



An integrated approach to project management

Although project management has evolved significantly over the years, it still falls short in bringing projects in on target and on time. Discover project management solutions that enable organizations to model all their projects and their entire supply chain together in one environment for some compelling benefits.

For many organizations, excellence in project management is fundamental to their success. In some industries like aerospace and defence and construction, projects are what they do – it is how they earn the bulk of their revenue. In other industries like manufacturing, projects are a primary way to achieve competitive advantage, the means by which to create or improve a product, service, system or process.

The practice of project management has matured and evolved a great deal over the past half century and is an established discipline with tremendous resources (such as standards, frameworks, associations, certifications, books, blogs, and conferences). However, it remains a significant challenge to efficiently bring projects in on time, on budget, and delivering expected results. This is particularly true for organizations that manage a portfolio of large, materially-intensive programs and projects.

Many software tools and solutions are available that support Portfolio and Project Management but very few fully model the interdependence between projects and material supply, a key project resource. In addition, most of these applications lack an ability to accurately model and evaluate the impact project schedules have upon capital and cash-flow.

An integrated approach to project management enables an organization to model all their projects and their entire supply chain together in one environment. This is a quantum step forward in the evolution of project management. The integrated approach also models the payment terms, penalty and bonus clauses of a contract to fully reflect the impact a project schedule will have on expected cash-flow. In addition, the integrated approach to project management supports ‘what-if’ simulation to enable project planners and sponsors to understand the implications of various project planning scenarios under consideration (such as allocating more resources to one project versus another or mitigating the impact of a supply disruption).

RapidResponse Integrated Project Management fully supports this integrated approach to project management, maximizing an organization’s ability to bring projects in on time, on budget, and delivering expected results. It leverages one data model and planning engine to accurately reflect the interdependence between projects and the supply chain. It provides one user interface that all project management and supply chain management planners and decision-makers can use to evaluate and plan projects, balance resource loads, monitor progress, simulate course correction and recovery alternatives, and manage towards the attainment of project-specific KPIs. And it aggregates projects into programs, portfolios, sites, regions and business units to provide project visibility, insight, and management at any desired level throughout the organization.

Project management comes of age

The function of project management, if thought of as the planning and management of a collection of tasks and resources to achieve a desired result, has been utilized for thousands of years (think of pyramids, ancient temples, the Great Wall of China, the Colosseum, or European castles and cathedrals from the middle-ages). The theory, framework, and tools of project management took a major step forward in the late 1800s and early 1900s due to the efforts of Frederic Taylor (father of scientific management), Henry Gantt (the creator of the fundamental planning chart that bears his name), and others. But it wasn’t until the 1950s that a more disciplined and structured approach to project management began to take root, first in the Aerospace and Defence industry and then in the Construction industry. Organizations in these verticals are project- driven, earning most of their revenue from the completion of projects and it was natural for them to be early adopters. Manufacturers, which are operational rather than project-driven, did not embrace formalized project management en masse until the early 1980s.

