

Increasing The Probability of Success
Integrating Process, People, and Tools

Dallas MPUG
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Glen B. Alleman
VP, Program Planning and Controls
Lewis & Fowler
www.lewisandfowler.com

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Smart People. Smarter Results.

Increasing the Probability of Success for Enterprise IT Projects Starts with Credible Information About the Performance of the Project. This information comes from tools.

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When I say the Probability of Success it means that projects are always in some kind of trouble. No matter how experienced, and well planned, how well funded, and especially how good the tools are.

There is always a probability that the project will be in some sort of trouble.

This is a fact of life for projects.

What we need to understand is that managing projects in the presence of this uncertainty – the probability that there will be some sort of trouble – requires careful application of tools and the processes around the tools.

Tonight's talk is not really about tools. It's about applying processes and tools to increase the probability of success.

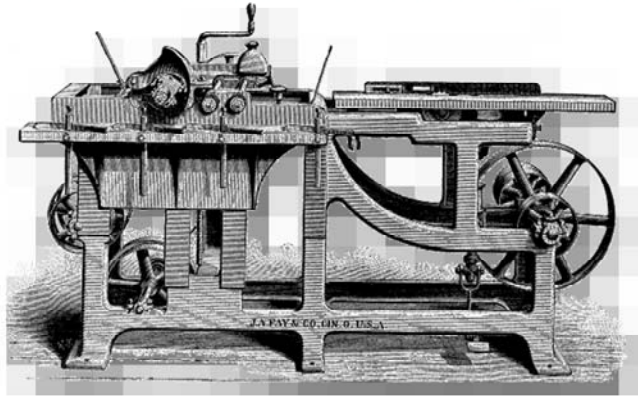
I'm going to speak to you tonight as a tool skeptic. By skeptic I mean as someone who is deeply committed to using tools, using them on the complex, mission critical project and programs.

But all the same a skeptic for one simple reason. Putting tools to work requires a credible process. By credible I mean a project management process that has a chance of actually getting the project out the door on-time, on-budget, and on-specification.

Tools are necessary, but they are far from sufficient.

So for this evening, I'm going to focus on the credible processes that can be enabled by tools and not the tools themselves.

It's Not Really About Tools



- You've seen all kinds of demonstrations of project tools
- This will not be one of them
- We're going to talk about what happens before tools application – the business reasons for using tools
- We'll see screen shots to show how some tools can be applied

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I know you've seen lots of demonstration of tools.

Heard speakers tell you about how to use tools to manage a project. Listened to all the benefits of one tools over another.

Having managed projects since the early 80's I'm here to tell you it's not about tools.

It's also not about people, but a reason that may surprise you. If you don't have the right people, no tool or process is going to help.

If you don't have the right tool, the project can still get done. We do that everyday on the program we manage. The tools are far from ideal in many cases, but work still gets out the door.

It's about the processes that are implemented by the tools, using the right people

But this talk is not about the demonstration of tools. It's about how to implement the right processes using some tools your familiar with.

Today's Learning Objectives



- Cost, Schedule, Technical Performance[†], and Risk are inseparable elements of a project
- Process integrates these inseparable variables
- People are the source of all information, need, and the consumers of business value
- Tools can be used to implement processes, but only the right processes will return the value from the tools

[†]Technical Performance includes all non-cost and schedule elements of the project

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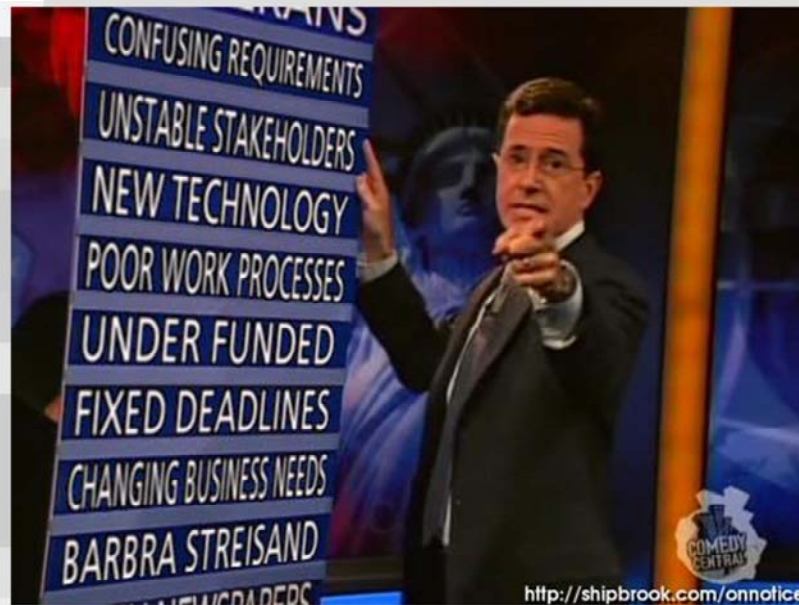
Let's first see at what "done" looks like.

This statement – "what does done look like," is a critical success factor on all projects. If you don't know what done looks like, you'll never recognize it when you get there – if you every get there.

So what are we here to learn about:

- The first thing is that cost, schedule, and technical performance are inseparable. Technical Performance is a word that may not be familiar to some of you. In the Defense and Space program management business – where I spend most of my time – Technical Performance means all the attributes of a program that are not cost and schedule. It's the attributes of the product or service that the customer has bought. The "abilities" of the product or service. These could be as simple as processing data or as complex as flying to the moon and getting alive.
- For these three attributes – process is what integrates them. Not tools. Tools are the physical mechanisms but processes providing meaning to those mechanisms.
- People are the source and consumers of information. They are critical of course, but it's the processes that give meaning to this information that allows the people to make decisions.
- In the end the tools are just pieces of equipment used by the project. Nothing more nothing less. A fool with a tool is still a fool – the saying goes.

So What Are the Real Problems With IT Projects?



So what's the problem domain in which we want to use tools to help us with our processes.

Well these are probably common issues in the domains you work in.

They certainly are common problems in the domain of defense systems and manned space flight.

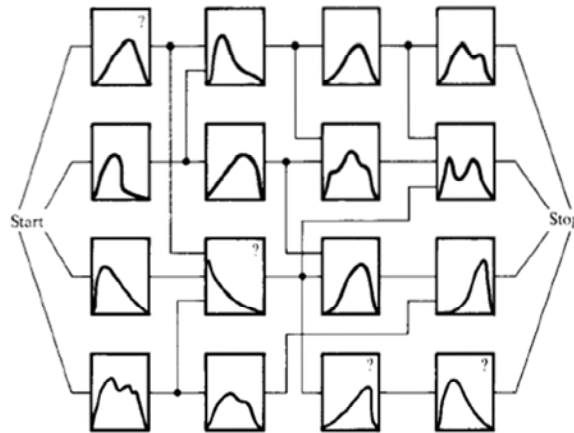
So no matter where you go, the problems are pretty much the same. You can make your own list.

At the core of the casual sources is usually some missing process.

- What the customer wants is not clear, concise, or stable
- The system architecture is changing under neither the project plan

Here's The Fundamental Problem With All Projects

- Having and using tools is necessary but far from sufficient
- Understanding the principles of project management is the next step
- Dealing the statistical nature of project work is the starting point for successfully applying tools to the problem of -
“managing in the presence of change”



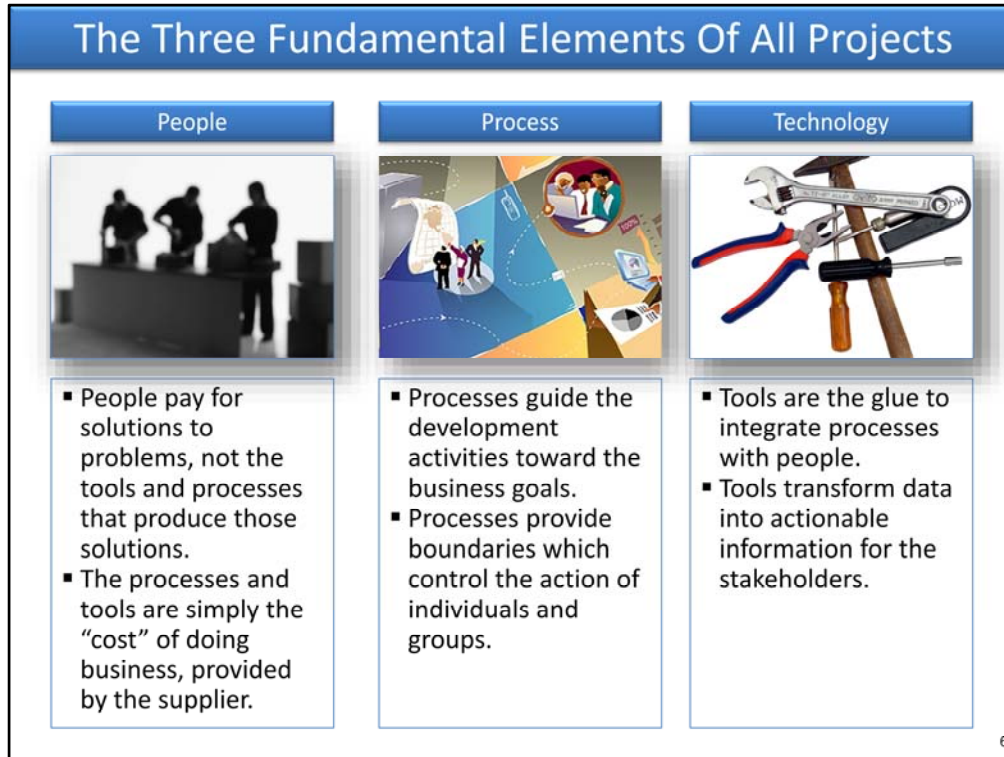
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The first thing we need to understand when we're talking about process and tools is that the world of project management is a probabilistic world. There are very few if any fixed outcomes. Nearly everything is random in some way.

