SmartPM®

E-Guide

ROI for Smarter Project Management

Demonstrating the Quantifiable ROI of SmartPM

Learn how the right analytics can directly improve your project's ROI. This resource outlines the real cost of delays in construction projects - from increased costs for project owners to cash flow challenges for contractors and more. Learn how using project analytics can cut avoidable overruns by an average of 60%, with practical steps and examples to illustrate the financial benefits. Through clear, straightforward analysis and actionable insights, this guide is a practical tool for anyone looking to enhance project performance and protect their bottom line.

PREPARED BY:
Michael Pink, CEO, SmartPM

REDUCE AVOIDABLE OVERRUNS BY AN AVERAGE OF 60% USING PROJECT ANALYTICS

While **cost overruns** are an inherent risk in construction, not all are inevitable. A detailed analysis by KPMG reveals that the **average cost overrun** in construction projects **exceeds 10%** of the total project value. Further analysis uncovers about half of these overruns are preventable, with a significant portion – **60%** – stemming from delays in project timelines. This insight underscores the potential of Project Analytics.

Integrating a **comprehensive analytics program**, focusing specifically on timeline and progress analyses, makes it possible to address the root causes of delays directly, **avoiding upwards of 60%** of those preventable overruns.

Initial Cost Overrun = 10% Overrun x Project Value

10% x $50M **= $5M Initial Cost Overrun**

Identifying Avoidable Overruns = Avoidable Overrun (50%) x Initial Cost Overruns

50% x $5M **= $2.5M Overrun Identified as Avoidable**

Focusing on Delays: Average Delay-Driven Overruns x Avoidable Overrun Identified

60% x $2.5M **= $1.5M Directly Tied to Project Delays**

Solution Through Analytics

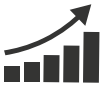
10% (Initial Overrun) x 50% (Avoidable Overruns) x6 0% (Delay Overruns) **= 3%**

The Role of "Root-Cause" Project Analytics in Mitigating Delays and Cost Overruns

"Root Cause" Project Analytics explores the interdependencies among different tasks and their respective parties, scheduled activities, and financial responsibilities. **By analyzing schedule and cost data over the project's duration**, you can gain valuable insights into project progression, performance metrics, delays, and potential future risks.

Benefits of Continuous Project Analytics

Enhanced Accountability



Improved Performance Metrics

Stronger Collaborative Efforts

More Strategic Decision-Making Processes

Achieving Project Goals and Outcomes

A Smarter Methodology for Project Analytics

The Project Analytics methodology outlined in this eGuide involves three stages: **Schedule Quality Review, Delay Analysis, and Predictive Analytics**. These stages align with industry best practices, adhering to guidelines established by the Defense Contract Management Agency (**DCMA**) and the Association for the Advancement of Cost Engineering (**AACE**).

Reliable Delay Analysis is contingent upon **Schedule Quality and Integrity**. Similarly, predicting feasible project completion dates relies on a thorough understanding of the historical origins of delays. This sequential order of operations is **critical** for ensuring the **accuracy and reliability** of the project data analysis.

The SmartPM Approach to Project Analytics

1 Schedule Quality Review

This initial phase focuses on evaluating the project's schedule quality and reliability, ensuring it meets all required company benchmarks.

2 Delay Analysis

Following the quality review, this step involves a detailed examination of the project's critical path, identifying and analyzing the causes of delays.

3 Predictive Analytics

The final stage leverages the insights gained from previous analyses to forecast project outcomes and identify potential future risks.

STEP 1: SCHEDULE QUALITY REVIEW

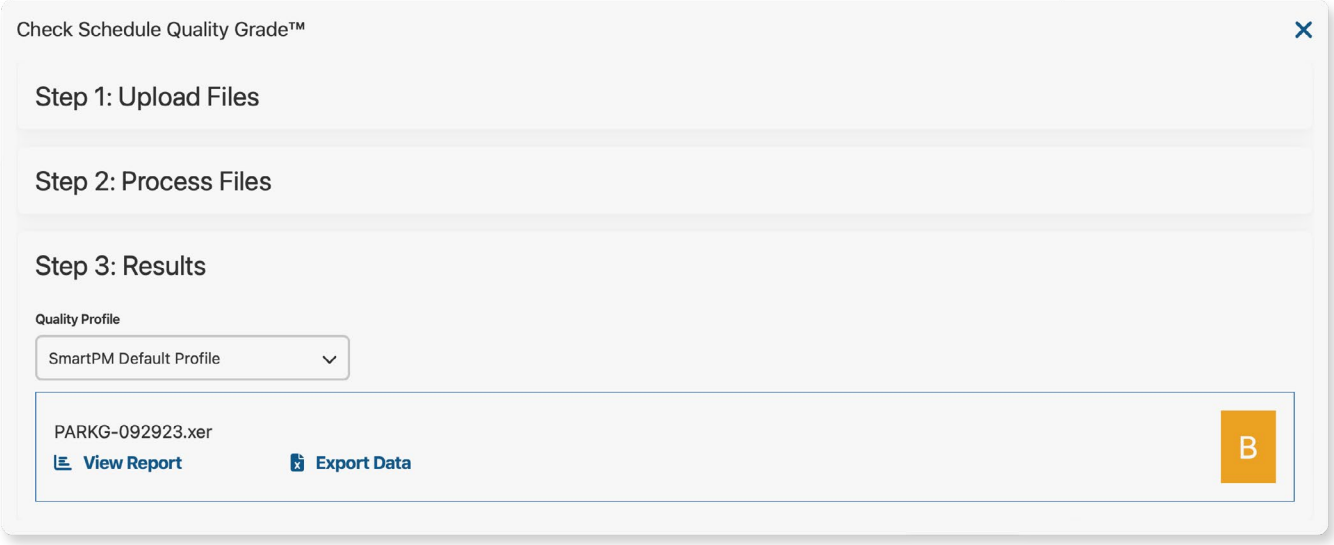
A quality schedule forms a reactive plan that clearly illustrates impacts and delays. However, while many tools can assess schedule quality, they often **bypass** the subsequent analyses – **Delay Analysis and Predictive Analytics**. This gap often results in a lack of actionable insights or meaningful business intelligence, limiting the scope of project oversight and strategic planning.

