies of any group of activities are then considered, they can be seen as interdependencies. Scheduling is the application of knowledge and effort to assure that the outputs of any given activity are in fact the required inputs of the subsequent activity, and that the type of dependency is correctly assigned.



Considering the need to change a flat tire provides a simple example. The diagram indicates a start point, usually by a triangle identified with an “S”, followed by the activities: (1) stop the vehicle, (2) remove the flat tire, (3) replace it with a spare tire, and (4) return the vehicle to a state of going forward. The diagram indicates the process is finished with a triangle identified by the letter “F”.

Creating a logic network can be accomplished by methodologies as simple as placing each Activity or Work Package on it’s own Post-It note and arranging them on a whiteboard or flipchart and diagramming the arrows indicating predecessor – successor relationships. Of course, since dependencies can be Finish-to-Start, Start-to-Start, and Finish-to-Finish you may also find the need for more sophisticated software. Once the logic network has been created, analyzing it can begin.

The best-known and accepted tool for schedule analysis is the Critical Path Method (CPM).

CPM helps us ascertain two vital pieces of knowledge and communicate them to other stakeholders. First, which activities or events, if allowed to slip, will cause a directly related slip in the completion date of the project. Second, which activities can directly improve the total performance of the project. In order to accurately understand, and communicate, either piece of knowledge it is imperative to use two terms, 'critical path' and 'float' (sometimes referred to as 'slack') correctly.

When a logic network is created for a project there are usually activities happening simultaneously in several different facets of the project. There may be activities producing the actual deliverables, there may be activities producing supporting documentation, and there may be activities assuring the quality of the other two facets. These different activities often occur on separate parallel “paths” of the logic network.

One of the paths represents the shortest time in which the project can be accomplished. It is the critical path because any overrun in the duration of accomplishing an activity or delay in beginning an activity will cause a delay in the completion of the project. The duration and start of every activity on the critical path is time critical, regardless of whether the activity itself is of high importance or mundane.

Determining the critical path is accomplished by completing several mathematical computations in a given order. That formula is the Critical Path Method and we will cover it in more detail in a moment.

The second term to understand is ‘float’. We prefer the term float even though there is no clear-cut majority or authoritative position that maintains that it is superior to the term 'slack'. In our experience however, the use of the term slack often leads to challenges by senior management to "remove the slack and meet the scheduled delivery date.”

Critical Path Method

In common practice each activity on the logic network is represented by a CPM Diagramming Box with multiple cells of information. This illustration shows a nine-cell diagramming box. Calculating the critical path begins with estimating the work duration of each activity.

EARLY START DATE	DURATION	EARLY FINISH DATE
ACTIVITY NAME or ID	**ACTIVITY OWNER** **PLANNED COST**	**COST TO CRASH** **MINIMUM TIME**
LATE START	FLOAT	LATE FINISH

At first only the activity name or identification and duration can be completed. Each of the other cells – early start date, early finish date, late start date, late finish date, and float – are filled out as the calculations are completed. (For the purposes of our discussion we will not be covering the use of the cells that contain the owner, planned cost, cost to crash and minimum time. They are part of a more advanced methodology than we have time for in this "fundamentals" session.) Briefly, the definitions of each cell are:

- Activity name or identification is typically a unique, text-based description that facilitates recognition of the deliverable represented by the activity box.
- Duration is the number of time periods required to complete the activity. Time periods are typically days, weeks or months. Durations are normally expressed in work periods. By expressing duration in work periods, scheduling software with integrated work calendars can automatically adjust for weekends, holidays and other breaks.

Calculating the critical path requires, first, a "forward pass" through the entire network where the early start is added to the duration to determine the early finish (ES + Duration = EF). By definition, the early start of the very first activity is zero. Then it requires a second "backward pass" through the entire network where the duration is subtracted from the late finish to determine the late start (LF - Duration = LS). By definition, the late finish of the very last activity is equal to its early finish. Finally, the last calculation where the early finish is subtracted from the late finish equals the float (LF - EF = FLOAT).

Briefly, the definitions of each cell are:

- Early start date is earliest date on which all preceding activities will be complete thereby allowing work to begin on the designated activity.
- Early finish date is the earliest date when all work can be completed on the designated activity.
- Late start date is the latest date upon which work can begin on the designated activity without delaying the completion of the project.
- Late finish date is the latest date upon which work on the designated activity can be completed without delaying the completion of the project.
- Float is the number of time periods the early start can be delayed without delaying the completion of the project.

Once the calculations have been completed, the critical path can be identified by tracing the path of activities with zero float. Again, it is the critical path because any overrun in the duration of accomplishing an activity or delay in beginning an activity will cause a delay in the completion of the project.

