



Increase project profits

Realizing more value from risk analysis

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REPORT SUMMARY

This report will set out why Cost/Schedule Risk Analysis (CSRA) is a key tool for protecting project profits and how Safran Risk can support project teams to further increase project profits by saving time and delivering more business value at each stage of the CSRA cycle.



Executive Summary

Time and time again, mega projects overspend and overrun. This report was developed in the conviction that this doesn't have to be the case.

Through the effective use of Cost/Schedule Risk Analysis (CSRA), it becomes possible to save time and increase project profits by seeing different versions of the future and making the right investment decisions. CSRA gets people from across a project talking, ensuring that risk analysis gets the attention it deserves and also provides a valuable function for improving project outcomes.

Compared to other risk-analysis tools, Safran Risk not only helps to speed up the CSRA process, but also enables project teams to squeeze more value from each stage of the process. As well as making the CSRA process transparent for project teams, Safran Risk helps users to understand the relationships between time and cost and ensure that data outputs are reliable and trustworthy.

Safran Risk also enables users to better understand the effect of different variables on their project, and the possible outcomes, through the ability to build, run and discuss different scenario models.

Its "Sensitivity Analysis" feature also shows project teams where they have the potential to make the most difference through risk mitigation activities.

Research findings show that there's a significant link between the level of an organization's project risk management maturity (PRMM) and the complexity of the projects it routinely undertakes, and business performance.

Well-delivered CSRA is a key ingredient in high-maturity PRMM and if carried out using a quality analytical tool, project teams are able to drive better decision making, leading in turn to improved time and cost outcomes.

As well as improving the quality of CSRA outputs, Safran Risk improves a project's PRMM, thereby protecting project profits. On "basic complexity" projects, total project cost can be reduced by up to 10%, while on "high complexity" projects, total project cost can be reduced by as much as 28%.

By adopting a risk-focused approach to project management, centered around quality CSRA, project teams can secure the support of key stakeholders while ensuring that infrastructure investments deliver value for money.

Total project cost savings using Safran Risk

10%
28%

on "Basic complexity" projects
on "High complexity" projects

Don't become another bad project statistic

According to a 2014 study by renowned mega project expert, Bent Flyvbjerg, 50% of major scale projects exceed their time and cost estimates.

50%

of major scale projects exceed their time and cost estimates

However, it doesn't have to be this way. Effective CSRA helps businesses to protect project profits by putting their risk data to good use, guiding their decision-making and helping to keep project targets on track.

Optimizing project outcomes

CSRA provides project teams with the closest possible thing to a crystal ball,

enabling them to use what they know (their project risk data) to find out what they don't know (the impact of different uncertainties and risks on the project's schedule and costs).

Ultimately, the goal for a project team is to be able to deliver a project as quickly and cost-effectively as possible, without compromising on quality levels.

For every large and complex project, there are likely to be numerous delivery approaches, each resulting in different time and cost outcomes. Effective CSRA allows project teams and decision-makers to see these different versions of the future.

Prioritizing risk conversations

Effective CSRA has other valuable benefits too. As well as helping project teams to get the best "bang for their buck" by making the right investment decisions, CSRA gets people talking. By bringing together people from different areas of a project, it ensures that risk isn't swept to the sidelines but is tackled head on.

Improving data quality

CSRA models can be a lifeline for improving data quality within the project. Schedules can be "stress tested" to identify areas of faulty logic; risk register data can be validated and the effect of best-guesses and uncertainty on activity durations can be understood.

By bringing data to life, project teams and decision-makers can find themselves having very different conversations.



A smarter approach to CSRA

In the world of project management, time is money. Safran Risk helps project teams to maximize actual project profits by not only speeding up the CSRA process, but also adding value at each stage of the cycle in the following ways:

Squeeze more value from CSRA

Whatever their level of risk management knowledge, Safran Risk provides people with a user-friendly and logical CSRA sequence to follow. It not only tells project teams what they need to do, and when, but helps them to optimize the time spent during the analysis phase.

Give risk the attention it deserves

Relying on static figures and tables alone can result in key stakeholders failing to engage with project risk data.

By enabling project teams to create diagrams and graphs rapidly and easily, Safran Risk brings team-wide engagement with meaningful risk management discussions to ensure project risk gets the attention it deserves.

Act on trustworthy insights

The quality of the outputs generated by CSRA will only ever be as good as the data inputs.

However, when a CSRA output doesn't look quite right, it can often be difficult to work out which input needs addressing,

especially when inputting a large volume of data in one go. Safran Risk's "Real-Time Analyzer" provides users with real-time feedback on input quality, ensuring outputs are accurate and trustworthy.