In contrast, SmartPM identifies **high-risk issues** affecting the **critical path** and **key changes** impacting the structure and integrity of the schedule. Doing so streamlines quality checks, improves grades quickly, and provides insights that no other tool does **without interrupting** current **workflows**.

Uncover scheduling errors to avoid downstream risk with instant quality analysis, letting you know exactly what to fix.

Quality Checker

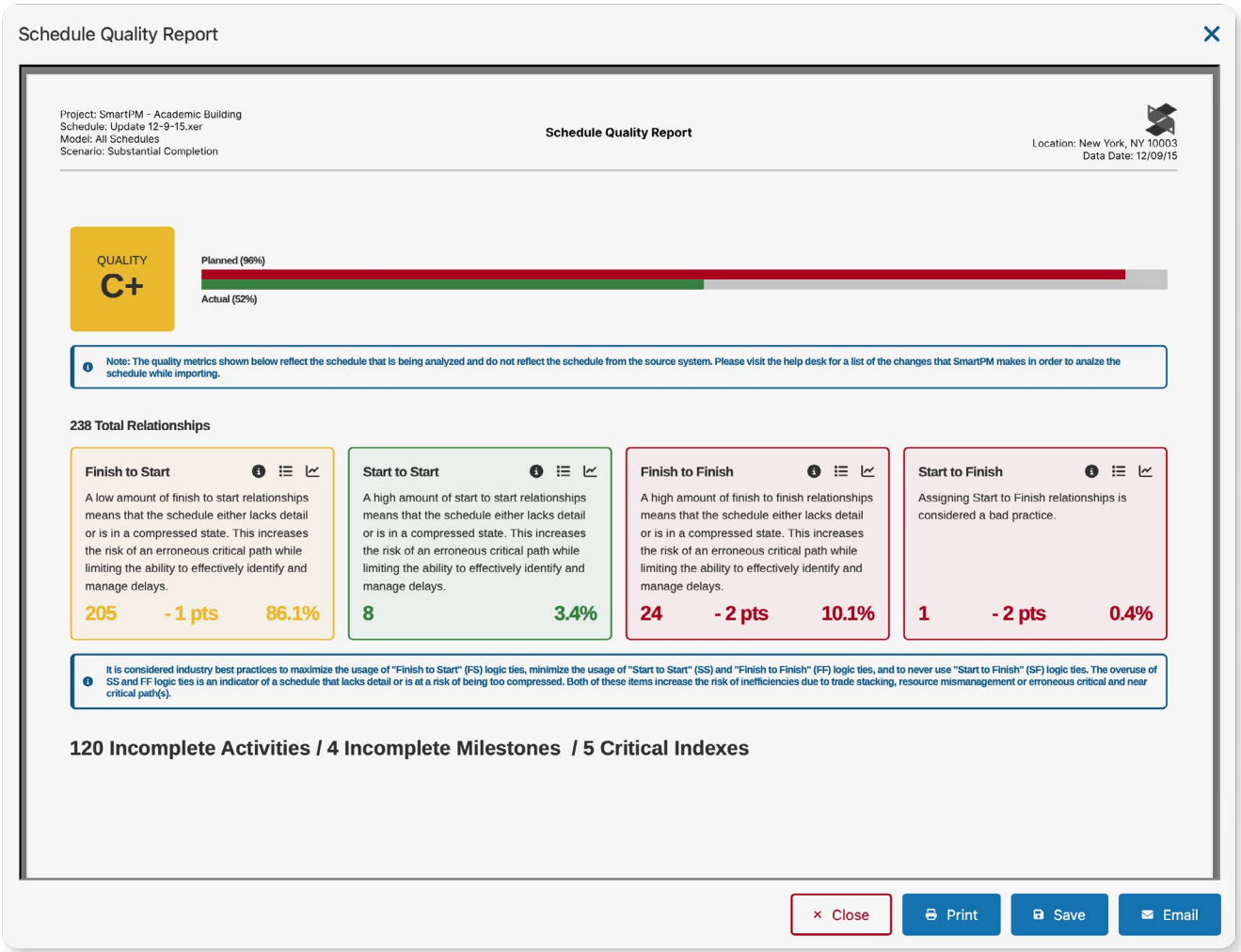
The **Quality Checker** helps get schedules up to par before importing them into a project slot.



Once a file is uploaded, the **Quality Checker** will verify if all activities are appropriately tied together, assign a letter grade, and deliver a comprehensive report.