PART 5: MANAGE RISK

Having created the logic network and calculated the critical path, a Program Manager can now use that information to formulated appropriate risk management plans.

Risk Management Planning Process

Step 1: Identify and Categorize Risks

- Human Resource Risk
- Technology Risk
- Administrative Risk

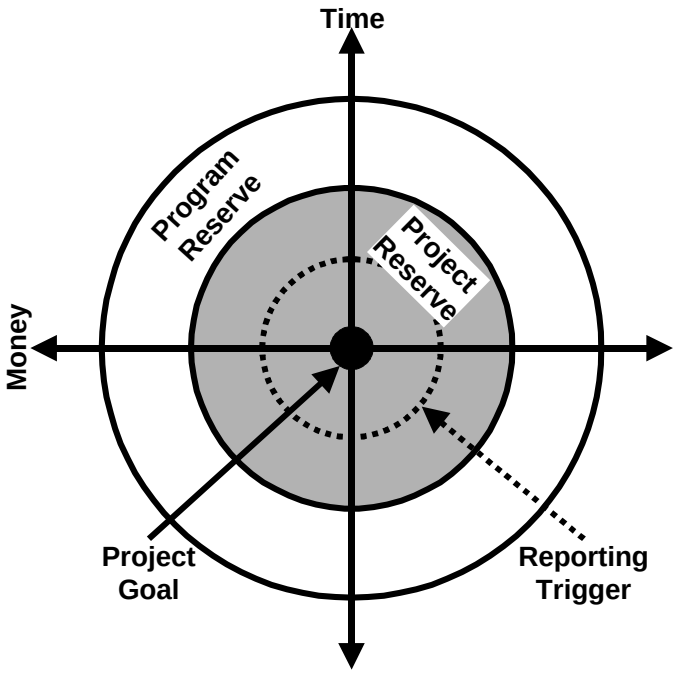
Step 2: Quantify and Rank Risks

- Probability
- Severity (in Dollars)
- Impact (in Schedule)

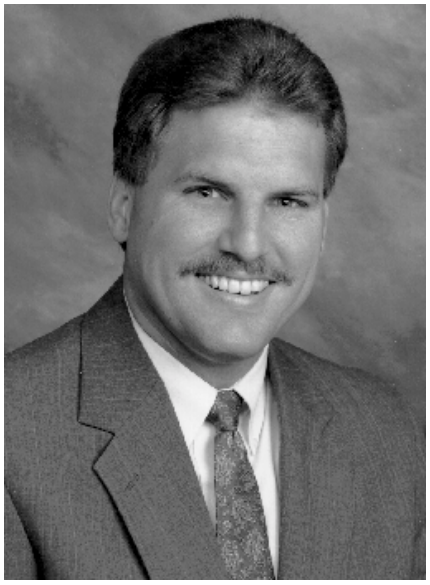
It is important to fully understand the probability of schedule slippage as well as the likely magnitude of slippage.

Step 3: Plan Risk Mitigation

- Identify Triggering Events
- Define Options
- Delegate Contingency Resources
- Acquire Management Reserves



CONCLUSION



Finally, it might interest you to know that as the founder of Pareto Principals I have devoted over 25 years to improving the performance of client organizations. Together with the rest of our organization *we help clients develop well-grounded, business and information-technology visions that deliver the ability to outflank competitors, deeply penetrate new and existing markets, and set and achieve strategic goals.* A partial list of clients includes Lucent Technologies, Visa – Smart Cards, Oracle Corp., U.S. Marine, American Gypsum, Newell Rubbermaid, Interex – The International Association of Hewlett-Packard Computing Professionals, and Comdex. Our clients look to us for measurable, practical, performance-enhancing solutions to meet real needs.

At Pareto Principals we look forward to enhancing your success. We would be happy to answer any questions or to discuss any potential engagements, so please feel free to contact us. We look forward to the opportunity to serve you!

One question that regularly comes up is the origination of our partnership's name – Pareto Principals. The first part of our name is a tribute to Wilfredo Pareto (1848-1923) an Italian economist and political sociologist. He observed and articulated the principle of the trivial many and the critical few, also known as the 80:20 rule. Pareto's principle states that in most undertakings 80% of the value can be achieved from just 20% of the effort. Therefore, the remaining 80% of the effort delivers relatively little advantage. We use his name to remind us to avoid the "tyranny of the trivial." The second part of our name is a word play on principle. We are principals – that is partners – who apply his principle – that is rule. We beg your forbearance with our attempt at being "punny."

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