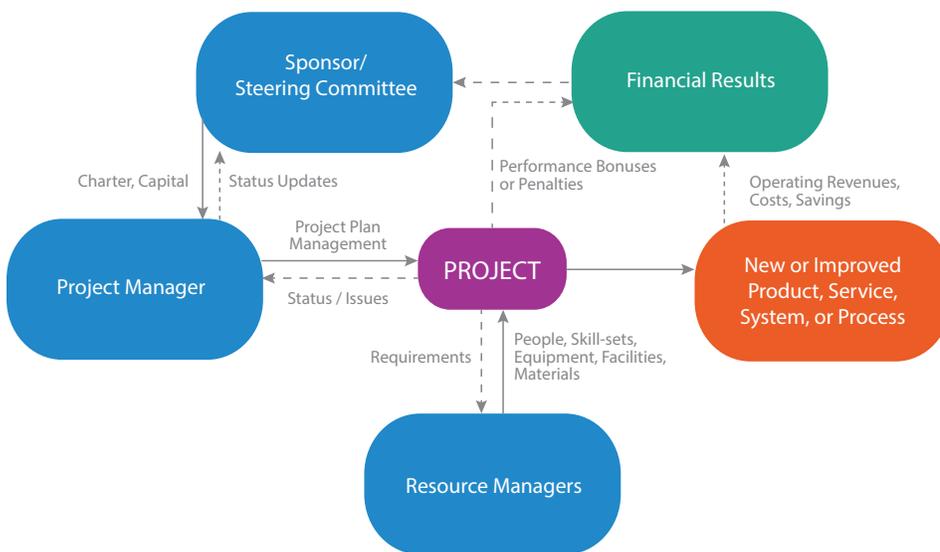
In the 1960s, two key organizations were formed that made significant contributions towards standardization, education, certification and promotion of the discipline of project management. In 1967, the International Project Management Association (IPMA) was founded, based in Switzerland and in 1969, the Project Management Institute (PMI) was founded in the USA. Today the PMI has over 600,000 members in 185 countries. It publishes the seminal “A Guide to the Project Management Body of Knowledge” or PMBOK® for short. Another key publication in this field is “Project Management: A Systems Approach To Planning, Scheduling, and Controlling” by Harold Kerzner, now in its eleventh edition.

Today, most organizations recognize that project management should be leveraged when tasks have some complexity, there are constraints of time, capital, and resources, multiple groups or departments are involved, or multiple activities need to be integrated to achieve the desired end. As a result, projects are becoming more prevalent and “operational” organizations are becoming more and more “project-driven” as they create and take new products to market, implement more efficient business processes, and upgrade or create additional production capacity.

Many software solutions are now available that enable organizations to do a good job of defining and managing projects (identify tasks, durations, effort, and dependencies; allocate resources; view schedule as a Gantt chart; monitor progress and update schedules).

Project management continues to evolve

A relatively recent evolution and extension of project management has been to manage a collection of projects together, giving rise to PROGRAM MANAGEMENT. Programs may be comprised of any number of projects but unlike projects, may not have a targeted end date (and in this sense, be operational in nature).



A successful project, according to Kerzner, is one that is completed:

1. Within the allocated time period
2. Within budgeted cost
3. At the proper performance or specification level
4. With acceptance by the customer/user
5. With minimum or mutually agreed upon scope changes
6. Without disturbing the main work flow of the organization
7. Without changing the corporate culture

Project management inputs and outputs

Another advancement in the field of project management has been the formalization of PORTFOLIO MANAGEMENT, which may be thought of as a collection of programs and projects at a higher level of aggregation. A fundamental element of portfolio management is the determination of which projects and programs should be undertaken to best advance the goals and objectives of the organization and then managing those holistically to achieve the intended results.

To be truly successful, companies need an organizational competency in the area of project management. Organizational competency is more than having skilled project managers, productive project team members and solid project management practices and procedures (although these are necessary elements). It means that the organization as a whole can select the projects that will most advance the business and support organizational goals, execute those projects effectively and efficiently (on-time, on budget) and then utilize their experience and learning to increase their competency even further.

As the practice of project management has continued to evolve, so have the tools and applications that support it. Initially most project management solutions were PC-based and intended for a single user. They then evolved to be client-server based, ultimately used by many people throughout an organization. Over time, these systems became very rich in features – but they also became overly complex, expensive, and cumbersome to deploy and support.

Recently, a new class of project management solutions have emerged that are “cloud-based”, available for use by anyone with credentials and access to a browser. These applications tend to be simpler and more intuitive to use than their predecessors but offer core functionality, accelerated implementation, and reduced risk and cost.

Project management needs another breakthrough innovation

As important as the advancements in standards, resources, and tools have been, significant gaps still exist for organizations managing a portfolio of large, materially-intensive projects.