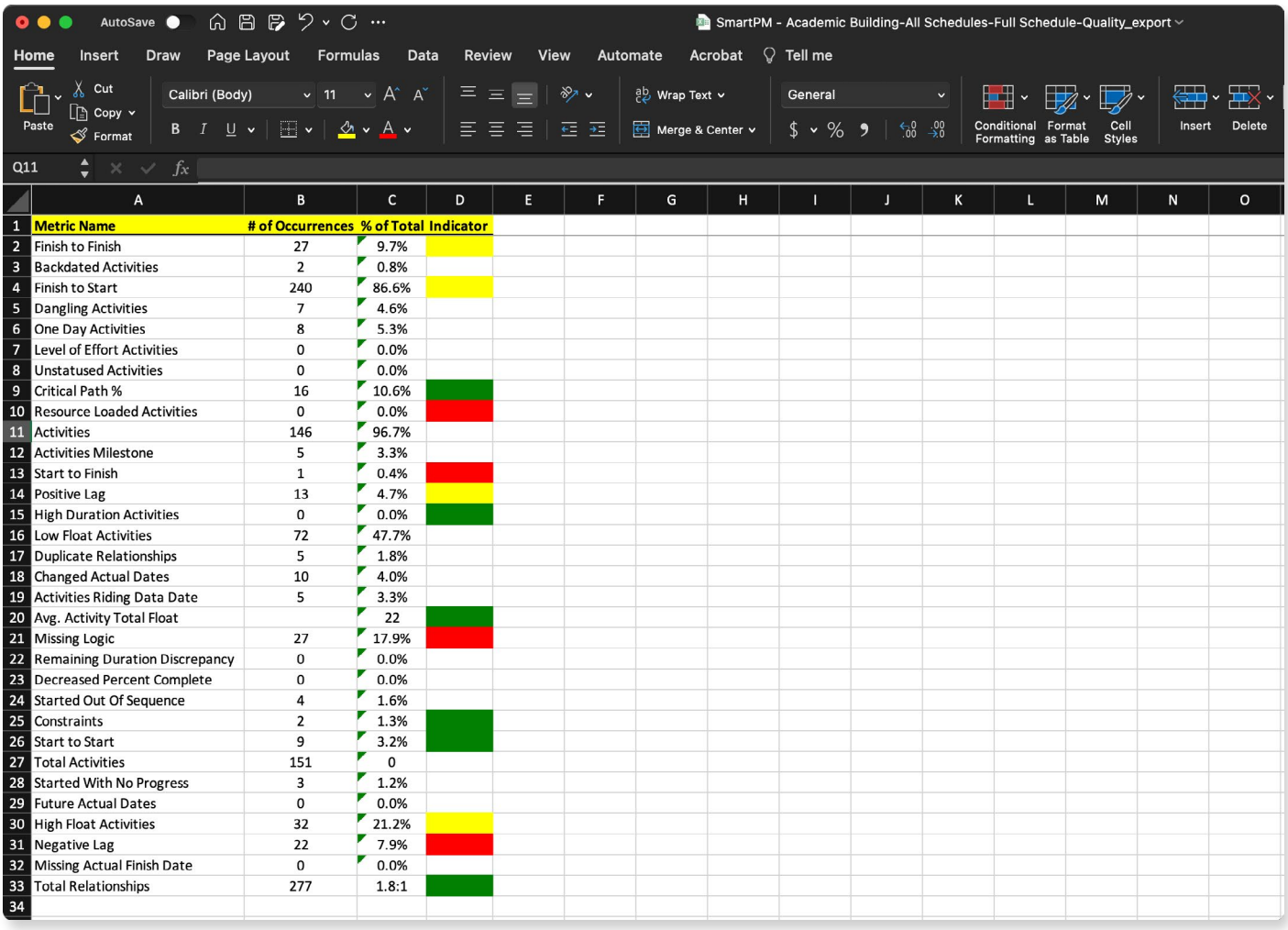
Quality Report

The **Schedule Quality Report** gives the details behind each Schedule Quality Grade. It explains the frequency of risk associated with every metric deemed a best practice for your organization.



Quality Spreadsheet Export

Download a comprehensive spreadsheet that provides the exact changes that should be made in your primary scheduling software.



	A	B	C	D
1	Metric Name	# of Occurrences	% of Total	Indicator
2	Finish to Finish	27	9.7%	
3	Backdated Activities	2	0.8%	
4	Finish to Start	240	86.6%	
5	Dangling Activities	7	4.6%	
6	One Day Activities	8	5.3%	
7	Level of Effort Activities	0	0.0%	
8	Unstatused Activities	0	0.0%	
9	Critical Path %	16	10.6%	
10	Resource Loaded Activities	0	0.0%	
11	Activities	146	96.7%	
12	Activities Milestone	5	3.3%	
13	Start to Finish	1	0.4%	
14	Positive Lag	13	4.7%	
15	High Duration Activities	0	0.0%	
16	Low Float Activities	72	47.7%	
17	Duplicate Relationships	5	1.8%	
18	Changed Actual Dates	10	4.0%	
19	Activities Riding Data Date	5	3.3%	
20	Avg. Activity Total Float		22	
21	Missing Logic	27	17.9%	
22	Remaining Duration Discrepancy	0	0.0%	
23	Decreased Percent Complete	0	0.0%	
24	Started Out Of Sequence	4	1.6%	
25	Constraints	2	1.3%	
26	Start to Start	9	3.2%	
27	Total Activities	151	0	
28	Started With No Progress	3	1.2%	
29	Future Actual Dates	0	0.0%	
30	High Float Activities	32	21.2%	
31	Negative Lag	22	7.9%	
32	Missing Actual Finish Date	0	0.0%	
33	Total Relationships	277	1.8:1	
34				

Get instant access to every correction necessary, allowing you to manage using quality schedules throughout every build.

