TAMING TIME – TIME IS THE ONLY PERISHABLE RESOURCE[1]

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Many project managers consider time management to be schedule management. Time management requires methods and tools beyond that of Critical Path. Learn to Tame Time at all levels and at all phases of the project. Time changes – by texture (what it feels like), by tempo (in the beat, how rapidly it is happening), and by velocity (how fast it is burned). The irony with time is we consume it even when we do not use it! Money, Materials, People, Equipment, and Information remain if not used. Time is not there – it is gone whether you use it or not. Time is the only perishable resource.

TIME IS THE ONLY PERISHABLE RESOURCE

Time is the only resource that perishes hour by hour, minute by minute. You never have another today – tomorrow is a different day – today never can be recaptured. We can waste other resources but usually can buy more. If you do not use the other resources, they are there tomorrow. Today is not there tomorrow nor can it ever be bought back. We talk about buying time but that is a charade. We change scope, we change methods, and we do concurrent work. We do not get another new minute.

We have to accomplish, perform, as much as possible today – we never get another chance to use today's time for work.

We do have to tame time, to make time our ally, and to make time work for us.

Project Management is about time management. Project managers have to focus on getting things done right – efficiency; getting the right things done – effectiveness, and getting the right things done right at the right time – efficacy. Scheduling only addresses getting things done at the right time. This can be the wrong: things done right or the right things done wrong OR it can be the right things done right at the wrong time!

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PROJECT FUNDAMENTALS

Originally, I thought project management fundamentals were time, cost, and quality – the triple constraints. Our mentors, our bosses, and our peers beat the triple constraints into us. Our problem is we cannot control time, cost or quality. Notice that time does come first. We are to deliver our projects on time. We miss more delivery dates more often than we chose to believe. Last week, a client said they had never met a product development date.

Then I thought the fundamentals were results, scope, and time. Again, we do not really control time. I now believe project management fundamentals are four: results, scope, performance, and risk. Only in the term 'performance' do we encompass doing the right things the right way at the right time. Performance is about completing the scope – the amount of work required to produce the deliverables of scope that in turn produce the result. Risk is simply the **variation** within Results, Scope, and Performance – both positive or opportunities and negative or threats.

PROJECT FUNDAMENTAL – RESULT

Our mission, our purpose, and our gestalt as project managers is delivering required results. Everything else is superfluous. Success only happens with required results (Success does not always happen with the results but without the results, there is no success ever!).

One benefit project management brings is predictability – delivering the result when it is promised, required, and necessary. Time-to-market with a product with some features may be more important than producing a product with all the features. The result may often be useless if it is not on time. We have consulted or managed four theater projects: the opening date is immovable! Being late is not an option! Yet in each, the project team struggled to hit that date. Backward scheduling was more prayer than plan!

Be careful when being on time and within budget is more important to our archaic budgeting processes than producing required results. Much budgeting is based on 'no surprises' than on producing results as rapidly as possible.

PROJECT FUNDAMENTAL – SCOPE

> *Scope is the first step in taming time – doing the right things – effectiveness.*

We produce the required result by completing work. I believe the work-breakdown-structure is crucial to defining scope. What we miss in 'deliverable-based scope' is the scope. We must know as part of the WBS is the effort – labor hours for each work item, the duration – how long the work will take, what team or crew is necessary to do that work in that duration, and the cost. We will continue to have problems with scope as long as we do not estimate all the elements that constitute the amount of work required to produce the result.

Some project managers say that this is planning rather than defining scope. I do not agree. This is crucial order of magnitude estimating which can be done rapidly. We need to get the size of the ballpark and make sure we are inside that ballpark. Many times management has no clue how long or how much things cost. When they learn, the project magically disappears before spending effort, time, and money. The danger is expending scarce resources because we do not know the order of

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magnitude. When we know the scope – the amount of work, effort, duration, cost – we then only do projects that have sufficient return to be viable (in our project selection process).

The scope of that work should be sufficient to produce the required results but no more and not less. Scope is the amount or the number of work items that has to be completed to produce the results. By carefully defining scope, we tame effectiveness – doing the right things and only the right things.

By defining scope with duration, effort – labor hours, crew or team, and estimated cost, we also do the right projects.

Scheduling is more than organizing the work for completion; scheduling work is similar to conducting an orchestra. In scheduling, we move work across the resource or we move resource across the work. Both are arts. This is determining where work is accomplished by which resource and when.

