

# Resource Management: Where enterprise project management systems fails

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*As Product Development organizations rush to board the enterprise project management bandwagon, they dream of reaching the Holy Grail: operational excellence and business growth. But what more and more companies have found recently is that they are in for a rough ride that typically does not reach its promised destination. This article includes a Motorola case study that will explore why enterprise project management systems have failed to deliver portfolio achievability through effective resource planning and management.*



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Project management and the discipline of good project planning have brought significant benefits to Product Development for many years now. Managing critical paths, coordinating key integration points, and developing contingencies to deal with the risk and uncertainty inherent in Product Development projects have helped to reduce cycle times and improve quality.

But, by their nature, Product Development organizations do not execute projects in isolation nor do they typically dedicate resources to single projects. Product Development environments are characterized by multiple projects being executed simultaneously, using a limited supply of resources (human and physical). What we really have is a portfolio of projects; the challenge is to design a portfolio that is achievable and produces the expected results. Effective resource planning tools and methods are the key enablers for designing an achievable portfolio.

Over the last few years many organizations have turned to enterprise project management systems to meet this challenge. On the surface, this seems to be a plausible approach. Using currently available project management tools, organizations can or already do assign resources to tasks in project plans. If the project plans are then rolled up at an enterprise level, organizations should be able to see the resource load to a capacity ratio and then manage the resources to ensure portfolio achievability. But it's easier said than done. The implementation of enterprise project management systems has been difficult, painful, and costly; and, in the end, most organizations have failed to attain effective resource planning and management. Portfolios are still unachievable and results are not meeting expectations.

## Why it's not working

There are inherent differences between the project plan, which is used primarily to manage project schedule and the resource plan, which is needed to manage organization resources. The key reasons that enterprise project management systems fail to provide effective resource planning can be summarized as follows.

### 1 - All resource demand not captured

*In most organizations, some work (resource demand) is not captured in project plans.* Enterprise project management systems require project plans from which to derive resource demand data. Small projects, administrative activities (e.g., training, meetings), current engineering, pre- and post-project support all put demands on resources but are often not captured in a project plan. This results in one of two situations.

One situation is that the enterprise system substantially underestimates the total resource demand. The data say the system has excess capacity while resource managers know that their resources are overloaded. The system becomes unbelievable and the implementation fails over time.

Another possibility is that management demands that all the "other" work be represented somehow in the enterprise system. This leads to a tremendous amount of detail, overhead, and upkeep which project and resource managers find to be cumbersome and tedious. Most managers will comply to get by; but, again, the implementation fails over time. Project plans with resource loaded tasks usually do not accurately represent the true profile of resource demand on the project.

### 2 - Inaccurate representations

*The total demand for each resource is usually inaccurate because of the discrete, detailed nature of task-based resource plans*

*in project scheduling systems.* Task work estimates do not include all the time required to be a member of a project: Task switching time, project overhead, and other factors that vary from person to person and project to project must be added to the work effort total. Exhibit 1 on this page illustrates this issue.

*Exhibit 1: Resource Profiles*

	Periods (Week, Month, Quarter ...)					
	1	2	3	4	5	6
Joe (demand profile from scheduling tool)	.14	.19	.40	.57	.30	.05
Joe (resource manager's forecast)	.25	.25	.50	.75	.50	.10

*Source: The author*

*As progress is posted against tasks during project execution, the profile of future demand becomes inaccurate and less reliable.* As task completion dates change, task precedence relationships force a change in the timing of some or all subsequent tasks. This in turn changes the timing of resource demand. Also, as projects encounter issues, resource loading on projects may change. Resources may be added or removed from projects for brief periods of time.

In most cases, the continued use of the project plan for schedule tracking is not dependent on updating the resource estimates. Therefore, neither project managers nor resource managers are willing to take the time to make the forecast resource demand profile "come out right"; they are working for the tool rather than the tool working for them. Thus, the resource demand data becomes out-of-date and inaccurate.

**3 - No true "ownership"**

*Resource managers do not "own" the project schedule plans that capture demand for their resources.* Project managers are responsible for developing and updating the project plan periodically during the Product Development process. Only they and their subproject managers can change task timing, durations, and resource estimates in the project schedule file or database.