Verify schedule integrity after each update to ensure project timelines remain feasible after activities are added, removed, or changed from any previous update.

- GAO-16-89G

After ensuring your project's schedule quality, you can move on to the next essential step: Critical Path Delay Analysis.

STEP 2: CRITICAL PATH DELAY ANALYSIS

Delays in the **critical path** are a major cause of project cost overruns, and these types of overruns often lead to the most disputes. When there are disagreements about construction delays, proving who is at fault or why the delay happened can be tricky. One of the biggest challenges is showing the direct connection between what caused the delay and the delay itself.

Identifying **critical path delays** demands ongoing oversight. It requires proactive delay analysis throughout the project, making adjustments to the schedule as necessary to **avoid** needing **external consultants or legal help** in the future. However, due to **time and resource constraints**, carrying out ongoing, real-time delay analysis without automated, data-driven tools is nearly **out of reach** for many firms.

	Period	Data Date	Scheduled End Date	End Date Variance	Net Critical Path Delay	Planned Delay Acceleration	Milestone Float	Schedule Compression Index™	
>	0	Jan 19, 2015	Mar 14, 2016	0 (In Period) 0 (Cumulative)	0 (In Period) 0 (Cumulative)	0 (In Period) 0 (Cumulative)	N/A	N/A	
v	1	Mar 26, 2015	Mar 23, 2016	9 (In Period) 9 (Cumulative)	10 (In Period) 10 (Cumulative)	1 (In Period) 1 (Cumulative)	N/A	3%	View Gantt

4 Delays (29 days)

- 12 - NTP's Issued (19 days)
- S40 - Demolition (6 days)
- S70 - Site Survey (1 days)
- 11 - Relocate Mural Offsite (3 days)

2 Actual Acceleration (19 days)

- S40 - Demolition
- S70 - Site Survey

>	2	May 01, 2015	Apr 08, 2016	16 (In Period) 25 (Cumulative)	20 (In Period) 30 (Cumulative)	4 (In Period) 5 (Cumulative)	N/A	1%	View Gantt

Early detection of critical path delays allows for **implementing corrective actions** before delays impact your end date, which is why real-time data is crucial. SmartPM automates critical path analysis, clarifying delays' impacts, isolating critical issues, and facilitating targeted interventions.

Using critical path analysis to **mitigate risk** involves understanding the root cause and contractual implications of **delays**. SmartPM provides a **detailed history of delays**, aiding in pinpointing causation and formulating effective recovery strategies.

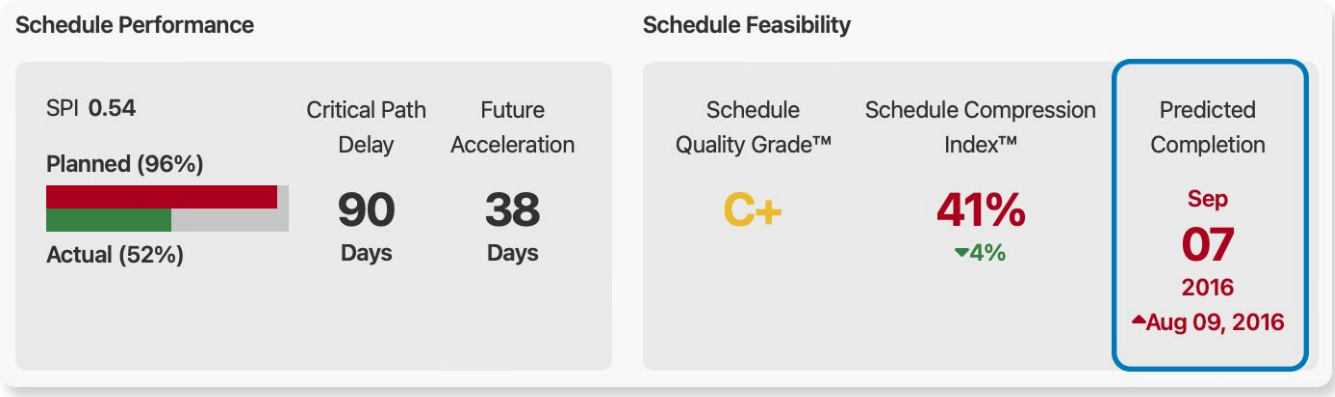
> “Some metrics we looked at in the past were lagging indicators. SmartPM provides leading indicators that give us time to adjust early and with more confidence.”