I discovered why homes seemed to take forever to build. A college classmate builds homes in 42 days; other developers take six months to do the same square footage house. Others may take two years. In this latter case, one subcontractor is in the house at a time so there are no work area conflicts. The 42-day manager stops work if one subcontractor gets out of phase. They are truly an orchestra.

We have covered the first two project management fundamentals of result and scope as well as the first means to tame time – effectiveness. The third fundamental of performance is where time is the essence – that is a legal term meaning the use of time to produce results is the being, life form of the project. Performance is doing work, completing the list of work in the scope.

> Ever look up scope? One meaning is a nautical term denoting the length of anchor line let out to allow a proper angle between the anchor and the boat. Any less line may not allow the anchor to hold and cause it to drag. How well we accomplish that work is measured by our various rulers of time, cost, quality, scope.

MEASURING EFFECTIVENESS

Effectiveness is tied up in doing things right. We ensure the piece of scope is necessary work. When we spend labor hours, we must spend them judiciously. Inexperienced PM's include lots of unnecessary work. Identifying necessary work is the art of being a project master.

Well defined scope and work-breakdown-structure eliminate superfluous work. Scope creep in many cases is caused by incompletely defined work-breakdown-structures.

We need to know all the work required, but of that work required, what is required and what is wished for. We have to deal with required not wishes both in scope and in the work-breakdown-structure. We have to be sure we only do what is required to produce the result – nothing more. Just what is that work? Effectiveness – doing the right things – is doing the work in the WBS.

We measure effectiveness indirectly. We ask others to glean the work list. We can measure the work-not-completed when the activity is done. We can listen to complaints and adjust the work list. We can review the work with team members. We can also put durations and labor hours against each

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work item so we measure the impact on scope by the changed work. Change measures quality of scope definition and work-breakdown-structure. What is your change within a project? We believe that change of more than 5% of the total labor hours, total duration, and total number of activities is an indicator of poor project methodology. Change most likely caused by lack of investment in planning.

PROJECT FUNDAMENTAL – PERFORMANCE

> *Taming effort and duration*

Performance is governed by the methods or procedures of work. A crew or team of resources – not just people accomplish these methods of work. Methods depend on materials (how much value has been added to the material as well as the technology (PVC pipe versus copper) of the material?), equipment, skill of the people (not just the number), supervision (quantity, quality, planning skill, teaching skill), and information (plans, drawings, research, procedures, technology). Change any single resource changes the method changes the performance. Change the performance and the duration changes.

The method controls labor hours of work – the efficiency of doing things right. The method is controlled by the mix of resources producing work at an assumed rate. This in turn dictates the duration of the task. Amount of work divided by rate of work produces duration of work. We must be certain we choose the right methods, have the people skilled in that method, with the right resources, given the right expectations, and to do the right work. Do you hear all those rights? Right way, right skills, right expectations, right resources, and at the right time, in order to complete work in the right time (duration)!

We must be sensitive to both labor hours or effort and to duration. Change the rate of spending labor hours and you will change duration. Change duration and you may be forced to change the rate of spending labor hours.

We have to manage both kinds of time carefully. Changing either one may increase or decrease the other. Reducing duration may increase the number of labor hours to be spent due to waste or inefficiencies.

Some project managers believe they do not have to manage at this level. All they have to do is produce the deliverable – the outcome of that piece of the scope. I am uncomfortable with this. When the deliverable is late, it is too late to fix the problem. I believe a project manager needs to assure – remember quality assurance? – all the variables are fixed within a task. That does not mean the PM makes all those decisions, just that the PM assures that all the decisions have been made. And that those decisions and their impact are known.

Both the Naval Facilities Engineering Command and the Army Corps of Engineers use a quality program that requires general contractors to research the quality specifications and work methods for each type of work – concrete, steel, masonry, etc. This learning is reviewed with the subcontractor's and general contractor's supervision before beginning each type of work. There is learning in this for the rest of us in project management. I have been told the work progresses faster, more rhythmatically, with fewer problems. Everyone knows quality standards, work methods, tests, and the standards.

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We focus on schedule and pretend the underlying methods are not our problem. Management says people are empowered to fix problems but do not enable people with resources. We as project managers must assure that the people are enabled – given the resources to do the work. We do not always have state-of-the-art resources but sometimes that is not necessary. We still cannot build high-rise buildings any faster than the Empire State Building.