Random means that the measurements of numbers is actual a statistical process, where the value you measure is drawn from an underlying probability distribution.

Let's remember this later where we'll see some tools that provide information about managing in the presence of this randomness. Because this randomness cannot be removed. It is part of the world we live in.

We cannot manage the uncertainties that come out of this randomness, we can only manage in the presence of these uncertainties.

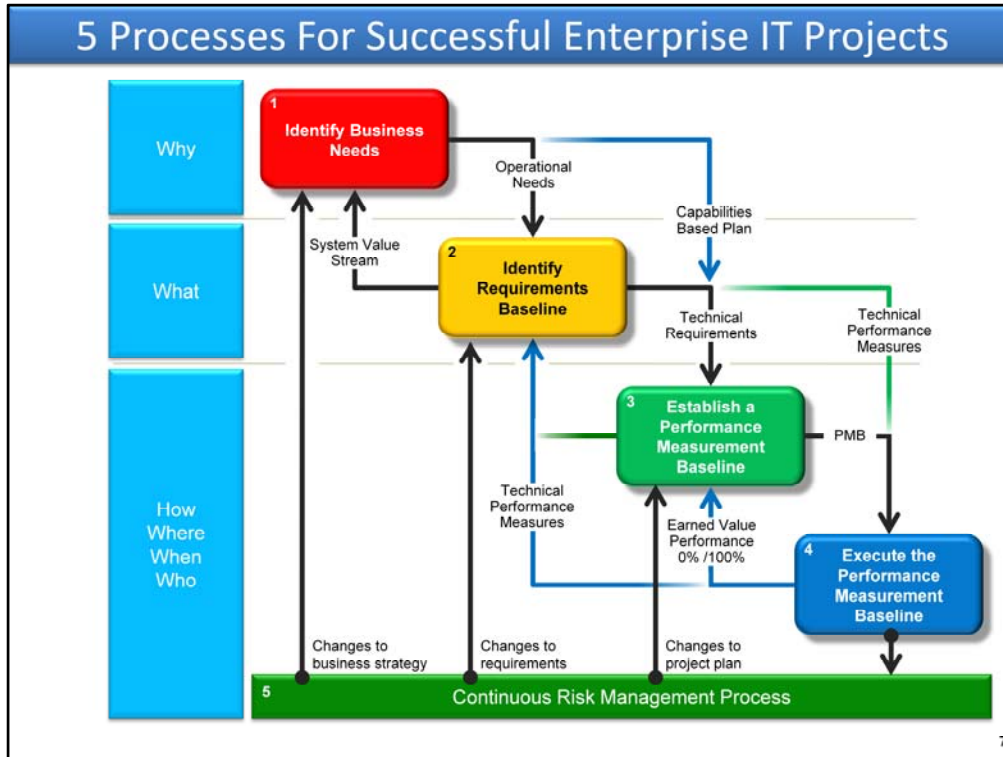


We’ve got the three obvious elements of any project.

People, process, and technology.

That’s been stated up front. But let’s review quickly where we’re going before we start out journey.

- People pay for solutions, they don’t pay for processes or technology. People produce the solutions. The processes and technology are just a means to the end.
- Processes guide the people in the development of a product or service. Some processes are more rigorous than others. Some processes have more formality than others. Some processes come with the tools, some are independent of any tool. Tonight I’m going to speak about processes that are independent of any tool. The tool is simply a means to make the application of the process easier.
- Tools are glue between a process and the people who use the process. Tools transform one view of the project into another view of the project. That’s all. They provide data. The information needed to manage the project is provided by the process. The meaning if the data is part of the process.



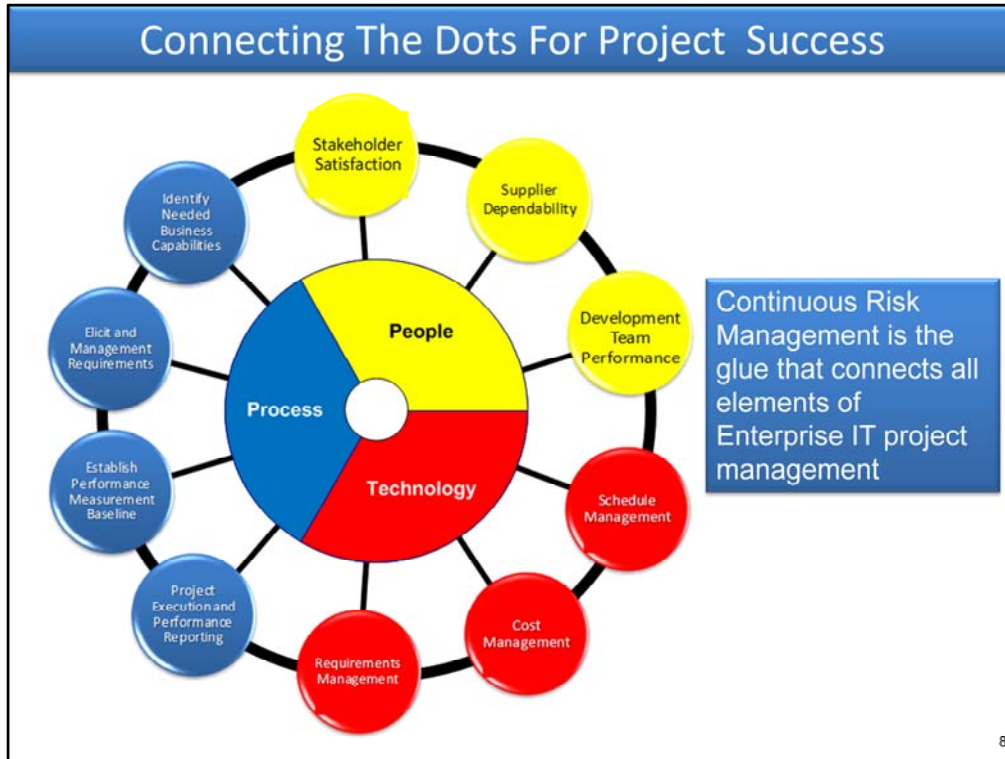
Here's my view of the process world. This view comes from experience, training, and more experience. This view has evolved over several decades, mostly from failed projects.

Projects or programs that failed to perform one or more of these processes and the related sub-processes.

These five process areas – if we use the CMMI Process Improvement framework vocabulary are:

1. We need to know what done looks like in terms of the user. What useful work is the user going to do with the products or services delivered by the project? This question is not always answered. Pretend you had the resulting system next Monday, it was free, and it met all the requirements stated in the requirements document. What would you do with the system? This is called the "System Capabilities."
2. With this information we can derive the requirements. All requirements are derived from the Capabilities of the system. If they are not, they have no home. No reason for being.
3. With the requirements we need a plan and a schedule. A plan is the strategy for successfully delivering the capabilities. The schedule is the sequence of work performed to deliver the capability. They are not the same, both are needed.
4. Next we need to execute the Plan and the Schedule
5. Finally we need to perform continuous risk management for the four process areas.

I'll show you next how tools can support all five process areas.



So let's connect our 5 process areas with the three attributes of a project.

Here's a notional picture of these connections.

In the defense and space business – notional means a picture that “could” be the real way to do something, but it is not actually the way it is done in practice.

In other words it's a nice power point slide of what might take place. But there's more to it than what's shown in the power point slide.

Let's Skip the Processes and People and Move To Our Topic



What tools are needed to support the People and Processes?

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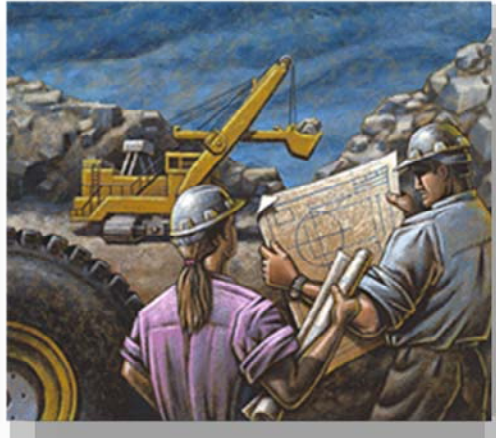
Since our time is short tonight, let's skip to the end.

Let's start into the tools talk, even though I said this talk is not about the tools per se.

But without the tools, the processes become hard to deploy and the people start looking somewhere else for solutions.

Remember tools are the glue that connects people with the process.

Requirements Management Tools



“Developing precise and accurate requirements is a crucial step in the success of a development project or new business process.”

— Visual Studio 2008 Extensibility Site

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First is our requirements management tools.

Actually first was the capabilities management tools, but that topic is outside our interest tonight.

The development of system capabilities is business side function in IT and a Systems Engineering function in other domain.

But capabilities are easy in certain ways. Here’s an example. The “owner” of the Hubble Space Telescope – Frank Ceponilla – had three capabilities he needed for a robotic servicing mission

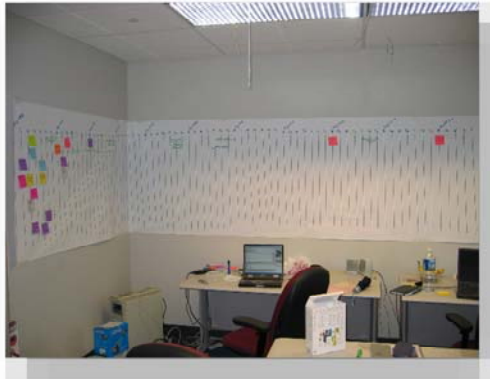
1. Do no harm to Hubble
2. Replace the Wide Field Camera – it was busted
3. Connect an umbilical cord to the batteries to extend their life

How much does that cost? And when can you have the solution ready.