-Tom Carolan, Director of Scheduling at **Barton Malow Builders**

READ CASE STUDY

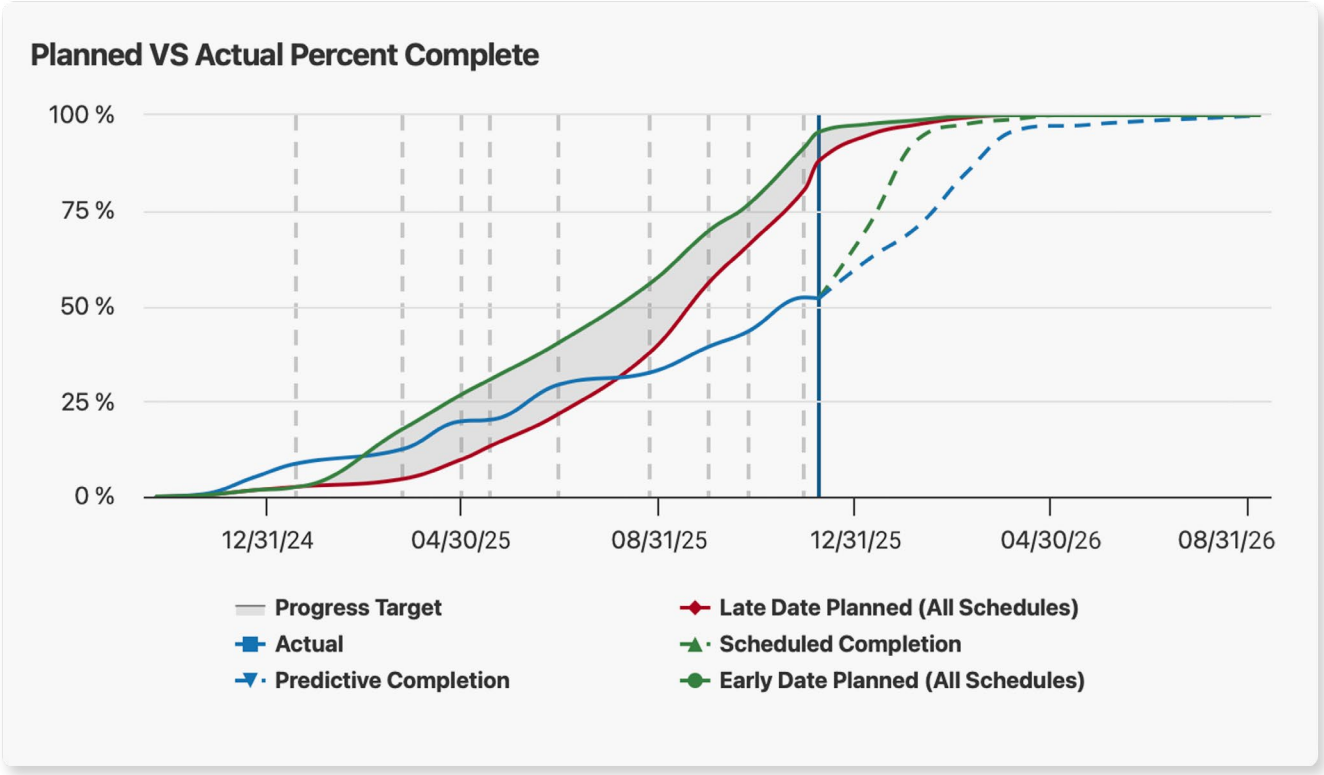
STEP 3: PREDICTIVE ANALYTICS

Predictive Analytics enhance strategic planning by **reducing** the financial risks of uncertainty. This analytical phase, which continuously evaluates past performance and deviations, allows project stakeholders to chart the most effective route toward project completion. In doing so, patterns can be spotted, and insights can be gained for **better decision-making** in the future.



Like the earlier steps of Schedule Review and Delay Analysis, conducting thorough Predictive Analytics **manually** is **time-intensive**. Many organizations are stretched too **thin** to adequately assess schedule quality, explore delay causation, and apply Predictive Analytics across all projects.

Often, the focus on immediate issues **leaves little room** for this **forward-looking analysis**, leading to reliance on **estimated end dates** that may not hold true. This reliance can have significant financial implications, especially when critical decisions hinge on projected timelines.



SmartPM significantly **enhances the productivity** of project analysts – by an average of **8X**, meaning every project update can be comprehensively analyzed within a **shorter** timeframe. Furthermore, by improving **Predictive Analytics**, you can **avoid** the **costly repercussions** of missed deadlines and misguided decisions that stem from insufficient data. Armed with Smarter Predictive Analytics, companies are better equipped to **foresee and navigate** potential project challenges, ensuring more accurate planning and execution.

> “If you see a wreck coming and you have 500 feet instead of 50 feet to stop, you will be in better shape. That’s what SmartPM does.”

-Joe Mannon, Director of Scheduling at **Manhattan Construction Company**

READ CASE STUDY

UNDERSTANDING THE RESOURCE INVESTMENT FOR PROPER PROJECT ANALYTICS

SmartPM's **exhaustive investigation** into best practices, analysis of **thousands** of project schedules, and numerous surveys have culminated in a detailed account of the hours required to **manually manage risk** throughout the Project Analysis process. This assessment varies by project size, offering a clear benchmark for organizations aiming to maintain or elevate project control standards.

Monthly Time Required Per Analysis by Project Size:			
Project Value	**Quality Review**	**Delay Analysis**	**Predictive Analytics**
> $10M	4 hours	13 hours	12 hours
> $25M	6 hours	20 hours	15 hours
> $50M	8 hours	22 hours	16 hours
> $100M	14 hours	32 hours	26 hours
> $250M	18 hours	36 hours	29 hours
> $500M	29 hours	56 hours	35 hours
> $1B	43 hours	83 hours	40 hours

For projects exceeding **$10 million**, the monthly distribution of work hours across the three key phases – Quality Review, Delay Analysis, and Predictive Analytics – starts at a minimum of **4 hours** for Quality Review, **13 hours** for Delay Analysis, and **12 hours** for Predictive Analytics.

As project value increases, so does the time required in each category, reflecting the growing complexity and risk management demands. For instance, projects over **$1 billion** require up to **43 hours** for Quality Review, **83 hours** for Delay Analysis, and **40 hours** for Predictive Analytics **monthly**.