One of our key project management roles is to coordinate resources – money, time, people, supervision, materials, tools, equipment, and information – required by the method. If we cannot coordinate resources, we must look at what resources we can provide and then what methods can then be used.

> Remember this: much project risk (that fourth fundamental of
> project management) lurks within the quality, quantity (availability),
> price of resources and productivity (waste).

When we execute methods well, we have tamed efficiency – doing things right – the energy or people power that is expended to do work – the effort or labor hours it takes to do an activity. Labor-hours are the currency of project management. We spend labor hours to accomplish work.

We now have a piece of scope completed efficiently – as rapidly as possible by the effort or labor hours expended. We accomplish this by selecting methods, by coordinating a myriad of resources, and by ensuring good management of the effort.

We have also tamed the duration of the activity. We have not yet tamed efficacy.

MEASURING EFFICIENCY

How do we measure that the work is completed efficiently? By measuring the effort expended against the planned effort and the actual duration of that piece of work.

Now here is the danger of allocating too big a duration. 90% of all work is accomplished after 50% of the time to the deadline has passed. I believe that the duration should only be as long as the work takes – not the two weeks for the two hours of work to take place. The rest is float. Let me say that again. The durations should reflect the amount of time needed to actually complete the work. This is a trap that project mangers fall into. There is no way to verify the efficiency of the work if the durations are disconnected from the labor effort.

Remember that you can still have milestones and deadlines which are separate from the duration and effort. We try to mix resource balancing, labor or effort hours, and durations all into the same step. This violates CPM principles – something each of you do daily because CPM principles are not taught.

Goldratt says our duration should be based on probabilities. That means duration should have a 50/50 chance of being achieved. This statement generates much thought about efficiencies, methods, planning. If you have trouble with durations, use PERT time calculations. Four times Reasonable Expectancy plus Best Case plus Worst Case divided by six to get an Expected Duration. How can we estimate a 50/50 chance which is essentially a coin toss?

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From measuring actual labor hours, measuring actual durations, measuring actual progress and comparing against the plan, measuring earned hours (earned value) and comparing that against both the plan and actual, we can determine our efficiency of doing things right.

SCHEDULING IS EFFICACY

Doing the right work, the right way, at the right time.

Now we are left with efficacy – doing the right things right at the right time. This is project mastery. We schedule work juggling resources, results, scope, time. Once we schedule, we then can measure our efficacy. Schedule compliance is a direct measure of the efficacy of our project. Day-in-and-day-out for intense projects, week-in-and-week-out for less intense projects. We measure how well we are completing the work we say we will complete it against the scheduled completion.

When is the best time to do things? We talk about resource leveling. But this does not accomplish the best time, it only establishes the best time when the work can shift while holding resources constant. We either move resources across work or work across resources.

I like to do things as early as possible so that I know they are done. I do not like work floating. Here I do like Goldratt's bundling up float into buffers – pull the float out of the schedule – use activities with duration but no effort (labor hours). Time or duration can be reallocated with a change control process but you will now have an alarm go off to tell you to pay attention: Float is being consumed and that an activity is moving off schedule.

MEASURING EFFICACY

We measure how well we are completing the work we say we will complete it against the scheduled completion

BUILDING A SCHEDULE IS A COMMUNAL ACTIVITY.

Schedules are more important as communication tools than as a control tool. Use it to communicate. Many times schedules are too complex for people to understand. Put the schedule in a bar chart or time scaled Precedence. It is helpful to walk the schedule with the players. Many times.

We think one or two dimensionally. Schedules help us think in three dimensions. I suggest that there are many more things that can be addressed using time as that third dimension.

Scheduling brings a sense of urgency to completing project work. Deadlines impose accountability onto the workers of a project. Use fail-safe deadlines; do not create deadlines that are so tight that missing one jeopardizes the entire project duration. Build some contingency into the deadlines.

Ninety per cent of work is accomplished after fifty per cent of time to the deadline has passed.

If you cannot see the work flow, you cannot put it in a computer. Use the Sticky-Path-Method℠ and do the Sticky-Shuffle℠ to see and feel all that is happening in a project. Use rolls of white paper

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with every two weeks marked. Let each player put their effort on the project. Each player can talk through their roles. Then you can put it in a computer. This engages the body, mind, and emotion. It allows lots of different small groups to work on parts of the schedule at the same time.