- ▶ **Changes in availability of critical supply are not reflected in the project schedule.** Delays in the availability of material can quickly derail a project schedule. A Project Manager requires immediate notification when an event occurs that will impact a project's critical path. While less prevalent, accelerations in material delivery can also cause havoc if sufficient space is not available to store the material.
- ▶ **Project schedule changes which drive material need dates are not reflected in the supply chain management system.** Project schedules can be quite fluid and often the delta between the baseline schedule and the current schedule can be significant. Yet these changes are typically not reflected in the prioritized action list for buyers and material planners who instead must rely on someone notifying them that the need dates have changed.
- ▶ **Project Teams and Operations tend to function independently rather than collaboratively.** These groups generally have different frameworks and perspectives and use different systems – all of which can lead to an “over the wall” syndrome.
- ▶ **The ability to simulate potential schedule changes and course corrections, if present at all, is generally immature.** Many project management solutions support the creation of schedule scenarios but are limited in their ability to assess how each alternative supports project and organization KPIs and don't facilitate collaboration on the resolution by both project team members and operations.
- ▶ **The financial implications of project schedule changes and potential course correction alternatives are generally not fully modeled.** Contract payment terms, performance bonus and penalty clauses need to be modeled along with resource loads and expediting costs when evaluating schedules and course corrections.

These gaps limit project teams from achieving peak performance and reduce the likelihood of completing projects on time and on budget. As a result, projects are more likely to experience:

- Missed billing/revenue milestones
- Missed performance bonuses and incurred performance penalties
- Reduced or delayed cash-flow
- Cost overruns
- Excess inventory (and with it, excess tied-up capital)
- Inefficient resource utilization (due to idle or overburdened resources)

“In an uncertain business and economic environment, project and portfolio management (PPM) leaders are focusing heavily on improving speed, accuracy and agility, while managing risks and costs. PPM leaders are looking for solutions to support these seemingly conflicting objectives.”¹

Key definitions

Project: A temporary endeavor undertaken to create a unique product, service, or result.

Program: A group of related projects managed in a coordinated way to obtain benefits and control not available from managing them individually.

Portfolio: A collection of projects and/or programs and other work that are grouped together to facilitate effective management to meet strategic business objectives.

Project Management: The application of knowledge, skills, tools, and techniques to project activities in order to meet or exceed stakeholder needs and expectations from a project.

Project Management Institute, [A Guide to the Project Management Body of Knowledge \(PMBOK® Guide\)](#)
— Fourth Edition, 2008

Integrated project management: A quantum step forward

Since its earliest days, Project Management has been about integrating tasks, resources, and constraints into a holistic, achievable plan that would meet the objectives set by the project sponsor. As the discipline of project management has matured, the language and expectations of how to do this with excellence have sharpened. The frameworks, processes, and tools employed have continued to evolve and strengthen. But in order to fully realize the vision outlined in the PMBOK®, there are some key additional advancements required in project management practices and solutions.

To be truly integrated requires that ALL KEY RESOURCES be fully reflected and managed within the project. Project Management solution providers and project managers have tended to emphasize people and skill sets and often, MATERIAL and CAPITAL are not given the same level of support and attention. Yet for capital and materially-intensive projects (such as refurbishing an aircraft, bringing a new telecommunications device to market, or bringing a solar farm online), they are equally important and need to be considered first-class resources to be modeled and managed as part of the project.

The initial project schedule will drive a NEED DATE for a material requirement. But the baseline project plan should be based upon the PROJECTED AVAILABLE DATE for required materials. Given sufficient lead-time, these will likely be the same. But when projects have a compressed schedule or include requirements for long lead-time materials, these dates may differ significantly.

Project material requirements integrated with supply chain

In many cases, material availability will change as the project proceeds. Shipments may be delayed, reduced or fail incoming inspections. These changes can derail a project – having early visibility to this and an ability to mitigate the project schedule impact is crucial.

In addition, project changes may significantly impact material need dates. For example, a delay in the critical path may push the need date for certain material out to the right – this need date needs to be reflected in the supply chain if alignment is to be maintained.

Contract terms incorporated in project model

Many projects are governed by contractual terms that outline billing milestones and performance penalties and rewards. Missing certain milestones can delay revenue, nullify bonus payments, and trigger penalty clauses. This can have a significant impact on an organization's cash-flow and project profitability. Sometimes these delays are unavoidable but often options exist for keeping the project on track and avoiding these negative outcomes. But these options likely have a cost associated with them and may impact other projects. As a result, the financial implications of any action must be considered not only within that project but across all projects, programs and portfolios – and indeed across the supply chain.