Now there were 1,000’s of requirements that came from those 3 simple capabilities. But without the capabilities being stated first, each requirement had no reason for being there.

So requirements tools are needed to keep track of why and what questions for the project.

Schedule Management Tools



A Schedule is NOT a Plan

A Plan is the strategy for the successful completion of the project;
The *Schedule* is the description of the work to produce that success.

Both *Plans* and *Schedules* are needed!

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Once we have the requirements in some form we need to answer the HOW and WHEN questions. This is the purpose of the schedule.

But this schedule needs to possess certain attributes to be of any use to the project in forecasting the future.

This forecasting process is what schedules are actually about. They are useful for determining what should happen in the future. But their real value is to reveal where there are trouble spots that are not visible in the static description of the linked work.

I'll show you how to use a Monte Carlo Simulation (MCS) tool in later slides. This tool provides information about the schedule that can not be determined with a static structure.

Cost Management Tools



Time is NOT Money

Money can be preserved, Time is lost starting the 1st Day of the Project

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HOW MUCH is another question that needs to be answered.

Connecting cost and schedule is the minimal acceptable process of any credible project management process.

But this effort always starts with the schedule. So when we says “cost and schedule,” we really mean “schedule and cost.”

Risk Management Tools



“Risk Management is How Adults Manage Projects”
— Tim Lister

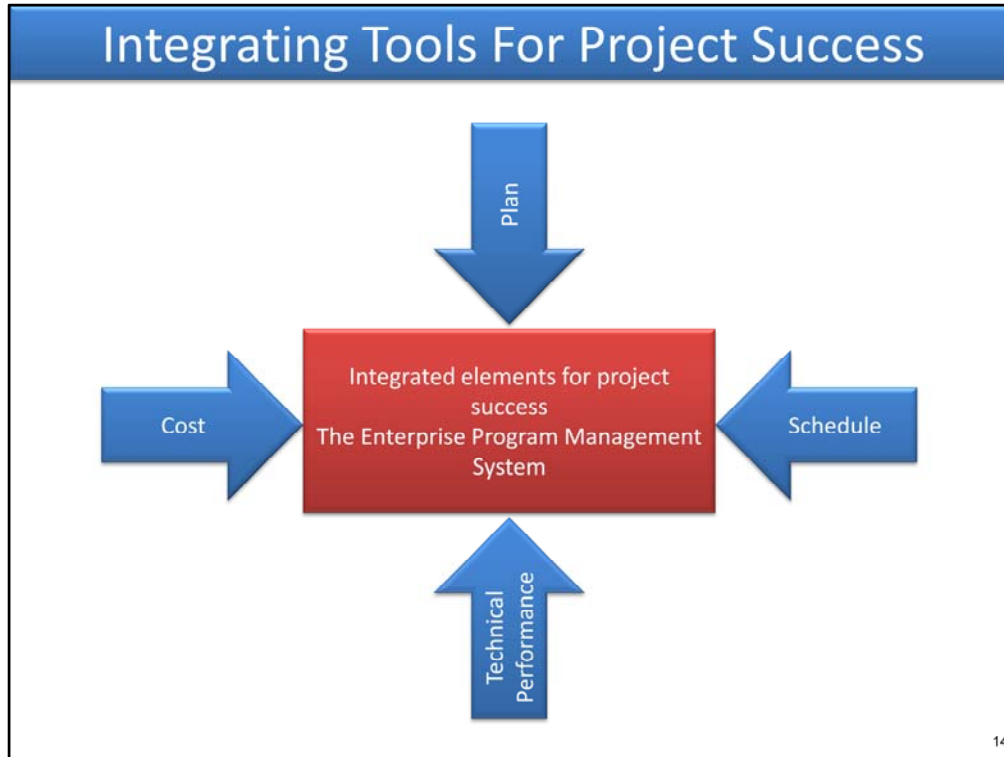
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One question that not frequently answered correctly in IT projects is “what are the impediments to the success of my plan?”

What are the risks, how can they be handled, and what does it cost to handle them in terms of time and money?

We need a risk management tool. Actually we needed several of them. One manages the lists of risk, the inventory of risks, who’s looking after them. Another tool models how these risks impact the cost and schedule.

Remember this phrase – risk management is how adults manage projects. It may be crass, but it’s true.



These four tools areas need to come together in one place for them to be effective.

They can be separated, but it is better for the project if they're integrated.

Now this integration can take many forms. Project Server is one form. Separate tools integrated "on the glass" is another.

But before any integration of the tools takes place, the work processes for managing the project needs to be in place. Only then should tools be added to the process flow.

If you start with the tools, the needed capabilities of the project – the business process capabilities are locked. And making changes to them becomes more difficult.

Wait as long as you can before deploying a tool. Any increases in the probability of project success comes from the process side, not the tools side. Remember tools are the glue between people and processes. Glue alone adds little value, other than spend money for the tools and raise everyone's hope that the project probability of success will increase.

How to Produce Value by Integrating Tools with the People and the Processes



- A Defined Set Of Business Capabilities
- A Structured Requirements Flow Down Tree
- A Well Defined Work Breakdown Structure
- Clear And Concise Descriptions Of Deliverables
- Work Packages To Produce These Deliverables
- Measures Of Physical Percent Complete
- Continuous Risk Management At Every Step
- An Integrated Digital Environment
- Training To Recognize What "Done" Looks Like
- The Will To Make All This Happen

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Being integrated is necessary but not sufficient. The integration needs to produce value for the project.

Here's a list of value statements we should look for when we say "we have an integrated project management system based on tools."

Before We Move On To Some Solutions, There Are Some Questions We Need To Answer

- Do we know what the customer wants?
- How much will it cost when it is done?
- When will we be done?
- What stands in our way to reaching done?
- Who works on what parts of the solution?
- Can we speak about our progress in units of measure meaningful to the customer?

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Let's revisit some questions we want our tools to help us answer.

The tool itself doesn't provide the answer. People provide the answer. The tool provide the data and the information that provides the answer.

- Do we know what the customer wants? Capabilities and requirements are good ways to answer that. Descriptions of the work needed to produce the requirements are next.
- How much will it cost to do this work?
- When will this work be done? This is the role of the Plan and Schedule.
- What are the impediments to progress – a risk management tool helps here.
- Can we talk to the customer in units of measurement meaningful to them? Physical Percent Complete is a good unit of measure.

To Reach Done We MUST Know What Done Looks Like

The Way To Describe DONE is to build a WBS that:

- Is product or services oriented
- Includes all work in the project
- Logically aggregates each element of the product and those elements below it
- Reflects the manner in which the work will be done

The WBS becomes the framework for Cost, Schedule, and Technical Performance Measurement.

The WBS is the organizational structure for the Work Packages

This sounds simple at best and possibly lame at worst. But without a description of what the project is delivering, you might as well not even start. You'll just be wasting everyone's time and money.

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Now this is a real snoozer topic – work breakdown structures. For some there could not be a fate worse – be in charge of the work breakdown structure.

I'll say this with as much emphasis as possible. You don't have a work breakdown structure in some form – you don't have a project.

I came here tonight from a client site where the WBS is noncompliant with the DoD requirements stated in ANSI-748B. Now for small IT projects that may not mean anything. But a billion dollar development program, not having a compliant description of what work is being done, by whom, with what resulting product is a big problem.

I can't emphasize enough that the project starts with the WBS.

From the WBS all other project attributes follow. No WBS no project plan.

If your executing a project without a credible WBS you're wasting money. If it's your money shame on you. If it's someone else's money shame on them for letting you spend it without a WBS.

This may sound harsh, but in the end someone, somewhere is going to ask – “what will it get for my money?” The WBS tells you that.

Building The WBS In MSFT Project

- Don't use the WBS field, it wants to do things its way, use a custom TEXT field
- Build the WBS in a logical manner with a tool that support hierarchical decomposition – MindJet®
- The WBS is derived from the requirements, not from the functions that implement the requirements
- The WBS states in unequivocal terms what “done” looks like – *when all the deliverables are delivered we're done*

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But more important, the WBS and the associated WBS dictionary tells you what done looks like.

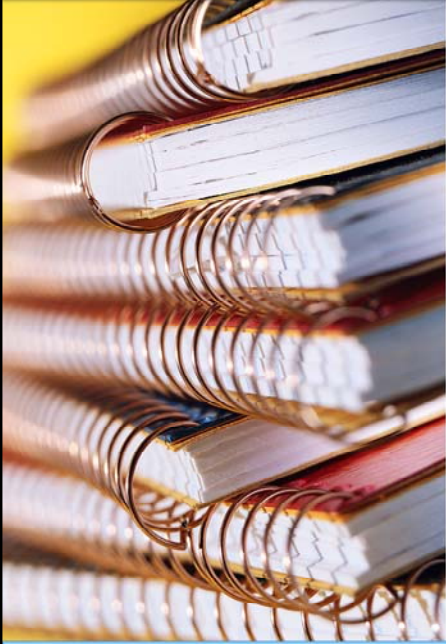
And knowing what done looks like is what project management and project management tools are all about.

So let's look at a really good tool for building a WBS.