For reviews of the schedule, project it. Projected-Scheduling allows everyone to see. I have successfully with small groups used this rather than the Sticky-Shuffle^{SM}. This does not engage the body but it does engage the mind.

Once the schedule is completed on the wall, walk through it. This can also be accomplished using the Projected-Schedule.

Many of your project team are not dedicated. They are not full time on the project. However, for brief periods of time, they should be dedicated to your project. This is another Goldratt concept. When they pick up a piece of work for you, your team member should only put it down when a deliverable is completed – measurable, tangible, touchable deliverable. The tendency is to pick up and work then put down without finishing without coming to a stopping point because something urgent superseded it.

PLANNING TIME SAVES TEN TIMES ITS WEIGHT IN EXECUTION TIME

Remember that planning time is easily squandered because planning time flows at a different rate. The stress to produce is not there. Plan the planning time. Create a project schedule for planning. Many times we focus on the project and forget the project process. 90% of the project process is planning – time when the project is not being worked. Planning is the key to quality of the project process. Planning dramatically reduces risk in a project.

Knowing this what happens? We fall into the planning trap. We do not have time to plan; we have to get to work. But we do not ever have time to do it right the first time, but we have time to do it over.

Time flows at a different rate for functional managers. Many people do repetitious work, day in day out. Project work is temporary and will go away. They tend to treat project time of any kind as the routine work by doing it whenever time appears.

Procurement is in a world on to itself. Just getting the resources to the project may be sufficient. However, it is extraordinarily difficult just to make something appear at the right time. Suppliers are great at making promises that their delivery systems cannot complete.

STOTT – ADDING POWER TO SCHEDULING

Strategic, Tactical, Operational, Task/Tools – the levels of planning

Think about the levels of scheduling – STOTT: strategic, tactical, operational, task/tools. Much of scheduling is tactical and operational.

STRATEGIC

Deadlines, phase lines, briefings, project reviews, deliverables, decisions are all strategic issues for a project. You can set the tempo of a project by the frequency of project review meetings. I have seen these twice a day or monthly. What is your plan of attack, your concept of operations?

We will revisit Strategic after be become intimate with the project.

TACTICAL

One – walk the project by time

Look at what is happening as you move through time. Walk each week, each month.

Two – walk the project by territory

This is quite appropriate for construction. For other work this may be by deliverable. What is required to produce each deliverable. This is different from walking the schedule by functional area – that comes next. Literally go to the area and talk about what takes place at that physical location. We recently had one area in Indiana, another in Massachusetts, a third in Ireland, and a fourth in England.

You may look at this as walking the project by deliverable. Talk about what all has to happen to produce that deliverable, when, and the risk that may impact the time, cost, quality of that deliverable. Note that you are still using the schedule but you have taken a very specific section – a frag-net – to analyze.

OPERATIONAL

Three – Walk by entity or specialty, functional area or technology (time, territory, technology)

Walk the project by the contractor, by function, by type of work. What do they have to do to fulfill their responsibilities? This is a schedule or work list by specialty. This may be done privately as well as with the whole team.

Four – Walk by resource

Resources are people, supervision, information, material, tools, equipment, money (remember what we said before about methods), and money (flows). Each resource needs a management plan. That plan has to deliver the right resource at the right time. Some projects may need a plan for the delivering of the right individual at the right time. Each resource flows in and out of the schedule. When and where is it needed? Is there a management plan for each resource? A schedule should also be as part of it.

TASK / TOOLS

Five – Walk the project by person by hour.

Some projects need a schedule or plan for each person every day by hour. Know when that micro-scheduling is needed. For what events? For what milestones? Frequently this is a rolling schedule looking out two or three weeks.

You might consider a one month look ahead – every week.

Scheduled for a contractor what each person would be doing each hour for five days. We saved one person. People keep too big a reserve, safety factor, in how they allocate people.

Does it need to be by person by hour or can it be by half day or full day. Schedule next week by half days, what will happen in the morning, in the afternoon.

Measure compliance by day, by half day, or by week. I like measuring compliance by week and then by day.

STRATEGIC

Six – Control Processes

Walk the team across the project. What is happening within and without the team during the project?

There are half a dozen team processes that take place for a team to work well. What is going on with those team processes during the project?

Project Managers manage resources – results, risk, resources. Project Leaders deal with vision, values, and people. What is the schedule for each? What happens with each across the schedule?