Resolution alternatives modeled and impact assessed

Another fundamental element of the integrated approach to project management is the ability to model multiple project schedule alternatives and quantify the impact each will have upon organization and project KPIs. Current project management solutions and practices tend to focus on schedule and personnel, exploring options for getting the project back on schedule or level-loading resources. These are important goals but true integrated project management must also consider the impact the proposed project schedule will have on cash-flow, revenue, and profit. It must also consider the impact the proposed schedule will have on the supply chain and how current and projected supply will impact the project schedule. And it needs to support the comparison of alternative schedules and course corrections with each other and against the project baseline and current plans in order to understand the deltas, enabling the best path forward to be selected.

About PMBOK®

PMBOK® subdivides project management into several areas, beginning with Project Integration Management which "includes the processes required to ensure that the various elements of the project are properly coordinated. It involves making tradeoffs among competing objectives and alternatives in order to meet or exceed stakeholder needs and expectations. It consists of project plan development, project plan execution, and overall change control".

PMBOK® identifies 6 project resources:

- ▶ Personnel
- ▶ Capital
- ▶ Materials
- ▶ Equipment
- ▶ Facilities
- ▶ Information

Vignette: The unintegrated supply chain

Imagine a scenario where a buyer learns that a supplier of material required for a project has suffered a machine breakdown and can no longer ship the required material on the agreed upon date. The buyer has been told the project is a top priority and decides to use premium freight to minimize the delay. He notifies the Project Manager that the material is going to be late by one day and goes home pleased that he was able to minimize the project schedule impact.

He later receives an email from the Project Manager informing him that the need date for this material has moved to the right by three weeks! He feels less elated as he realizes he spent a considerable amount of money and time arranging to have the material expedited. He would feel even worse if he realized that there was not sufficient room to store the excess materials. If the true need date was reflected in his prioritized action list, he could have directed his time to his actual priorities, saved the company money, and avoided further complicating the project by unnecessarily tying up valuable space.

Vignette: (Part I)

Knowing the problem is half of the solution!

A program manager was reviewing her dashboard and noticed her program was projecting a significantly negative cash-flow variance. Exploring further she could see that the projected completion date of the largest project had slipped by 22 days. This project was high profile, both for her company and the customer. They had agreed to a sizable penalty if the project was delayed by more than 20 days.

In addition, she remembered the president's update last week asking everyone to double efforts to bring revenue into the current quarter where possible. The current project completion date had slipped to the following quarter, negatively impacting this quarter's billings.

Somehow she needed to figure out how to bring this project in by at least 3 days to avoid the costly performance penalty. Hopefully, she could even find a way to achieve the original target date, collect the performance bonus, and book the revenue in the current quarter!

Together, these innovations enable a breakthrough in project management performance.

RapidResponse integrated project management: Truly integrated

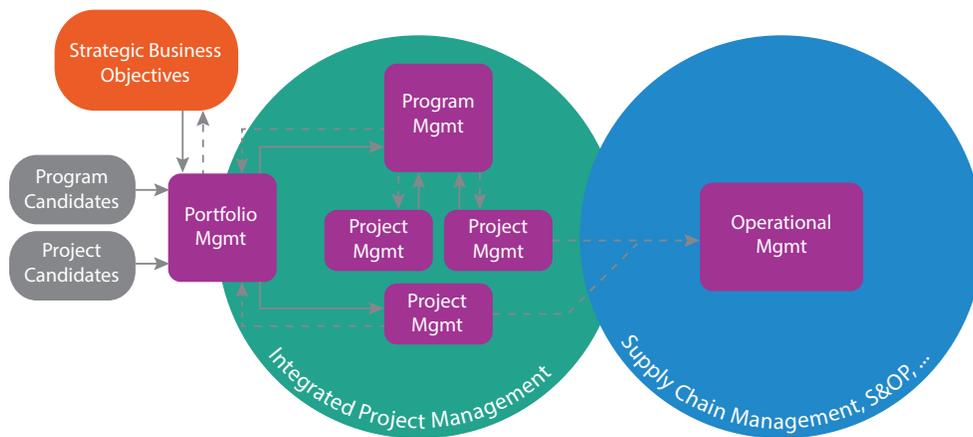
With its recently released Integrated Project Management offering, Kinaxis has stepped forward to provide a project management solution that fulfills the vision of Integrated Project Management so important to organizations that manage multiple, large, materially-intensive projects and programs.