No it's not MSFT project, it's MindJet's Mind Manager. You may not have heard of MindManager, but you probably have done “mind mapping” before.

It's what you do when you draw pictures of how things are related. In this case related through the hierarchy– a Work Breakdown Structure is a hierarchal description of what done looks like.

Guidelines For Building A “Good” WBS



- The 100% rule – all work in the WBS
- Mutually exclusive elements – no overlapping scope – a pure hierarchy tree
- Planned outcomes, not planned actions – define the deliverables and their components
- Levels of detail
 - The 80-hour rule for each end item
 - Work should cross only one accounting period

How long are you willing to wait before you find out you're late?

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But first what is a good WBS.

Here's some guidance.

This some obvious, but building a WBS, a good WBS is hard work. We're on a 7 week engagement to rebuild a WBS for a multi million dollar software project. It is hard work.

These guidelines help us every day.

Remember though the WBS is a cost analysis tool. From the WBS we need to construct the Time Analysis – the schedule.

Both are needed. And a third description – the Technical Performance Measures are needed too, but that's outside tonight's talk.

Using MindManager® To Build The WBS

- Capture the contents of this “Map” in the Product Development Kaizen
- Focus on the “product” decomposition not the functional decomposition
- This is an iterative and incremental process
- Have the stakeholders in the room
- Connect the WBS with the “needed business capabilities” by asking *why do we have this product element here?*

www.mindjet.com

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Here’s a screen shot of MindManager. It’s a simple tool to use.

It has one powerful feature beyond making these kinds of pictures.

It can export (and import) this hierarchy to MSFT Project.

This is a visual way of building the WBS used in Product Development Kaizen shops. This avoids committing to project before the visual impact of the WBS can be seen.

In the tree form, the participants can move things around with ease. The Kaizen approach moves the ownership of the product to a public place, removing the personal connection.

Do this for awhile, until you’re sure you want to move to project.

The Output Of MindManager®

WBS	Task Name
1	PRIME WBS
1.1	Aircraft
1.1.1	Airframe
1.1.2	Propulsion (SK-PW-52D)
1.1.3	Communications / Identification
1.1.3.1	Radio System
1.1.3.2	Data Link
1.1.3.3	Communications Systems SW
1.1.4	Navigation And Guidance
1.1.5	Fire Control
1.1.5.1	Radar
1.1.5.1.1	Receiver
1.1.5.1.2	Transmitter
1.1.5.1.3	Antenna
1.1.5.1.4	Radar Applications SW (To CSCI Level)
1.1.5.1.5	Radar Integration Assembly, Test, And Checkout
1.1.6	Central Computer
1.1.7	Electronic Warfare
1.1.8	Armaments
1.2	System Test And Evaluation
1.2.1	Development Test And Evaluation (DTE)
1.2.2	Operational Test And Evaluation
1.2.3	System Mockups
1.2.4	Test And Evaluation Support
1.2.5	Test Facilities
1.3	System Engineering / Program Management

- The MSFT Project WBS can be derived directly from the Mind Map structure with a mouse click
- This example uses the WBS field, but that's discouraged
- Use a text field and a template

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Here's the schedule produced with a mouse click from MindManager to Project.

Now this sounds simple. Too simple. Why do this.

Well, what if you have 50 elements in your WBS. no problem do it in what ever tool you want.

What if you have 5,000 elements in your WBS. Well now that's a different problem.

What's In A Name? The WBS Dictionary

WBS Dictionary as of Thu 4/11/02
RunLibTdal

WBS	Name	Cost
"Hybrids" continued		
<u>Notes</u>		
1. 4 5VX4 chips.		
2. miscellaneous components (capacitors, resistors, thermistor).		
Runs (4 chips hybrids):		
1. Prototype#1 (milestone #1 "electrical stove test")		
2. Prototype#2-Contingency (milestone #2 "contingency electrical stove test")		
3. Preproduction (milestone #3 "preproduction electrical stove test")		
4. Production (milestone #4 "Production electrical stove test")		
Need 1,080 4-chips hybrids and 72 2-chips hybrid for the project.		
1.1.1.2.1	Outer layers	\$1,752,946
<u>Notes</u>		
Runs (4 chips hybrids):		
1. Prototype (milestone #1 "prototype electrical stove test"), Proto#1 chip		
2. Contingency (milestone #2 "contingency electrical stove test"), Proto#2 chip		
3. Preproduction (milestone #3 "preproduction electrical stove test"), Production chips		
4. Production (milestone #4 "Production electrical stove test"), Production chips		
Need 1,080 hybrids		
1.1.1.2.2	Layer 0	\$285,592
<u>Notes</u>		
Runs:		
1. Prototype		
2. Production		
Need 72 2-chips hybrids.		
1.1.1.3	Bus Cables	\$61,502
<u>Notes</u>		
Outer layer Bus cable is a Kapton based cable with signal and power traces to electrically connect the mini-PC to the pick-up from the sensors and the sensor bias connection.		
Runs:		
1. Prototype (milestone #1 "electrical stove test")		
2. Preproduction (milestone #3 "Preproduction electrical stove test")		
3. Production (milestone #4 "Production electrical stove test")		
Need 360 bus cables for the project.		
Labor:		
All LBL labor. No FNAL efforts for the Bus Cable		

- The WBS dictionary is the guide to "Done"
- It states what the evidence is for the product or service
- Enter this information into the Notes field for each project activity
- Print this report for the WBS Dictionary
- Use this to assess what is being delivered

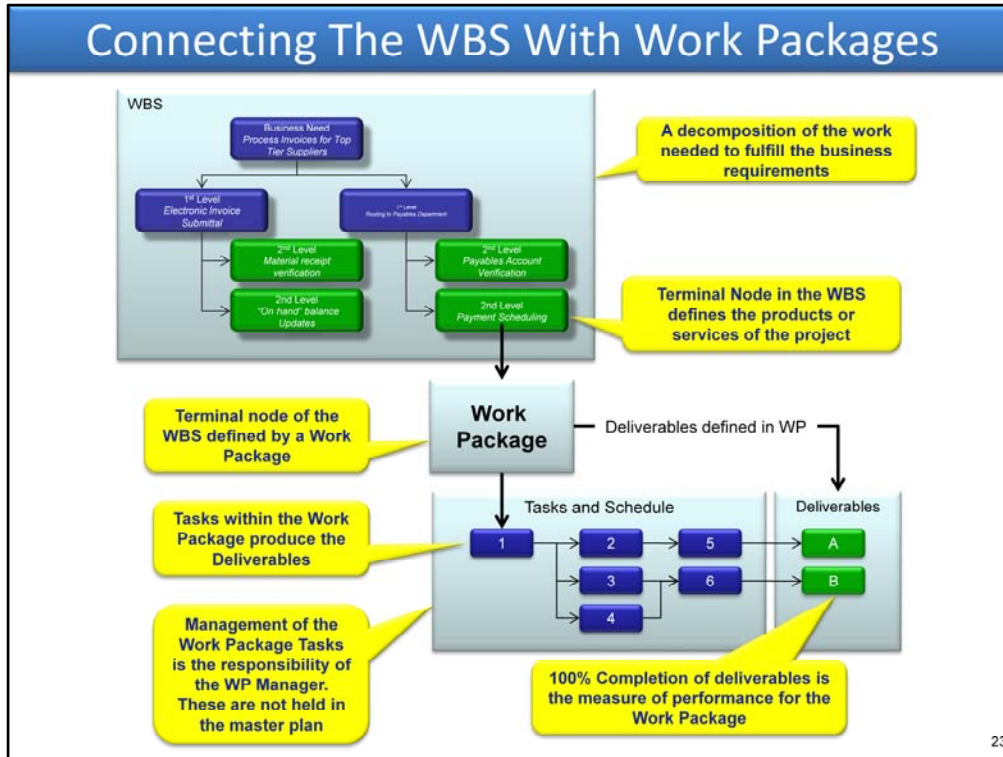
I mentioned before the WBS Dictionary.

This is the narrative of what done looks like. This is done in MSFT project or in MindManager. Your choice

But the WBS Dictionary is the core of connecting the Plan and Schedule, with the Requirements and the system Capabilities.

In this example the Dictionary uses the somewhat limited formatting of Project's Notes field.

This is fine, it's meant to have content, not necessarily style.



Now let's put all this together.

Starting with the WBS, the terminal nodes are represented in project with Work Packages.

This may not be a term you've heard of before. A Work Package is a lump of work that produces a single outcome. A "package of work" that produces something.

For the schedule putting the Work Packages in the proper order is the starting point for a credible schedule. If you can get the Work Packages in the right order, with their durations defined, then you have the start of the credible schedule.

The next step is to not do any more scheduling in MSFT project. Instead let the Work Package manager look have the activities inside the Work Package and be done with it.

This is how large Defense and Space programs schedule. There are three levels of schedules mandated by a government "rule," DID 81650.

The Master schedule – a top level "picture" what is happening in what order

The Intermediate Schedule – the sequence of Work Packages

The Detailed Schedule – the day to day activities of the project.

For IT projects, the Intermediate schedule is a sweet spot. One that connects cost with work and deliverables. One that minimally imposes effort on the team and fits well with the agile world of Corporate IT software development.

Building A Credible Schedule

- What are the units of measure for “Credible?”
- “What does DONE look like?”