Even if they rely on resource managers for resource estimates during initial plan development, it is very difficult to continue getting resource forecasts from all the resource managers who are involved. The result is that resource managers take no ownership of the resource plan, and the resource demand data are of poor quality and questionable usefulness for resource planning at the portfolio level.

**4 - Uniformity not maintained**

*Few, if any, companies can maintain a uniformly high degree of skill and discipline in the use of project scheduling systems.* Project planning is a well-defined, complex professional discipline. Project managers come in all varieties of skill and experience; some are untrained, some are beginners, some who are skilled and experienced move on to other positions. If you know or suspect that some project schedule plans are incomplete and inadequate, you cannot have confidence using the resource demand data for portfolio decisions.

**A proven solution exists**

Today, many companies have concluded that enterprise project management systems are good for managing project schedules and deliverables but are not effective for doing resource planning and management at a portfolio or enterprise level. These companies recognize the need for a separate and distinct resource planning and management process that is tied closely to the portfolio management system and that drives and supports the project management system.

An effective resource planning and management solution includes five key activities, as shown in the Box on this page.

**Capture supply**

Supply is the inventory of resources with its capacity for project work in all time periods. It is based on your organizational chart, down to the numbers of people, their names, specific skill sets (e.g., mechanical engineer, software engineer), and capacity.

**Capture demand**

Demand is the work required by current and proposed projects. Project managers prepare a timeline for each project, defining the schedule for various phases (design, development, testing, etc.) and they estimate the type and amount of skills required. The resource managers then identify the resources needed and the work required from each of them by time period. Exhibit 2

on this page shows an example of a resource manager's demand forecast for resource "Cate" to satisfy the resource requirements for several projects. After a project is approved, the resource manager updates the demand forecast periodically. A monthly forecast update might look ahead three to six months. This simple method of capturing what resource managers know about the upcoming use of resources enables project managers and portfolio managers to anticipate and respond to signs of resource problems.

**Exhibit 2: Demand Forecast for Resource "Cate"**

				18.0	0.9	0.9	1.5	1.6	1.4	1.4	1.5
				Row	Jan	Feb	Mar	Apr	May	Jun	Jul
Resource	Requirements	Project Name	Priority	Totals	2007	2007	2007	2007	2007	2007	2007
Cate	VB	Cedar	1	2.56	0.32	0.32	0.32	0.32	0.32	0.32	0.32
Cate	VB	Barbados	10	2.40	0.60	0.60	0.60				
Cate	VB	Coolidge	15	1.60					0.20	0.20	0.20
Cate	VB	Jamaica	17	1.60					0.20	0.20	0.20
Cate	VB	Grant	1000	1.80				0.10	0.10	0.10	0.20
Cate	VB	Birch	9998	8.00			0.60	0.60	0.60	0.60	0.60

**Analyze portfolio resource demand vs. supply**

Analysis begins by aggregating the effort forecasts for each project into a composite picture of all the projects in the portfolio as shown in Exhibit 3 on page 22. (Notice that the projects are sorted in priority order.) The values in the grid are the percent of resource demand that can be delivered to the project in each time period given the project's priority; the row totals are the percent available over all time periods. Highlighting shows where your supply of resources cannot meet demand. This analysis identifies projects that are unachievable as currently planned; it shows when in time and where on the prioritized project list resource supply-demand conflicts will defeat your plans.