ONE integrated system

RapidResponse Integrated Project Management enables an organization to model all their projects and their entire supply chain together in ONE environment. The implications of this can hardly be overstated. No more silos and artificial boundaries. All project and supply chain participants have access to the same information. No need to manage project plans in one system, status reporting in another, ad hoc analyses in Excel, and demand, supply, and S&OP in ERP and potentially other systems.

Having both project management and supply chain management in one system enables comprehensive, global visibility, facilitates collaboration, and accelerates issue resolution.

This also means that as some projects and programs move into an operational phase, they can continue to be managed from the same environment. A good example of this would be New Product Introduction. In this case, developing the initial product and getting it ready for production would be treated as a project but then would transition to the supply chain for planning and management of demand and supply.



The Power of ONE
 every ONE
 around ONE view
 making decisions as ONE team
 empowered by ONE product

Integrated project management lifecycle

Vignette: (Part II)

Evaluating potential resolutions is most of the rest!

Now that she understood what she had to try to do, the Program Manager created a new planning scenario in which she moved some key resources from another project and expedited some materials. Together these actions reduced the projects critical path by 25 days, creating a slight buffer.

Expediting is not free and the margin on this project would suffer somewhat as a result but not nearly as much as it would if the performance penalty was incurred.

The project that she borrowed some resources from would now be completed a bit later but there were no performance penalties associated with that project. She was confident that she could make other minor adjustments to further level load resources and perhaps even bring that project in on time as well. But her first action was now clear.

COMPLETE Visibility

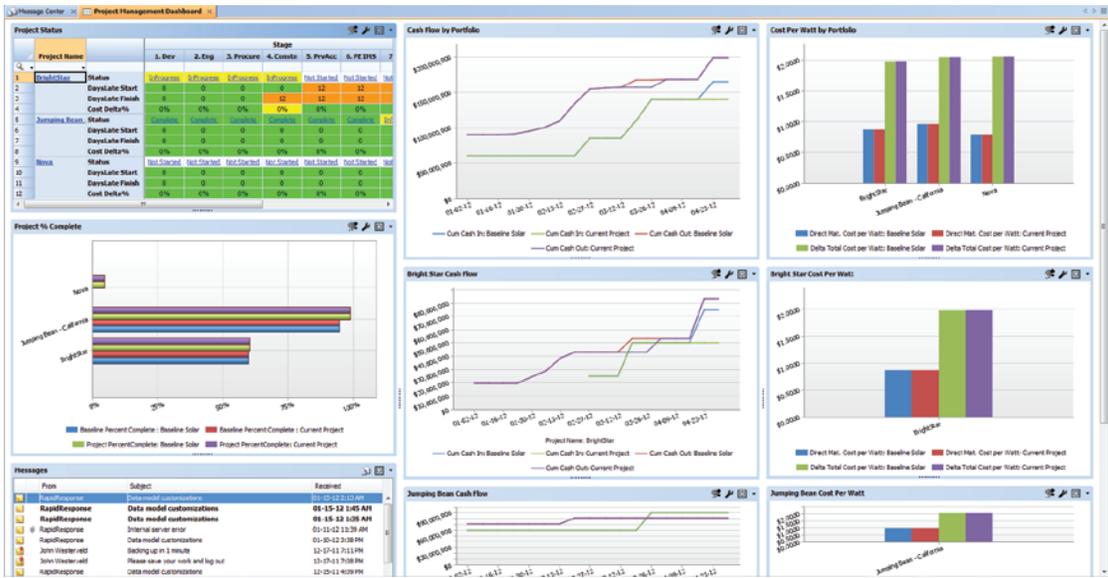
RapidResponse Integrated Project Management provides complete browser- based visibility to both projects and the supply chain. Anyone with access rights can see anything they need to from their desktop, laptop, or mobile device, anywhere in the world. This is fundamental to project risk mitigation as timely visibility provides the earliest opportunity for corrective action.