Annual Time Required Per Analysis by Project Size:			
Project Value	**Quality Review**	**Delay Analysis**	**Predictive Analytics**
Projects > $10M	48 hours	156 hours	144 hours
Projects > $25M	72 hours	240 hours	180 hours
Projects > $50M	96 hours	264 hours	192 hours
Projects > $100M	168 hours	384 hours	312 hours
Projects > $250M	216 hours	432 hours	348 hours
Projects > $500M	348 hours	672 hours	420 hours
Projects > $1B	516 hours	976 hours	480 hours

Annually, this translates to significant investment in work hours, with projects over **$10 million** necessitating at least **48 hours** for Quality Review, **156 hours** for Delay Analysis, and **144 hours** for Predictive Analytics over the course of **a year**.

At the higher end of the scale, projects valued over **$1 billion** demand a substantial commitment of **516 hours** for Quality Review, **976 hours** for Delay Analysis, and **480 hours** for Predictive Analytics annually.

Practical Implications

Take a **$25 million project**, for example. Manual analysis requires approximately **6 hours monthly** for Schedule Quality Review alone, summing up to **72 hours annually**.

Delay Analysis demands around **20 hours** each month, or **240 hours yearly**, while Predictive Analytics needs **15 hours** per month, equating to **180 hours** over the year.

As project values rise, the required time investment also increases, highlighting the significant time and effort required for thorough, manual Project Analysis.

SMARTPM PROJECT ANALYTICS: A 90% REDUCTION IN TIME REQUIRED

The efficiency of SmartPM becomes increasingly evident when comparing the **traditional manual effort needed** for thorough project analysis with the **automated process** facilitated by SmartPM. The contrast in time investment is clear, particularly when managing multiple projects or larger-scale endeavors.

Illustrating Efficiency Gains

The chart below illustrates the **work hours** required to effectively manage risk across **five $25M projects** over the course of a year. Traditionally, the combined work hours for Schedule Quality Review, Delay Analysis, and Predictive Analytics are a substantial investment. SmartPM dramatically **reduces** this time investment by **90%**, as shown in the comparison below for a **single project** within the mentioned range value:

Annual Time Investment for Manual vs. Smart Project Analytics				
For a $25M - $50M Project	**Schedule Quality**	**Delay Analysis**	**Predictive Analytics**	**Annual Time per Project**
Manual Hours	72 hours	240 hours	180 hours	492 hours
Smart Hours	12 hours	24 hours	12 hours	48 hours

THE SMART DIFFERENCE

Annual Time Investment for Smart Project Analytics			
Project Value	**Quality Review**	**Delay Analysis**	**Predictive Analytics**
> $10M	48 hours	156 hours	144 hours
> $25M	72 hours	240 hours	180 hours
> $50M	96 hours	264 hours	192 hours
> $100M	168 hours	384 hours	312 hours
> $250M	216 hours	432 hours	348 hours
> $500M	348 hours	672 hours	420 hours
> $1B	516 hours	976 hours	480 hours

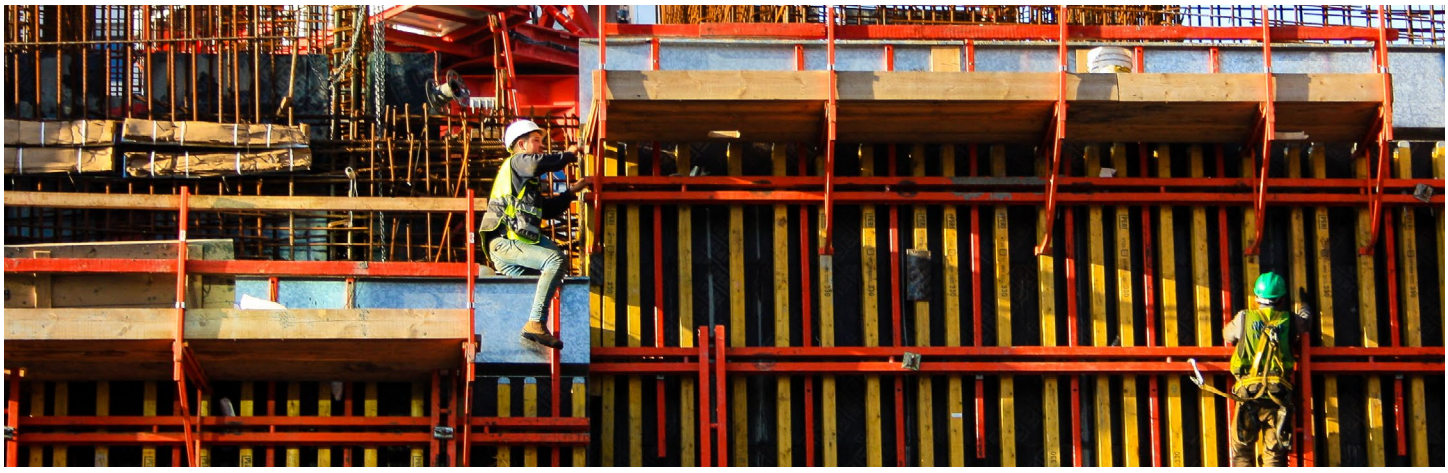
Each Project Requires:

Quality Review (72hr) + Delay Analysis (240hr) + Predictive Analytics (180hr)

= 492 hours annually per project

492 hours annually per project x 5 Projects

= 2,460 hours anually for Portfolio Analysis



SWITCHING TO SMARTPM, THE TIME SAVINGS ARE DRAMATIC.