		95%	98%	98%	97%	94%	90%	93%	92%	95%	95%	98%	99%	98%
		Row	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Project Name	Priority	Totals	2007	2007	2007	2007	2007	2007	2007	2007	2007	2007	2007	2007
1 Cedar	1	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%			
2 Full PLC Model	1	100%	100%	100%	100%	100%	100%	100%	100%	100%				
3 Pine	1	100%	98%	100%	100%	100%	100%	100%	100%	100%	100%			
4 Barbados	2	98%	100%	99%	99%	95%	94%	96%	97%	100%	100%	100%	100%	100%
5 St Thomas	2	100%						100%	100%	100%	100%	100%	100%	100%
6 Cancun	4	93%	96%				88%	80%	80%	100%	100%			
7 St Croix	4	97%	97%	93%	94%	98%	98%	96%	98%	100%	97%	100%	100%	100%
8 Wilson	4	100%	100%	100%	100%	100%	96%	100%	100%	100%	100%			
9 Coolidge	5	92%		100%	100%	81%	77%	84%	87%	98%	98%	100%	100%	100%
10 Jamaica	7	82%			77%	68%	64%	63%	73%	89%	88%	99%	100%	100%
11 Aruba2	11	99%									95%	100%	100%	100%
12 Antigua	20	85%	73%	100%	87%	72%	56%	76%	85%	92%	96%	96%	100%	100%
13 Fast Track	20	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
14 Oak	28	79%					48%	67%	67%	67%	68%	77%	100%	100%
15 Bahama	32	100%						100%	100%	100%	100%	100%	100%	100%
16 Willow	45	98%					100%	100%	100%	100%	8%			
17 Madison	51	93%							71%	81%	100%	100%	100%	100%
18 Jackson	55	48%					49%	46%	46%	78%				
19 Cozumel	800	100%									100%	100%	100%	100%
20 Grant	1000	91%				93%	68%	100%	81%	94%	88%	100%	100%	100%
21 Maple	1000	33%		80%	80%	88%	48%	6%	13%	33%	33%	100%		
22 Adams	9997	100%						100%	100%	100%	100%	100%	100%	100%
23 Birch	9998	91%						77%	84%	89%	94%	94%	94%	91%

**Exhibit 3: Unachievable Portfolio**

**Make certain decisions**

Decision making is the difficult, but necessary final step to arrive at a portfolio of projects that does not overload your resources and clog your Product Development pipeline. This step must clearly be the responsibility of the senior management team and is integral to arriving at an achievable portfolio. They must be accountable for the portfolio resource analysis view in Exhibit 3 and it is their job to remove the highlighting. The four decisions that can remove highlighting are as follows:

- Cancel the project with highlighting
- Delay the project until it can get the resources it needs
- Change the project's scope so it needs only the resource it can get
- Provide additional resources

The outcome of a successful decision-making effort by senior management is an achievable portfolio of projects as shown in Exhibit 4 on page 23.

Project Name	Priority	Totals	99%	99%	99%	99%	99%	96%	100%	100%	100%	99%	100%	100%	100%
			Row	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1 Cedar	1	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%				
2 Full PLC Model	1	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%				
3 Pine	1	100%	96%	100%	100%	100%	100%	100%	100%	100%	100%				
4 Barbados	2	99%	100%	99%	99%	97%	97%	100%	100%	100%	100%	100%	100%	100%	100%
5 St Thomas	2	100%						100%	100%	100%	100%	100%	100%	100%	100%
6 Cancun	4	96%	96%				80%	100%	100%	100%	100%				
7 St Croix	4	98%	97%	93%	94%	98%	98%	100%	100%	100%	97%	100%	100%	100%	100%
8 Wilson	4	100%	100%	100%	100%	100%	96%	100%	100%	100%	100%				
9 Coolidge	5	98%		100%	100%	97%	89%	100%	100%	100%	98%	100%	100%	100%	100%
10 Jamaica	7	99%			100%	100%	100%	100%	99%	99%	90%	99%	100%	100%	100%
11 Aruba?	11	100%									100%	100%	100%	100%	100%
12 Antigua	20	100%						100%	100%	100%	100%	100%	100%	100%	100%
13 Fast Track	20	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
14 Bahama	32	100%						100%	100%	100%	100%	100%	100%	100%	100%
15 Willow	45	100%					100%	100%	100%	100%	100%				
16 Madison	51	100%						100%	100%	100%	100%	100%	100%	100%	100%
17 Cozumel	800	100%								100%	100%	100%	100%	100%	100%
18 Grant	1000	99%				99%	100%	100%	100%	100%	100%	100%	100%	100%	100%
19 Adams	9997	100%						100%	100%	100%	100%	100%	100%	100%	100%
20 Birch	9998	100%						100%	100%	100%	100%	100%	100%	100%	100%
21 Elm	9999	100%						100%	100%	98%	99%	99%	100%	100%	100%