Configurable dashboards provide insight into current status at any level. Projects can be aggregated into programs and further aggregated into portfolios. They can also be aggregated along organizational lines to provide visibility by site, region, division, or the organization as a whole.

Dashboards also summarize and compare different plans including baseline plan, current plan, and any potential alternative plans being explored. In addition, project-specific KPIs can be created to track the metrics most important to the project team and organization.

RapidResponse provides support for all roles required to select, plan, manage and execute projects effectively:

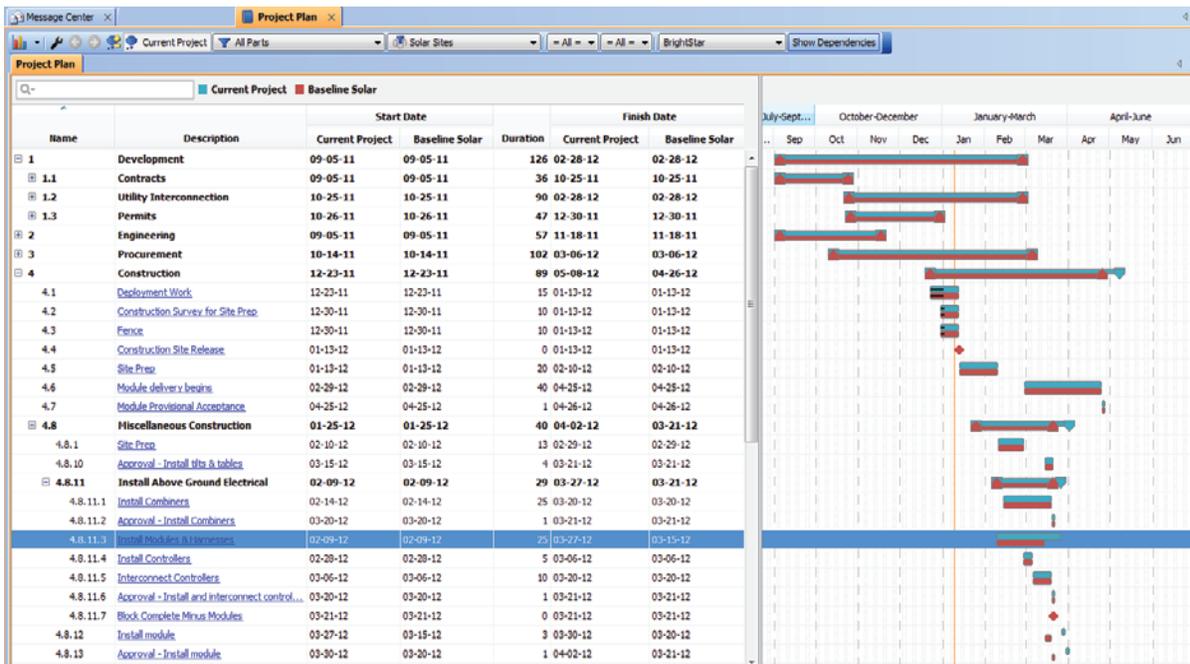
1. Portfolio Manager
2. Project Sponsor
3. Program Manager
4. Project Manager
5. Resource Manager
6. Finance Manager
7. Supply Planner / Buyer



RapidResponse dashboard

In this environment, the interdependence of projects and the supply chain is clearly visible. For example, the impact of a delayed supply is immediately apparent to a project manager whose project has been affected. Sponsors monitoring portfolio performance can quickly see how their portfolio of projects is progressing and filter to particular projects of interest to explore in more detail.

Role-specific workbooks and views are available out of the box to display both summarized and detailed information needed by each participant to track and report on progress. Like dashboards, workbooks can be further configured and modified to meet the specific needs and preferences of each user and can display and compare multiple plans or scenarios simultaneously. Within these workbooks, users can filter to desired scope and drill to details and related information as desired.