SmartPM helps our clients **save time** and **money** on projects of all sizes – from a **$25M** multi-family development to a **$1B** infrastructure project. In fact, the larger the project and the more projects managed concurrently, the **greater the savings**.

However, for illustration purposes, we have created a simplified scenario using Company X, a fictional firm, with a project executive and project management team overseeing **five** ongoing **$25M - $50M** projects.

As discussed earlier, research suggests that a certain time investment is required for each analysis based on project size. As you may recall, for each **$25M - $50M** project, Company X must dedicate:

- Quality Review: **72 hours**
- Delay Analysis: **240 hours**
- Predictive Analysis**: 180 hours**

The total for all analyses adds up to **492 hours annually** per project, or **2,460 hours** for all five projects, for **optimized risk mitigation**. This means that Company X must dedicate an entire internal full-time employee to conducting these analyses, which is a privilege for many firms.

CURRENT PORTFOLIO MANAGEMENT APPROACH OF COMPANY X

Based on the time required for manual analysis, **Company X** should ideally invest **2,460 hours** annually to manage risk and ensure the effective management of its project portfolio. However, Company X's current strategy **falls short** of this benchmark.

The firm currently employs the equivalent of half a full-time employee (FTE) and four consulting hours monthly per project, totaling **1,240 budgeted hours** annually – **1,220 fewer** than the recommended **2,460 hours**.

ABOUT COMPANY X	
Project Size:	$25M
Number of Projects:	5
Duration of Projects:	12 months
# of Full-Time Employees:	.5 FTE: 80 hours monthly / 1,000 hours annually
# of Consulting Hours Budgeted:	20 hours monthly / 240 hours annually
Total Analyst Hours Allocated:	1,240 hours
Total Analyst Hours Required:	2,450 hours
Shortfall in Hours:	1,220 hours

This shortfall highlights a **critical shortfall** in Company X's capacity to engage in detailed project analytics and risk management. This under-allocation suggests that Company X is managing its project portfolio with only a **partial focus** on crucial analytics, potentially **overlooking** key insights that could **predict** and **mitigate** project risks and delays.

THE KEY QUESTION FOR COMPANY X IS: HOW MUCH RISK EXPOSURE ($$) DOES THAT MISSING 1,220 HOURS REPRESENT?

Company X's challenge in allocating adequate resources for Smarter Project Analytics directly impacts its **risk exposure**. By not meeting the ideal **2,460 hours** needed for comprehensive project analytics, Company X opens itself up to significant **financial risk** across its portfolio of five medium-sized projects. This analysis seeks to quantify that risk in four key areas.

1. Estimation of Manageable Financial Risk through Project Analytics

This step involves quantifying the financial risk that **Project Analytics** can potentially manage:

Total Project Value: The combined value of Company X's project is **$125 million**.

- **5 Projects x $25M = $125M**

Average Cost Overruns: At **10%**, this equates to **$12.5 million** across all projects.

- **10% x $125M = $12.5M**

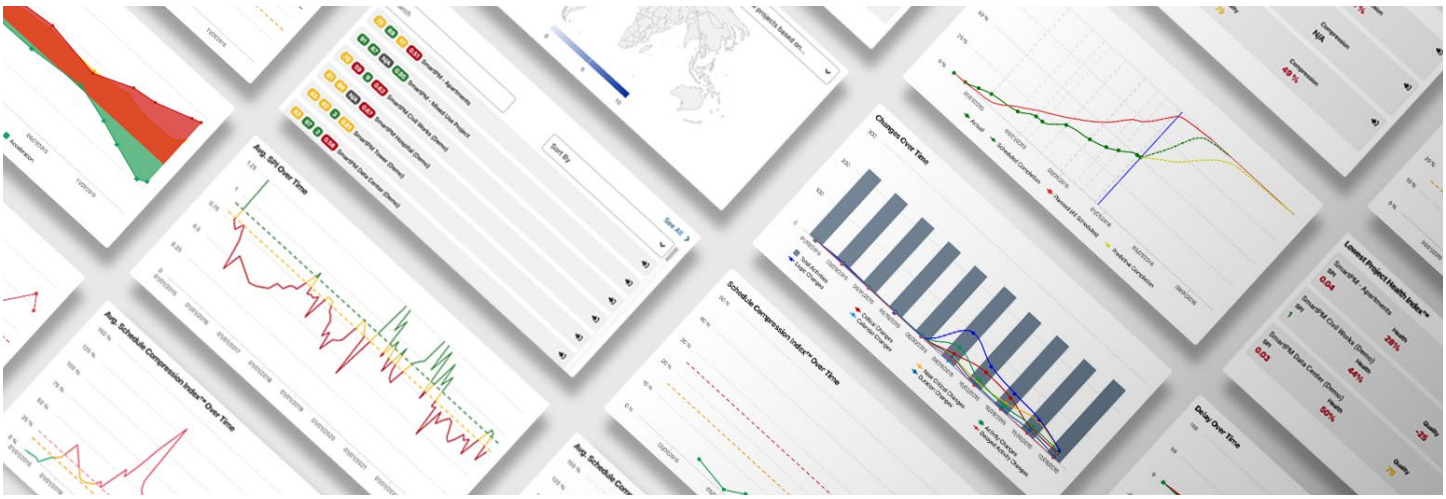
Manageable Overruns through Analytics: 50% of these overruns, or **$6.25 M**, are deemed preventable.