The schedule is the description of the work needed to produce value to the Stakeholder

- The schedule must be a logical flow of the increasing value produced by the work effort
- The durations must have statistical measures associated with the static durations
- The “reader” must be able to recognize how the “value flow” is constructed

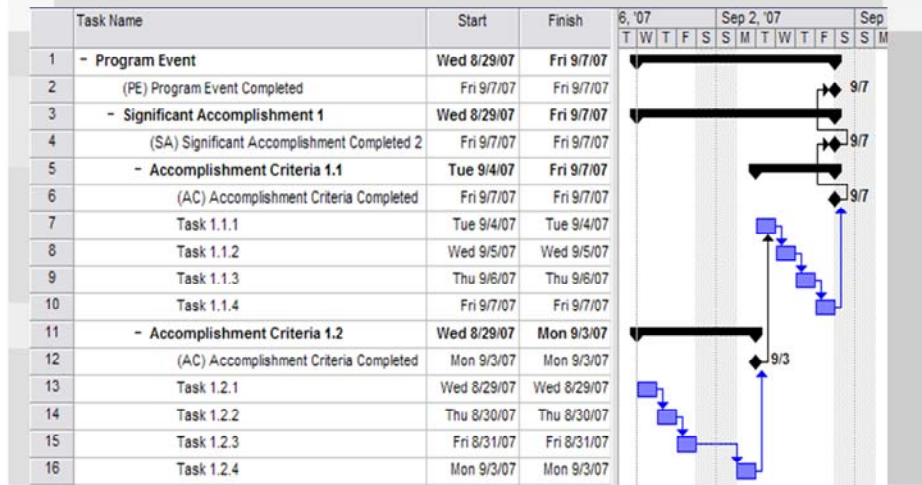
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To restate the importance of the schedule again, let's look at it from another point of view.

A credible schedule is one that describes the work to be done, the order of that work, the measures of maturity as the schedule moves from left to right.

The units of measure of credibility are not always obvious. But a starting point could be that the schedule is “believable”

It's The Not Work Effort We're After It's "What Does Done Look Like?"



The schedule must speak in units of measure meaningful to the stakeholders – business value and physical percent complete

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The schedule should show you want done looks like. Not just the work effort.

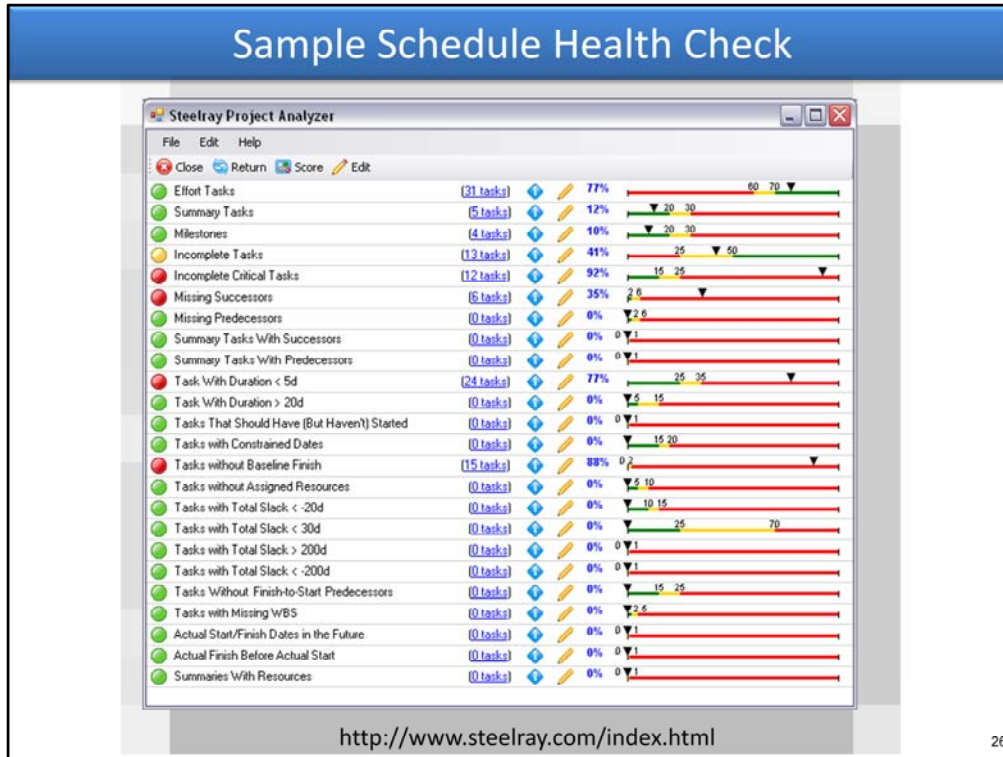
“Done” needs to be measured in terms of physical percent complete, not the passage of time and consumption of resources.

Getting the schedule to tell you what done looks like is hard work. And beyond this limited time.

On our programs creating, maintaining, reporting, updating the schedule to make sure it is Credible is a full time job. Sometimes a full time job for dozens of people are large programs.

If you're spending other people's money it's actually your obligation to build a credible Plan and associated Schedule that sows “done” in units of measure meaningful to the buyer.

Sample Schedule Health Check

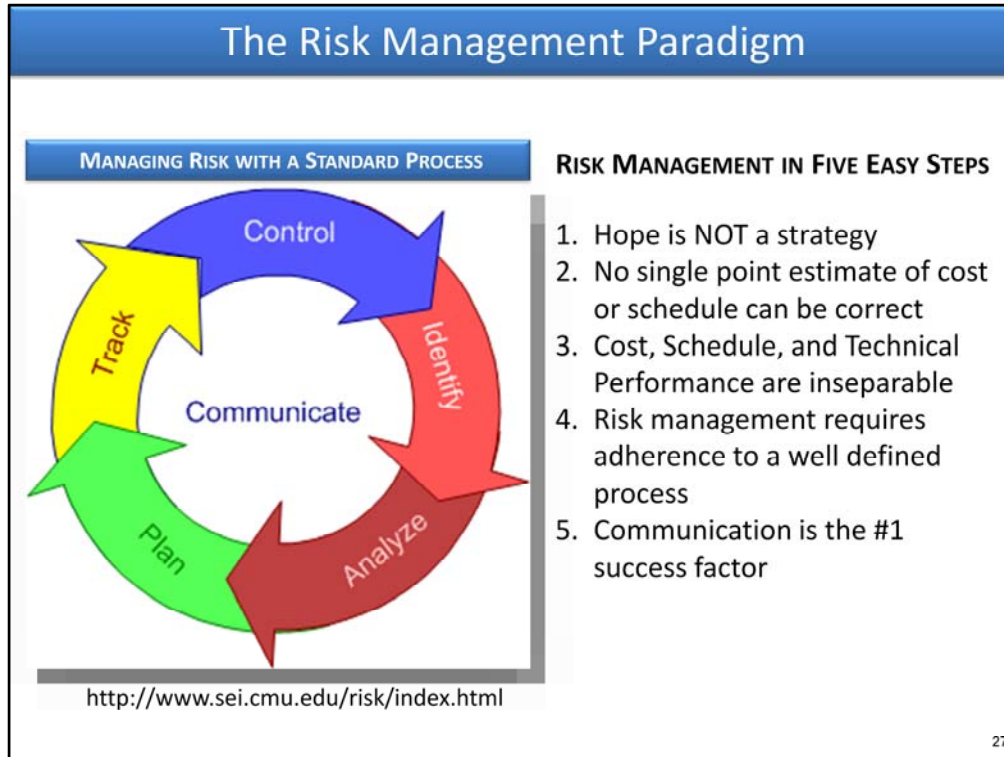


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You can buy SteelRay or you can build the analysis from SteelRay your self.

Either way you must know things about the schedule in order to answer the question – “is this schedule credible?”

The point of these tools – and there are others than SteelRay – is to have a consistent assessment of a project “health.” to not rely on personal opinion. To guide the development of good schedules.



There are several risk management paradigms. This one belongs to the Software Engineering Institute. The Continuous Risk Management process.

Another paradigm is the Department of Defense Risk Management Guidebook.

These two approaches provide essentially the same framework. One place is the Project Management Institute's Guide to the Project Management Body of Knowledge®.

Another is the Software Engineering Institute's Continuous Risk Management process.

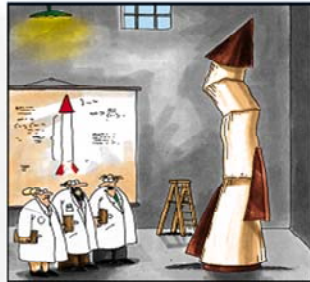
I'd recommend the SEI CRM for its completeness.

But along the way remember there are five easy piece of risk management.

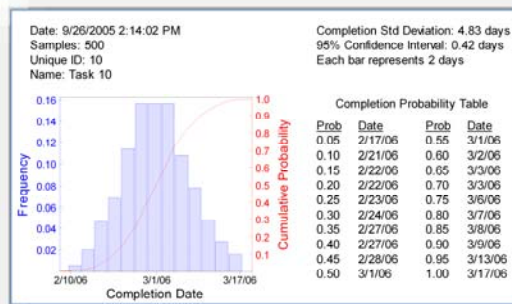
1. Hope is not a strategy. Only actionable outcomes
2. All measurements are measures of random variables. You must know the underlying statistics and variances of those statistics
3. Never forget cost, schedule, and technical performance are inseparable. Change one, the others change too, in some way.
4. You have to follow a know risk management process. SEI is good, so is the DoD process. PMI is OK. It's better than nothing
5. If no one knows your looking after the risks, than you're wasting your time. Communicate risks!!