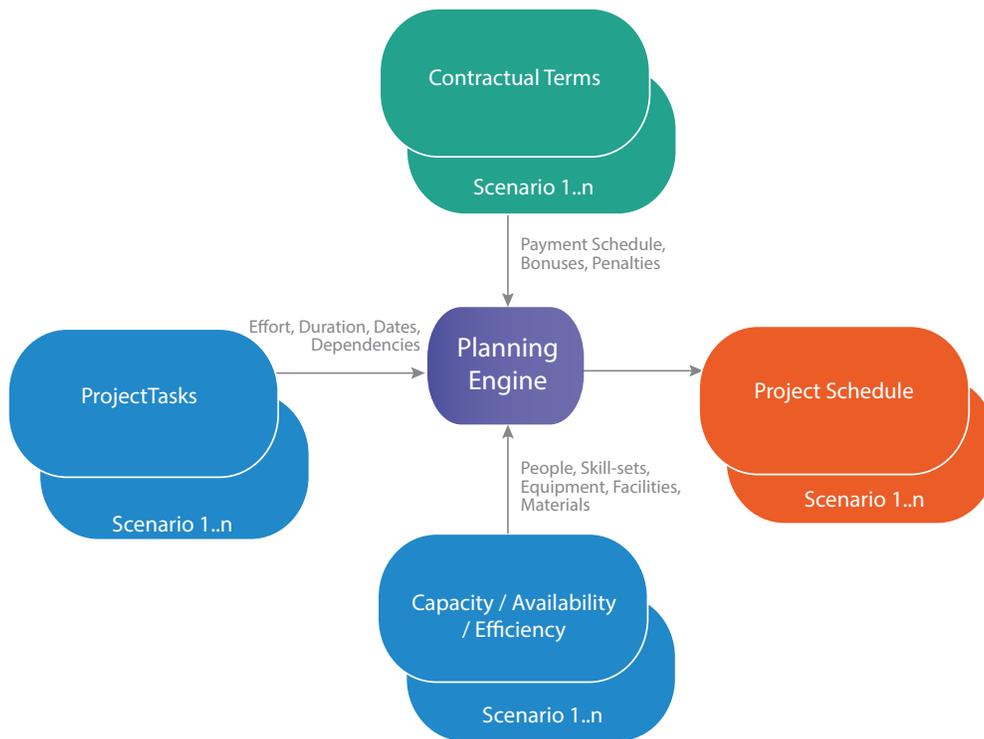
RapidResponse project plan worksheet

Alerting exists that will notify project managers when predefined events or conditions have occurred or are projected to occur. The alerting mechanism incorporates an awareness of not only the exception triggering the alert, but more importantly, the implications of the exception (such as project KPIs being negatively impacted). This enables the highest priority risks to be actioned first. For example, in a large project with many tasks and material dependencies, being alerted of every exception would create too much noise. Rather, a project manager may want to only be alerted to changes that will delay the project or impact profit margin by more than a specified threshold.