Understand the relationships between time and cost

Many risk models and software solutions often treat schedule and cost data as independent from one another. In fact, many people model them within different software!

Safran Risk allows both time and cost to be combined into one model, allowing project teams to not only understand the relationship between these two important elements, but to also work out how to optimize their project to achieve both to target, rather than leaving it to chance.

Consider the options

The future is complex and uncertain, so it is not practical to make decisions based on a single model.

The speed and simplicity of Safran Risk allows different scenario models to be built, run and discussed in a quick timeframe.

Project teams are able to understand the effect of different variables on their project, and better understand the ranges of possible outcomes. Even greater value is delivered as decision makers are able to quickly grasp the effect of their decisions, and what is required of them to influence a more successful outcome.

Driving better investment decisions

Project teams don't have unlimited time or budgets, so knowing how to spend these resources wisely is vital.

Effective CSRA helps them to better understand a project's cost and schedule sensitivities, enabling them to drive better investment decisions and achieve value for money.

On large-scale, complex projects, paying attention to every risk on the risk register is usually unrealistic.

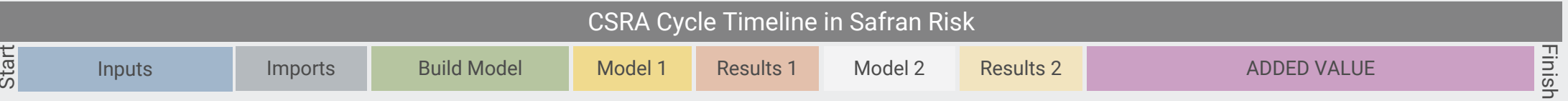
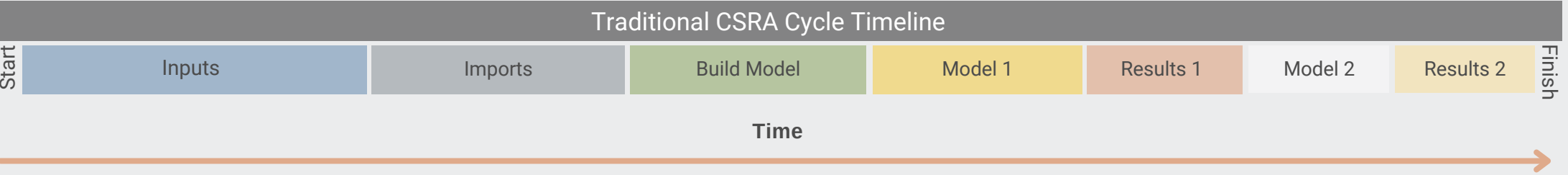
Instead, the insights generated by Safran Risk's "Sensitivity Analysis" feature show project teams where they have the potential to make the most difference through risk mitigation activities.

By applying a new lens to risk data, Safran Risk can inform teams about how to protect and increase project profits.



Driving better investment decisions

The below table sheds light on how Safran Risk supports project teams in protecting and increasing project profits by saving time and increasing the value delivered at each stage of the CSRA cycle:



Stage	Activities	How Safran Risk delivers time savings	How time savings add value
Collation of data inputs	- Schedule creation - Generating duration uncertainties - Generating schedule risks - Generating cost risks - Revealing risk correlations - Creating risk calendars	Global Risks feature – Enables project teams to quickly reuse previously validated risk data. Easy creation of risk weather calendars – Risk weather calendars can be created with easy importing of publicly available historic weather data, improving the accuracy of risk models. Integrated Cost Module – Streamlines the cost risk analysis process by removing the need to build a separate cost model or work with time-consuming resource-loaded schedules.	Increase output accuracy - The ability to start quickly with dependable data means project teams have more time to refine the accuracy of the risk model and its outputs. Bring stakeholders on board - Project risk managers have more time to engage the wider team to secure dependable risk data, improving stakeholder buy-in.