Exhibit 4: Achievable Portfolio

**Four Key Activities of an Effective Resource Management System**

- Capture supply
- Capture demand
- Analyze portfolio resource demand versus supply
- Make certain decisions

**Motorola-GEMS case study**

The Government and Enterprise Mobility Solutions (GEMS) business unit of Motorola is a multi-billion dollar per year business with 6000 to 8000 resources in locations throughout the world. GEMS has well-defined product and project life cycle management processes that apply to all Product Development projects. Motorola standardized Primavera TeamPlay as their corporate enterprise project management system. All product delivery projects are represented by a project plan in TeamPlay, after initial approval. Projects tend to be large, long, and complex; and TeamPlay is well-suited to handle a large number of such projects.

However, many departmental and nonproduct projects are not represented in TeamPlay. As a result, there was no easy way to assess resource availability for proposed projects. According to Matt Vlasaty, a department manager in GEMS Engineering, "The rolled up resource demand from the project scheduling system is highly inaccurate and extremely difficult to reconcile." As a result, GEMS developed a home-grown resource planning tool (Integrated Resource Management System or IRMS) some years ago to address this problem of forward resource planning and management for new projects.

While IRMS was reasonably successful at gathering and presenting resource planning data, there were many problems with it. Perhaps the most serious according to Brian Pohman, GEMS Program Office Director, was that "Resource managers hated it and its user interface." The GEMS management team wisely pulled together a working group to define requirements for a replacement. The working group included a representative sample of highly experienced and credible mid-level resource managers as well as very capable members of the engineering organization tools support team.

After many months of part-time meetings and work, the team specified a set of requirements for an effective resource planning and management solution. The key requirements were as follows:

- >Accountability: The solution must have clear roles and responsibilities for the key stakeholders in this process - the project managers, the resource managers, and the senior (portfolio) management team. It is especially important to leverage the knowledge of the resource managers and put them at the heart of the resource planning solution.
- Accuracy and Consistency: All resource managers must use the system to enter or validate their resource plans; as standard practice, resource managers forecast resource demand for the upcoming two to six months on a weekly, biweekly, or monthly basis.

- *Timeliness and Flexibility:* An organization-wide resource forecast update must be completed in days rather than weeks (or months). The tools and process must be flexible, easy to use, and designed for resource management. The tool must have low overhead for the resource managers and project managers who supply the data.
- *Actionable analysis:* The tool must provide consolidation and interactive, actionable analysis at the portfolio level.

The GEMS team specified a grid-style data entry and presentation interface with Microsoft™ Excel" type application functionality. But something more than Excel" was needed to get consolidation and actionable analysis of resource supply-demand conflicts in a prioritized project portfolio.

They purchased and deployed a commercially available system designed for resource planning and management. The system allows the resource managers to easily enter and update resource information on a project basis. The project level data is then automatically consolidated and presented in an actionable format at the portfolio level. GEMS trained 300+ managers in a period of about two months from the deployment "go" decision, and held portfolio management team meetings that were based on resource manager data within a few months of the final training sessions.

After several portfolio review meetings, GEMS executive, strategic, and financial management and portfolio, and resource department directors all agreed that they have actionable analysis that is helping them make better and more timely portfolio decisions. One GEMS manager in Europe said, "If I had had this tool and process in December last year, I could have completed the planning exercise in one week instead of the three months it took."

### Better resource management

Enterprise project management systems are not providing the data that managers need to develop and maintain achievable portfolios. Organizations will benefit greatly from a solution that emphasizes the role of the resource manager and provides accurate, consistent, and timely resource information. The right tools enable timely, low overhead-data updates and provide consolidated and actionable reports that can be used to make effective portfolio decisions. The Motorola-GEMS business unit was able to deploy a new resource management system and was using it to make effective portfolio decisions within a four month period. All organizations faced with the universal resource supply-demand problem need to look beyond enterprise project management systems to solutions aimed at the specific requirements and needs of the resource managers; i.e., a simple but powerful solution aimed squarely at portfolio achievability through effective resource planning and management.

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