Two Types Of Project Risk

- **Technical Risk**
 - The risk that the project will fail to meet its performance criteria
 - Hardware and software failures
 - Requirements failures
- **Programmatic Risk**
 - Cost overruns
 - The project will exceed its planned budget
 - Schedule overruns
 - The project will exceed its planned completion date



So much for our strategy of winning through technical dominance



Risk+ is at: www.delttek.com

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The risk management processes needed for a credible schedule come in two flavors.

1. Technical risk – the risk that the technical behaviors do not meet the expected outcomes.
2. Programmatic risk – the risk that the project will be over budget and behind schedule.

The technical risks need to be identified in a risk management tool and have mitigation or retirement activities embedded in the schedule. The reason they need to be embedded is:

- The risk and its mitigations must be visible
- Funding and resources must be committed for risk handling
- The impact of the risk on downstream activities must be assessable. The only way to do this is to have the risk handling work in line with the delivery work

The Risk Register

- This tool is **free**, approved by DoD, and used on highly visible, mission critical programs, and comes with a manual
- But commitment is mandatory to maintain content and make decision on this content

	A	B	F	G	H	J	K	O	P	U
	Risk No.	Related Risk	RISK	Timeframe Start	Timeframe End	I	Po (%)	Borda Rank	R	Manage/Mitigate
1	1	4	IF contract is not awarded before 30 Sep, THEN program loses \$8M in expiring funds.	30 Jan 1999	30 Sep 1999	C	60%	0	H	Use existing Task Order contract to assure award before 30 Sep.
2	2	N/A	IF unmodified commercial laptops are used, THEN operational availability cannot be met in intended environment.	28 Feb 1999	28 Feb 2000	S	100%	0	H	Limit buy for first release and plan technology insertion for improved environmental performance for second release.
3	3	4	IF DII COE V1.5 is more than 1 mo. late, THEN first release will slip day for day.	30 Jan 1999	30 Oct 1999	S	90%	3	M	Use DII COE V1.4 for first release and modify requirements.
4	4	1,3	IF first release is not demonstrated in EFX, THEN program will be assigned to Navy.	15 Feb 1999	15 Apr 2000	C	60%	0	H	Integrate only those capabilities available at contract award for first release.
5	5	1	IF all KPPs must be satisfied by second release, THEN program funding is insufficient.	30 Jan 1999	30 Jul 2001	S	40%	4	M	Use CAV to prioritize release content subject to budget and plan for third and fourth release.

<http://www.mitre.org/work/sepo/toolkits/risk/index.html>

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The first risk management tool is free and runs in Excel.

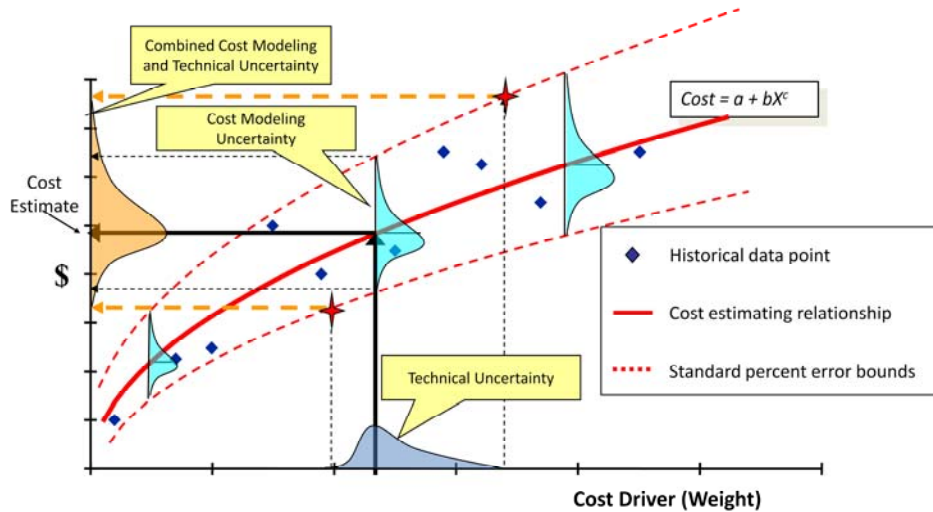
It's the risk register. This is where the risks are held while they are being processed according to the SEI Continuous Risk Management process.

This tool can be downloaded from the web site along with a manual.

Doing risk management is a skill. It is not about making lists and checking them twice. It's about actually managing the risk in the same way you manage work.

Monte Carlo Simulation (Crystal Ball) Of Cost

- The same simulation approach is taken for cost analysis
- Cost Risk, Schedule Risk, and Technical Risk are inseparable
- Managing in the absence of this understanding means, *Hope Is Your Strategy*

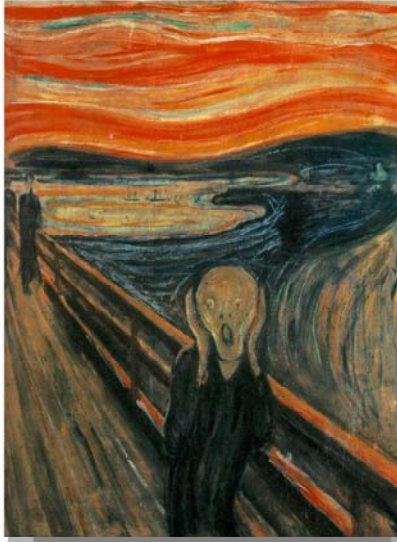


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The Monte Carlo Simulation tool can be used for cost modeling as well.

Cost modeling is a second order activity on many IT projects. Since they are focused on writing software and planning to write software. Much of the cost on internal IT is touch labor. Because of this the cost projects are really absorbed labor projections.

Resource Levelled Schedule?



- Automatic resource leveling individual tasks is usually a waste of time and effort
- Resource *allocation* at the Work Package level is where the value is
- Let the Work Package manager assign, allocate, and manage these resources within the Work Packages
- Use this resource *allocation* as the basis of the labor spreads
- The WP Manager keeps these balanced by looking at the labor spreads in the Resource View

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The concept of resource loading is often confused with resource leveling.

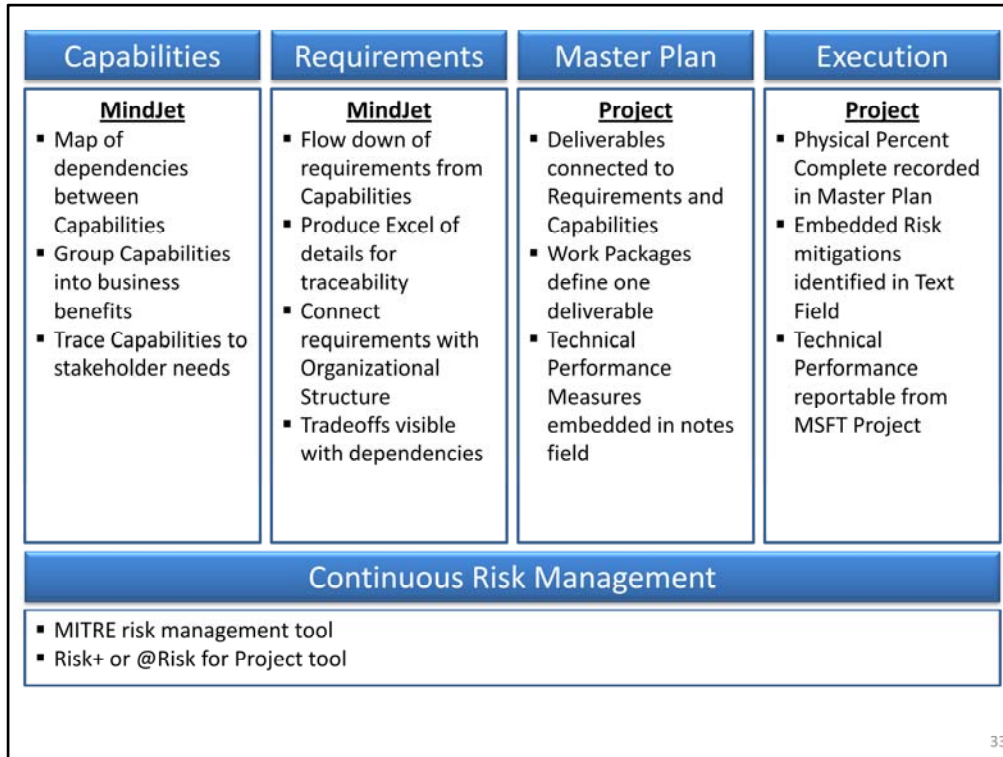
The management of resources many times starts with the wrong paradigm. That paradigm is “what can we do with the resources we’ve got?”

Rather, you ask “what resources does the project need, and when do I need them?” If you take the first approach, you’ll always be behind on the resource curve. Using the first approach we can know on day one what the resource requirements are. It’s slowly becoming clear that multitasking is a Bad Idea. So bad in fact, that project failure can be directly attributed to the failure to manage resources.

So the first thing to do in MSFT Project is to turn off the resource leveling functions.

Instead start with these steps:

- Identify, using subject matter experts, what resources are needed for the work to be performed.
- For each work package, identify how much of a specific resource is needed.
- Do not multi-task resources. Everyone knows this. Everyone does this. If you do it, you’re setting yourself up for disappointment. Multitasks between two projects is difficult. It can be done, but it’s difficult. Multitasking between more than two projects leads to failure. So don’t do it.



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So let's take a quick summary of where we are.

We've got five process areas in every project. I've introduced some tools that can be used for each of these process areas.

What's next is to look at some examples of how these tools can be applied to the process areas and what some of the results look like.