Stage	Activities	How Safran Risk delivers time savings	How time savings add value
Importing data and preparing to build the risk model	- Importing schedule files into Safran Risk - Running schedule checks - Checking alignment of key dates - Calendar rationalization - Applying Cost Breakdown Structures from an estimating database	Increased import speed and control – Compared to other risk tools, Safran Risk provides project teams with up to several hours less waiting time and greater control over the data imported from the P6 scheduling tool. Multiple calendar support – This feature makes it fast and simple to switch between multiple calendars from P6. Efficient validation of schedule quality - Safran Risk's "Schedule Checker" feature automatically warns of schedule quality concerns. Safran Risk contains a full schedule engine, enabling the user to jump directly to each schedule quality issue for immediate fixing. Alternatively, the risk manager can efficiently work with the planner tracking progress through their list of schedule warnings.	Improved integrity of risk models – The ability to address data model anomalies early on results in risk models that project teams can trust.
Building the risk model	- Assigning schedule risks - Applying duration uncertainty - Assigning cost risks - Applying costs - Linking costs to the schedule - Assigning correlations - Applying probabilistic branching and existence	Unique matrix approach to mapping risks and uncertainties – Other tools require risks and uncertainties to be mapped against activities in two separate stages. It is quicker to do both together and Safran Risk makes this a simple process with an easy-to-use interface. Real-Time Analyzer – This feature shows the immediate cost and duration impacts as risks and uncertainties are applied to activities. This means data errors and model anomalies are immediately spotted and corrected before a full Monte Carlo Simulation is run, when anomalies are impossible to notice or find.	Build multiple scenario models – Use the time savings to build a few scenario models to help inform the range of outcomes of the project, and therefore the range of possible decisions and interventions that could be made. Optimize the risk model's quality - Have enough time to discuss the most accurate mapping of risks and uncertainties, rather than taking a best guess.

Stage	Activities	How Safran Risk delivers time savings	How time savings add value
Building the risk model		Fast and flexible mapping of costs to the schedule – This enables integrated cost and schedule risk analysis, which is a more efficient and accurate way of analyzing costs and schedules. Furthermore, the effort and cost of licensing, maintenance and training are reduced with the need for just one tool. Re-using “Global Risks” – This feature provides a convenient hub to collect past risk data and experiences and enable their rapid re-use, so organizations continually learn from experience. Intuitive, process-flow interface – This helps infrequent risk analysts to quickly appreciate what work is already done and what step to do next. The easy-to-grasp interface encourages all kinds of specialists to engage with the risk analysis process and more readily contribute. Correlation Matrix – Allows multiple correlations to be visualized and managed all at once, rather than in disparate steps, hampered by context switching. User-friendly format and interface – Speeds up the process of inputting risk data.	Build the confidence to act on the outputs – Compared to other tools, Safran Risk better reflects a project’s evolving risk picture and any associated mitigation activities. This encourages project teams to contribute to risk management processes and capitalize on Safran Risk outputs. This not only improves the reliability of risk analysis insight but the confidence to act upon the insight drives up project delivery performance.
Initial analysis	• Running the model • Step-through analysis • Observe activity and cost behavior • Initial sensitivity analysis	Improved data analysis – Redstone Risk’s own performance experiment shows analysis, in some instances, could be up to 26 times faster than other CSRA tools and results in a greater breadth of valuable insights. Capacity for customization – Safran Risk makes it straightforward to tailor views and charts to suit the relevant audience.	Ensure more accurate data - The ability to spot data input errors quickly and easily means project teams have more time to refine the accuracy of the risk model.

Stage	Activities	How Safran Risk delivers time savings	How time savings add value
Initial analysis		Focus activities – This feature forecasts completion dates and costs incurred up to a range of selected milestones. This means the project team can “cut through the noise” and focus on whatever matters to reach their milestones. Combine pre, post and hybrid risks – Rather than treating them separately, Safran Risk enables these different types of risks to be analyzed side-by-side, which in many respects reflects a more realistic output to real-life.	Enhance time vs. cost understanding - Integrate cost and schedule risk analysis to model the feedback loops that interplay between time and cost in real life. Start using Safran Risk's "Joint Confidence Level" graphics to communicate the likelihood of achieving both time and cost objectives. Agree time vs. cost priorities and focus on what's most important to the business.
Reviewing initial results	• Viewing histogram and tornado results • Reviewing/discussing key drivers • Targeting areas for further scrutiny • Establishing necessary changes and supporting documentation • Distribution comparison	Improved communication of results – Highly visual outputs allow “story-telling” to a wide range of audiences. Wider choice of output formats – Helping project teams communicate the right messages to the right people. Distribution Comparison tool – Enables the rapid creation of comparison reports to make recommendations easy to justify, quickly achieving decision approvals. Helpful views of iteration results – Support fast forensic analysis and clean-up of modelling errors to quickly generate a high-quality model and trustworthy results. Safran Risk’s “Sensitivity Analysis” feature - Enables project teams to focus in on the most impactful drivers for time and cost overruns. This empowers teams to minimize attention towards distracting risks.	Engage the whole team to find the best solutions – Enable the whole project team to immediately compare immediate profitability results after suggesting combinations of risk mitigation strategies. Focus on profit – Safran Risk’s “Sensitivity Analysis” feature enables teams to focus time and investment on mitigation activities that make the biggest difference to project profit.