Crucial to delivering the required result is control, oversight, supervision. Just how are you going to control that project. Walk the project by time and talk about what you will do at the various steps to oversee, to ensure everything is happening according to plan. Then what will you do to adjust the plan or schedule

Our biggest failing is not scheduling our own work – it is called time management. Do you schedule your life this way? Well-organized people do. If you are like me, we work off of lists, however the urgent overwhelms the vital.

Each metric as with each resource has a management plan and schedule. Walk the project by metric and feel how it evolves, progresses, varies. Walk each fundamental: walk reliability of the project methodology, relationships, learning: finally time, cost, quality.

Seven – walk the critical times – time slices.

This is an analysis of what is happening. You can look at everything that is happening at a specific point or slice of time. Look at what each entity is doing on the project at crucial points in time. These are the first 5% of the project, 25%, 67%, 90%, various gates, deadlines, any significant deliverable, handoffs, changes in phases, changes in type of work or technology. You can walk back and forth in time around that time slice for each entity. Every time a project shifts phases is a critical time.

You also may look at events. What is happening at key events or operations? Start-up is a key event. Analyze this in detail. This may entail a separate schedule because an event takes place over time. What might go wrong or very right? Note that I talk about both sides of the risk equation. Many people only look at what goes wrong and fail to recognize what might go right.

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In one instance the testing function said there was no fail-safe if the product did not pass the test. This realization caused people to rearrange a previously immovable schedule to build contingency into the test process

Eight – by scenarios

This is risk analysis by a different method. Identify several scenarios that may occur. This is called war-gaming. For example one could be if every thing goes extremely well. What will be happening? Another is extremely badly. What will be happening? The war-game specific things going extremely well or extremely poorly.

Last month we used these scenarios: reducing features by 25%, increasing features by 25%, reducing time by 50%, increasing cost by 50%, increasing time by 50%. This is a brain storm that can lead to valuable insight into issues, threats, and opportunities. We learned a lot about which features reduce time, which increase time, and what can happen if time is dramatically reduced, and how to spend money wisely.

We can write a project plan and a schedule for each scenario. This lets the elephant dance.

Scheduling and the subsequent accountability is a tremendous productivity enhancer. I have improved work completed by 25% simply by implementing discipline in detailed scheduling and the measuring compliance.

SUMMARY

Efficiency: measure labor effort and durations of activities against the plan completed.

Effectiveness: measure changes in labor hours and durations versus those defined in scope. Measure at several points in the project to determine the rate of change. Look at each activity in addition to the entire project – different issues may be causing change in different activities.

Efficacy: measure schedule compliance.

This is also an indicator of management effectiveness.

When building the work-breakdown-structure out of the scope, estimate effort (labor hours) and durations to get a sense of the order of magnitude. We do not gauge scope well and are always surprised that it takes much more effort than expected. Effort also may give a handle on cost of all resources. We can get this quickly if we know the ration of work to resources for expected costs.

Thoughtfully look at productivity of the method or procedure. Use that productivity to determine duration.

Keep effort and duration linked. Use milestones to set deadlines rather than durations.

Create early warning for activities not on the critical path by putting float into buffer activities.

Contingencies need to have duration (total duration of project otherwise you are using float), effort (labor hours), and cost for a specific scope. It may be helpful during risk analysis to figure out what of quality can be dropped or added.

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Walk the project by Strategic, Tactical, Operational, Task/Tools

The eight walks are:

1) Time

2) Territory

3) Technology, Specialty, Function, Entity, or Person

4) Resource

5) Person by Hour

6) Team, Leadership, Management

7) Time Slices and Events

8) Scenarios

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Lee began project management in 1963 building the freshman bonfire at Rose-Hulman Institute of Technology. Service with the Corps of Engineers in Thailand and Vietnam converted Lee from science to engineering. Attending Purdue University on the GI Bill, he earned both an MSCE in construction management/engineering and an MS from the Krannert Graduate School of Management. Lee founded his project management and facilities engineering practice in 1978. Lee's practice includes managing projects, project engineering, consulting, and project training. Projects include sporting events (Pan American Games and International Special Olympics), product development, capital construction, project business management, maintenance, industrial turnarounds, and plant startups. Lee also partners project teams, negotiates quality contracts, and mediates disputes. His interests include planning, scheduling, quality, controls systems, leadership, and learning. Lee can be reached at lpeters@projectLEADER.com, http://www.projectLEADER.com, by phone at 317-873-0086 or 1-888-873-0086, or fax at 1-317-873-0052.

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