Ok, It Is About Tools After All ... Sort Of



- But only after you've established all the business and programmatic processes
- Then and **ONLY THEN** can the tools provide value to the organization

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But let's remind ourselves before moving on – it's not about the tools, it's not about the tools, it's not about the tools.

The Starting Point for Building a Credible Schedule in MSFT Project

Work Description	Work Arrangements
<ul style="list-style-type: none"> ▪ Work Packages derived from WBS and Deliverables, never bottom up ▪ All work contained in schedule produces outcomes. Never build a functional schedule (design, code, test) ▪ Work Packages are linked through connection tasks, that represent the intermediate outputs ▪ Activities inside Work Packages describe end to end work for the deliverable ▪ Zero duration tasks represent the deliverables ▪ All work “trees up” to deliverables ▪ Measures of progress focused on deliverables, not the passage of time 	<ul style="list-style-type: none"> ▪ Finish to Start relationships are the vast majority of the work ▪ All constraints are AS SOON AS POSSIBLE (ASAP) ▪ Task durations are approximate as a start, know the variances ▪ Duration margin is EXPLICIT in the schedule NEVER buried in the duration estimates ▪ No widows or orphans in the schedule ▪ All work flows to deliverables ▪ Resources are “assigned” inside the Work Packages and balanced by hand through the Resource Usage view

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Starting with the schedule, since we're here at the Microsoft Project Users Groups meeting.

We need a Work Breakdown Structure as the starting point. Without the WBS we can't what it is we're supposed to be building. The WBS must be product oriented. No Design, Code, Test type of WBS. That is not allowed in MIL-STD-881A projects – the WBS Standard.

If should not be allowed in IT projects.

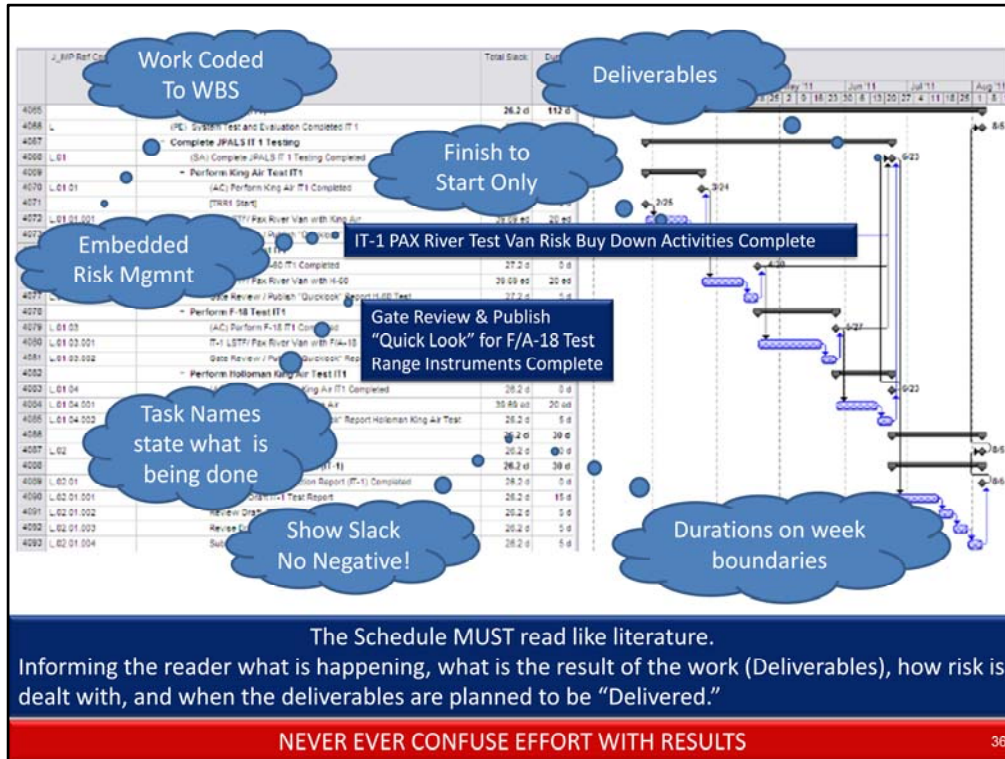
It's bad project management practice.

From the WBS a collection of Work Packages can be built. These Work Packages should be self contained, produce one – or a very small number of deliverables, and resource balanced by the Work Package owner in conjunction with other Work Package owners.

Arranging the Work Package in a logical order is next. This should be Finish to Start (FS) in every case where it is possible. Don't get lazy here, do the work needed to arrange the FS relationships.

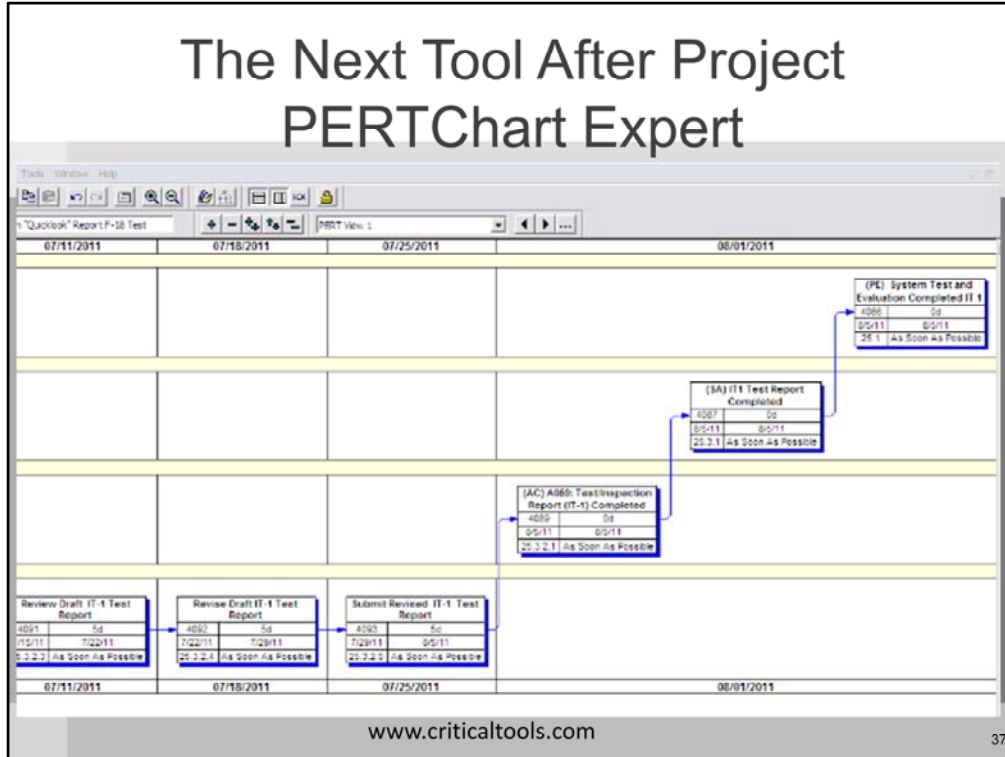
If it doesn't work that way for the majority of Work Packages, you've probability got the wrong Work Packages.

They are too “coupled.” The measurement of coupling and cohesion, is a standard Object Oriented Software Development team. The same is applicable to programs with work efforts.



Here's a sample from a real project with embedded risk management, embedded project margin and a deliverables focus.

The Next Tool After Project PERTChart Expert



The PERTChart Expert tool provides a view of the project not available through MSFT Project.

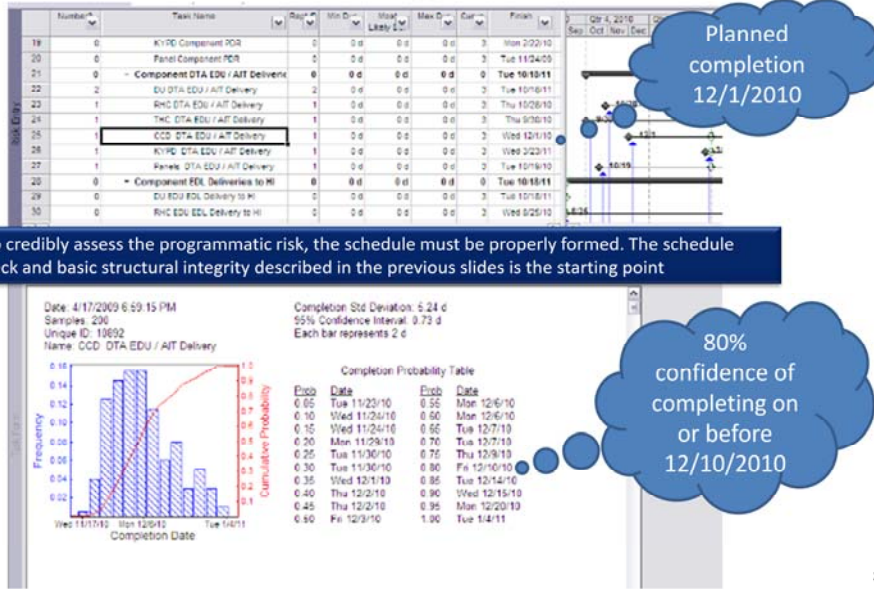
Each “band” can represent any sort field on MSFT Project. So the view can be tailored to the needs to the project.

This bands could be People, Roles, Technologies, Method Phases.

The boxes are the tasks in the project schedule, and they move left to right in time and dependencies.

Any updates to this file are reflected directly in the MSFT Project MPP file. So bi-directional linkage is possible.