Stage	Activities	How Safran Risk delivers time savings	How time savings add value
Refined modelling	• Making updates to the model based on feedback and changes required • Re-running models in Safran Risk • Undertaking scenario modelling	Run more models – Safran Risk's greater speed of analysis and remodeling agility enable a greater breadth of possible outcomes to be assessed. Quickly compare different solution ideas – As projects evolve, certain risks will develop agreed mitigations while resolution strategies to other risks get debated. Rather than treating them separately, Safran Risk enables combinations of pre and post mitigated positions to be rapidly analyzed and the results compared.	Build a growing library of re-usable data – Safran Risk enables project teams to build a valuable database of the risks and their likely effects, resulting in a wider range of confidences. Be ready to protect profit – Safran Risk's ability to easily review multiple near-critical paths enables project teams to protect total project cost when surprises happen. Improve data quality – At this stage, Safran Risk allows project teams the time to revisit their risk input data. This enables these inputs to be discussed further rather than being left unchanged through lack of time.
Communicating results and decision-making	• Reviewing and discussing results • Generating completed sets of visual outputs • Collating data into a format suitable for export/analysis elsewhere	Reviewing risk-adjusted cashflow – Safran Risk enables project teams to easily compare risk-adjusted cashflows with the original deterministic cashflow. More intelligent analysis – Access to distribution comparison charts for the different scenarios and the analysis of specific iterations and scatter plots enables users to better understand how the model behaves.	Increased decision-making confidence – Project teams have more time to explore different variables and outcomes, helping them to get stakeholders on side with risk mitigation activities. Draw comparisons with similar projects – Distribution comparisons enable project teams to compare risk insights with those of similar projects. Reduce total project costs and accelerate completions – Through earlier mitigation of the most impactful time and cost drivers.

A focus on Project Risk Management Maturity (PRMM)

The world of project management is getting more complex. Interfaces are getting deeper, external environments are rapidly changing and time and cost pressures are rapidly increasing. Businesses, and their shareholders, are demanding more for less. Good risk management, and the way in which a business adopts it, is more important than it's ever been.

A 2019 study in the **International Journal of Engineering Business Management (Vol 11, 1-16)** validates that the level of a business' PRMM and the complexity of the projects it routinely undertakes have a significant bearing on the performance of those businesses.

As such, there are some significant business benefits, not just in terms of time savings, but also in tangible cost savings through the adoption of robust and effective CSRA. We have found that conducting effective CSRA as part of your project control procedures yields significant protection of project profits. One key element of project risk management maturity is CSRA. An effectively operated analysis process, undertaken by staff competent in its use, and a quality toolset such as Safran Risk, will yield a significant step-change increase in your business' PRMM.

With the management of risk and uncertainty as a key enabler to successful projects, it stands to reason that the more effectively a business can understand and manage its risks, the greater its chance of successful outcomes.

This is not just isolated to the physical management of risk however, but also in how effectively the business can leverage collective risk knowledge for smarter decision-making.

Having good quality, reliable CSRA output data enables the business to decide upon a course of action that fits its urgency and profit priorities, rather than just leaving it to chance.

Let us consider these two elements: Project Complexity and PRMM. We have classified 'basic' and 'high' project complexity and PRMM maturity levels to enable readers to identify where their projects and organizations sit, and what financial gains could be made, through the adoption of effective CSRA, via a toolset such as Safran Risk

Defining project complexity

Basic Complexity

- Low number of project interfaces
- Risks easily identified by the project team
- Little change expected throughout the project
- Decisions often made without any justifying analysis
- Clearly defined objectives, and understood by a wide group of stakeholders
- Routine or low complexity methods of delivery
- Routine or high maturity technology deployed

High Complexity

- High number of project interfaces
- Large volume of risks, with many unidentified, with uncertainty inherent across the project
- High degree of change expected throughout the project
- Analysis often required to guide decision making
- Objectives uncertain, or likely to change as the project progresses
- Methods of delivery that are mostly novel, with limited routine work
- Risky technology

Defining PRMM

Basic PRMM

- No documented risk management procedure
- Staff unlikely to have had risk management training, with external support often required
- CSRA not undertaken routinely on projects
- No interrogation of model outputs by decision makers
- Uncertainty assessments placed at summary levels
- Risk register exists but assessments not targeted at individual activities or cost items
- Risk information likely to be siloed across the organization
- No correlation applied to CSRA models
- No bases of estimates for CSRA input data
- One CSRA model per project