- **50% x $12.5M = $6.25M**

Delay-Driven Overruns: Specifically, **60%** of the preventable overruns, amounting to **$3.75 M**, are delay-driven and hence, manageable through Project Analytics.

- **60% x $6.25M = $3.75M**

Total Estimated Risk to Be Managed with Project Analytics = $3.75M



2. Allocation of Risk by Project Analytics Phase:

Next, **risk** should be spread across each phase. The manageable risk of **$3.75M** is evenly divided across the three core phases, assigning a **$1.25M risk value** to each:

- **Quality / Progress Review**
- **Delay Analysis**
- **Predictive Analytics**

3. Operational Prioritization and Risk Allocation

Given the specific sequential nature of Project Analytics, resources are first directed toward Quality Review, followed by Delay Analysis, and finally, Predictive Analytics if any resources remain.

	Quality Review	Delay Analysis	Predictive Analysis
Value of Risk	$1.25M	$1.25M	$1.25M
Time Required	360 hours	1,200 hours	900 hours
Time Budgeted	– 360 hours	– 880 hours	– 0 hours
Variance	= 0 hours	= 360 hours	= 900 hours
Percent of Risk Exposed	0%	30%	100%
Value of Risk Exposure	$0	$375,000	$1.25M
Total Risk Exposure: $375,000 + $1,250,000 = $1,625,000			

Full coverage for **Quality Review**, eliminating risk exposure in this phase.

An under allocation in **Delay Analysis,** exposing the company to a 30% risk, or $375,000.

No time for **Predictive Analytics**, resulting in 100% risk exposure, or $1.25M.

Summing up, the **unmanaged risk** translates to a financial risk exposure of approximately **$1.625M** across the five projects, given the partial resource allocation for Project Analytics.

What if Company X managed their projects the Smarter way?

To calculate Company X's **ROI** from implementing SmartPM, the analysis focuses on assessing **risk management efficiency** before and after the platform's adoption. This includes examining the costs associated with both scenarios.

SmartPM's ROI becomes evident when comparing the time investment of each approach. Originally, managing the total risk exposure of **$3.75M** necessitated **2,460 hours annually**.

Risk Expenditure:

Before SmartPM **$148,000** vs. After SmartPM **$136,000** **= $12,000 in Savings**

With SmartPM, this can be accomplished in only **240 hours**. Additionally, using SmartPM eliminates the use of consulting hours (**400% reduction**), translating to a **$36,000 decrease** in consulting expenses.

Annual Time Commitment to Manage $3.75M in Risk:

Before SmartPM **2,460 hours** vs. After SmartPM **240 hours** **= 2,220 hours / 92.5 days / 13 weeks in Time Saved**

Because of SmartPM's **flexible pricing model**, Company X's charge for **five** project slots is **$20,000**. Therefore, the total risk expenditure for managing risk with SmartPM amounts to **$136,000**, a notable decrease from the **$148,000** required without SmartPM.

Project Analysis Fees:

Consulting Expenses Avoided with SmartPM **= $36,000**

SmartPM Pricing for Company X **= $20,000**

ROI Calculations for Company X

Annual Expenditure	Without SPM		With SPM		ROI
Internal Analysis	$100,000	-	$100,000	=	$0
Consulting Fees	$48,000	-	$16,000	=	$36,000
SmartPM Fees	-	-	$20,000	=	$20,000
Risk Management of Losses	$148,000	-	$136,000	=	$12,000
Cost of Overruns Avoided	$2,167,000	-	$3,750,000	=	$1,583,000

Total Expected Saving = $1,595,000

ROI% = 7,875%

Annual Time Savings

Internal Hours Available Before SPM vs. Required After SPM

1,240 - 240 Hours = **1,000 Hours to Reallocate**

See What Smarter Project Management Can Do For You

In this guide, we've shared how SmartPM offered Company X a **comprehensive solution** for managing **project analytics**, demonstrating substantial financial and operational benefits. SmartPM, by facilitating a more efficient allocation of resources, allows Company X to save on costs, effectively manage greater risks, optimize consulting hours, and liberate staff hours for other strategic tasks.

This allocation leads to an annual savings of approximately **$1.6 million** across **five projects** against an investment of **$20,000** for SmartPM. Additionally, the savings realized from consulting fees alone can offset the cost of the platform.

The ROI for Company X, approaching **8,000%**, might sound ridiculous, but it aligns with the experiences of actual SmartPM users.

> "Shortly after we engaged SmartPM for a trial period, we realized we had found something that no other company could provide. The ability to present our teams with actionable, easy-to-comprehend performance-based metrics while quantifying schedule compression and feasibility made SmartPM the clear choice for us."

-Josh Bergstrom, **Ryan Companies**

READ CASE STUDY

SmartPM distinguishes itself as a leading provider of **project controls** and **performance analysis** for the construction industry. Unlike other software, SmartPM automates key analyses that, when known, can **significantly increase** your bottom line. From automated quality reporting to modeling "what-if" scenarios, SmartPM equips our clients with actionable insights, driving data-driven decision-making and efficiently prioritizing projects requiring immediate attention.

Developed by **industry experts** with **extensive experience** managing construction project risks, delays, and overruns, SmartPM is uniquely positioned to drive smarter, not harder, project management practices – as seen with Company X.

We invite your company to experience the **SmartPM difference** firsthand through a **complimentary ROI analysis**. Don't delay. See if we can help you drive smarter project management today.

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