The Next Tool Is a Monte Carlo Simulator for Programmatic Risk

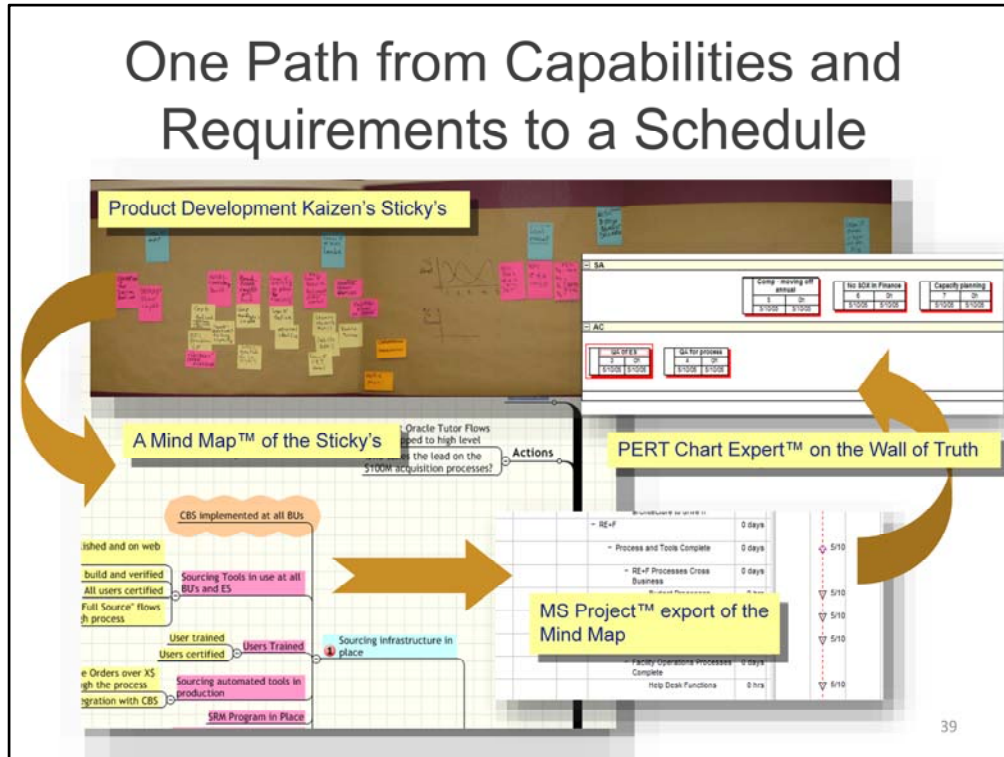


The use of Monte Carlo Simulation (MCS) is mandated in many project domains.

This is a powerful tool to reveal the statistical behavior of the project under varying programmatic risk conditions. The Monte Carlo simulator assesses the schedule by changing the durations of tasks using values drawn from a probability distribution for each task. It evaluates the resulting changes in the completion dates and records those for a large number of cycles – 1,000's.

The tool then builds a histogram of these completion dates and shows the probability of completing “on or before” a specific date, from the results samples of all completion times.

One Path from Capabilities and Requirements to a Schedule



Here's a picture of actual output from tools for a major ERP systems integration program.

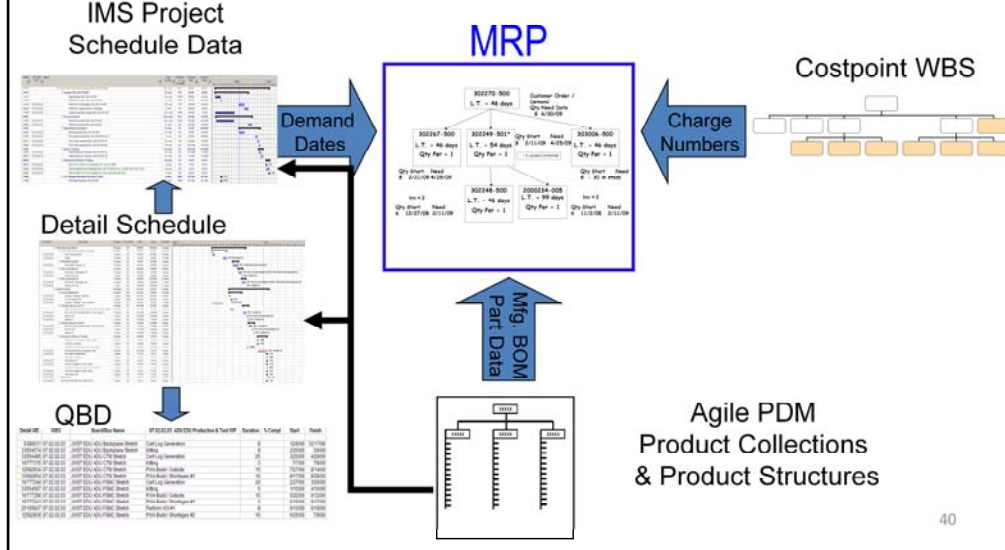
Starting in the upper left, the needed capabilities are captured through a Product Development Kaizen with the stakeholders in an offsite session. These Kaizens are full contact meetings where the participants work "on the wall" to reveal the capabilities and the attributes of these capabilities.

Using MindManager the relationships between the capabilities and the accomplishments and criteria for their assessment are assembled into a Work Breakdown Structure.

From the WBS an Integrated Master Schedule is built describing the work needed to cause the capabilities to appear.

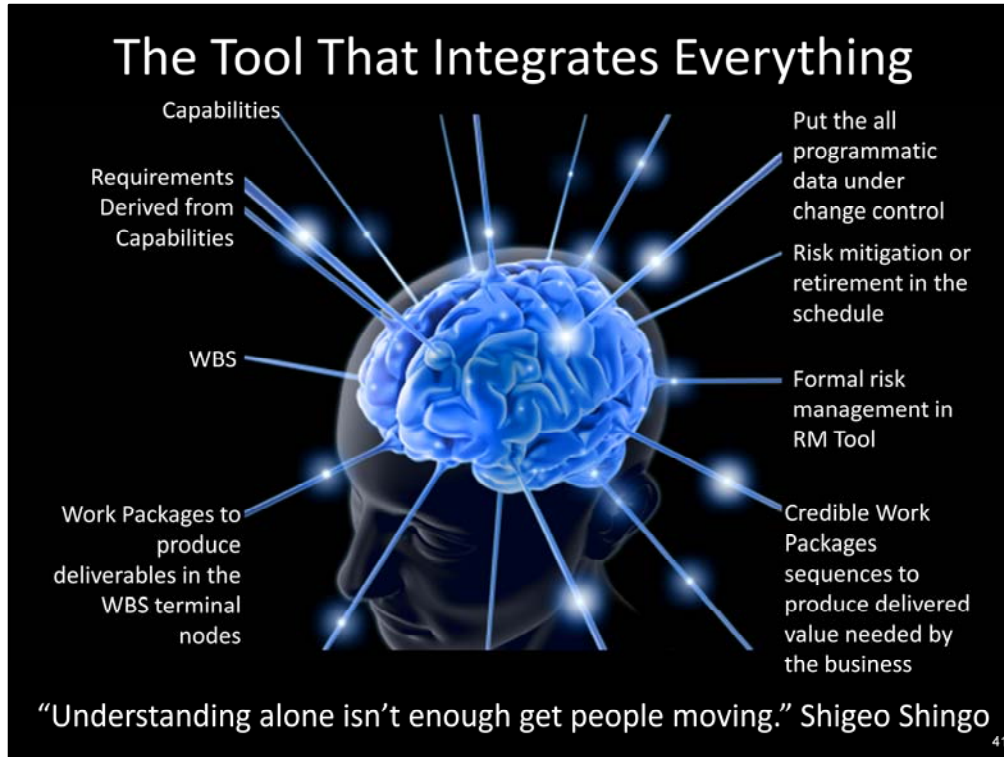
A Master PERT showing the flow of increasing maturity and the Value Stream for the IT work. This closes the loop from "need" to "delivery."

And Another Approach Where Cost is the Driver Rather Than Requirements



Here's another example of how tools can be integrated to manage a program using the guidance of Capabilities, Requirements, Performance Baseline, and Execution.

In this example the evidence of Physical Percent Complete is held in the Quantifiable Backup Data worksheet in the lower left corner. This information is defined during the development of the Work Packages and used to assess the physical progress of those Work Packages.



All these tools and their interactions with the processes and the people needs to be put in perspective.

While tools and processes are critically important, having the right people in the right “seats on the bus” as Jim Collins would say in “Good to Great,” is as critical. These people must have a deep understanding of how to put the tools to work on their behave or the tools are of little value to the organization.

We’ve seen this many times, where a program management or technical groups purchased a tool as the solution to their problems. Only to discover they did not understand the problem, so the tool had no chance of success.

Input	Tool	Outcome
Capabilities Identification	Requirements Management	Connection between requirements and business value
Requirements Management	Requirements Management	Connection between requirements and planned work
Work Breakdown Structure	Microsoft Project Or Project Server	Traceable costs to deliverables
Deliverables		Measures of Physical Percent Complete
Work Packages of Deliverables		Allocated effort and measures of progress
Risk Mitigation Plans		In line description of risk retirement plans
Cost spreads for Work Packages		Align cost and schedule with deliverables
Risk Identification and Management	MITRE Risk Management Tool	Connection between risk and mitigation efforts

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A final wrap up is needed, just to remind ourselves how the tools are connected to the processes.

We talked enough about why tools are important. But remember the tool is “glue” connecting processes with people.

We can see here the MSFT Project Server is a core component of the tool set for Increasing the Probability of Success. As well tools that augment Project Server are needed.

Risk management and Requirements management are two other processes requiring tools.