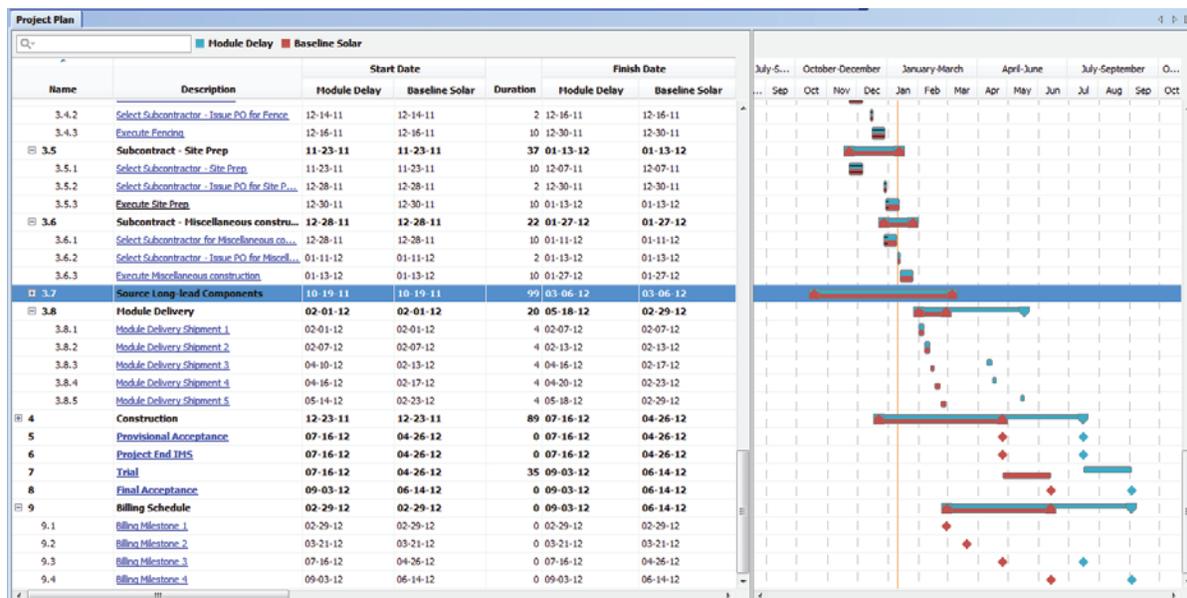
What-if simulation

RapidResponse Integrated Project Management enables different scenarios to be quickly tested, evaluated and compared to determine the full impact of various alternatives and the selection of the best course of action. Simulating multiple “what-if” scenarios enables a user to proactively assess risks and opportunities.

For example, a Project Manager could simulate a scenario of expediting material supplies and authorizing overtime to bring a project back on-schedule and avoid payment of a performance penalty. To do so, they would create a private, uncommitted scenario that would serve as their personal sandbox (in RapidResponse, each scenario appears as a separate instance of the entire dataset!). Within this scenario, they could then make any desired change to the schedule and immediately see the impact upon their project and potentially other projects and even the supply chain by leveraging dashboards and workbooks. If this change was positive, the project manager could then “commit” the change into the active project plan.



Integrated project management planning engine



Dual-scenario project plan worksheet - "What-if" simulation result

Collaboration

RapidResponse Integrated Project Management enables project members and operations (planners, buyers) to work collaboratively and iterate their way towards an updated project plan through the use of scenarios. This collaboration can be ad hoc or follow predefined workflows.

To facilitate this collaboration, the scenario owner would share a scenario with a team of people who can impact or be impacted by a proposed change. Each collaboration member can review the issue, propose changes, and see the impact of those changes immediately. An audit trail of each collaborator's actions is maintained so each collaborator can see what inputs and commitments other team members are making.

Together, these capabilities can power a truly integrated approach to Project Management.

The bottom line

Project complexity combined with changes to material, resources, and requirements make it extremely difficult and time consuming to keep projects on track and making maximum contribution to business goals and objectives. RapidResponse Integrated Project Management has been designed from the ground up to fulfill the vision of truly integrated project management. Through its unique approach and capabilities, project teams can function more effectively and significantly improve their ability to:

- ▶ Bring projects in on time and on budget
- ▶ Secure performance bonuses and avoid performance penalties
- ▶ Improve project cash-flow and profitability
- ▶ Level resource loads across projects
- ▶ Keep project plans current and credible and aligned with the supply chain
- ▶ Understand impact of supply chain changes and select best overall mitigation approach
- ▶ Manage project, programs, and portfolios more efficiently
- ▶ Provide consistent visibility and reporting on all projects and programs at desired level of granularity



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About Kinaxis Inc.

Offering the industry's only concurrent planning solution, Kinaxis helps organizations around the world revolutionize their supply chain planning. Kinaxis RapidResponse, our cloud-based supply chain management software, connects your data, processes and people into a single harmonious environment. With a consolidated view of the entire supply chain, you can plan expected performance, monitor progress and respond to disconnects when reality hits. RapidResponse lets you know sooner and act faster, leading to reduced decision latency, and improved operational and financial performance. We can prove it. From implementation to expansion, we're here to help our customers with every step of their supply chain journey.

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