High PRMM

1. **Risk-based business processes form part of the 'modus operandi'.**
2. **CSRA modelling is easily understood by the project team and recognized as being of high quality such that it is trusted as a decision-making tool.**
3. **CSRA outputs are routinely used to make better decisions**
4. **CSRA outputs are proactively used to improve profit, schedule and cost outcomes**
5. **A project risk management culture exists within the business which is valuable and sustainable**

Expanded definition of High PRMM

1. Risk-based business processes form part of the 'modus operandi'.

- Documented risk management procedures, regularly updated
- CSRA undertaken on a more routine (i.e. monthly) basis
- Broad stakeholder buy-in for the CSRA process, contributing to inputs and making decisions based on outputs

2. CSRA modelling is easily understood by the project team and recognized as being of high quality such that it is trusted as a decision-making tool.

- CSRA models fully embrace easy-to-interrogate, modern analytical software
- Model outputs are tailored for each project's specific requirements
- Bases of estimates documented
- Uncertainty assessments specifically targeted to individual activities and costs
- Risk register exists, with specific assessments and activity mappings
- Correlation applied to the model

3. CSRA outputs are routinely used to make better decisions

- Routine reporting to, and interrogation from, decision makers
- Scenario modelling routinely undertaken to inform decisions within each project

4. CSRA outputs are proactively used to improve profit, schedule and cost outcomes

- Cost and schedule drivers understood for each project
- Integration of both cost and schedule risk models in a single file
- The business' sensitivity to project cost over-run vs. project schedule over-run are well communicated and used by the project team to agree justifiable risk-mitigation strategies

5. A project risk management culture exists within the business which is valuable and sustainable

- A deep-rooted understanding of how project risk management adds value to the project
- Support from senior management which can be evidenced
- Staff are competent in risk management, with formalized training and development in place with limited external support required
- Risk insight data is regularly compared between projects to leverage company-wide knowledge and learning
- Data from previous projects is captured and re-used to consistently improve the quality of risk input data

The relationship between PRMM and Project Profits

The International Journal of Engineering Business Management study, referenced earlier, found that organizations with high project complexity benefit from significantly improved performance when they have higher levels of PRMM.

Combining the findings of the International Journal of Engineering Business Management (Vol 11, 1-16) with a study of project improvement results from a set of leading project-risk experts, we have summarized the expected returns from applying different PRMM levels.

	APPLYING BASIC PRMM	APPLYING HIGH PRMM
HIGH COMPLEXITY PROJECTS	Expect final project costs to be reduced by 2% to 10%, by applying basic PRMM.	Expect final project costs to be reduced by 4% to 28%, by applying high PRMM.
BASIC COMPLEXITY PROJECTS	Expect final project costs to be reduced by 0.5% to 2%, by applying basic PRMM.	Expect final project costs to be reduced by 1% to 5%, by applying high PRMM.

Case studies used in the study on the left include

Case 1

A 15+-billion-dollar oil and gas project of “High Complexity”, initially had “Basic PRMM”. After 20 months the forecast cost over-run reached 63%. New high-maturity cost and schedule risk analysis processes were applied that helped to bring the final cost over-run down to 17%, which equated to a 28% cost reduction against the 63% over-run.

Case 2

A multi-billion-dollar oil and gas project of “High Complexity”, initially had “Basic PRMM”. After 30 months the project was heading for a final project completion cost that was unacceptable to both the project owners and partners. After applying high-maturity cost and schedule risk analysis disciplines, the final project completion cost was reduced by between 9% and 10%.

The relationship between PRMM and Project Profits

Therefore, it is clear to see that improving your PRMM, especially in more complex projects, results in some significant overall cost savings that far outweigh the investment in the toolset in the first place.

Of course, part of this involves the adoption of higher maturity risk processes, so it is important to invest the right energy and money in not just the toolset, but the associated risk processes and training within your business to realise these cost savings.

Why does this matter?

This report has shown not only the significant time savings available through the use of Safran Risk, enabling richer and more detailed CSRA to be undertaken; but that project profits are likely to increase by increasing an organization's project risk maturity, with increased benefit to those who operate more complex projects.

This maturity is not only based around the competence of the staff who undertake risk management, and the processes they use, but also the toolset they use. We believe that the advantages that Safran Risk offers in increasing your organization's project risk maturity, provides a compelling case for investment in the tool.



Taking back control

Time and cost overruns for large-scale projects shouldn't be a foregone conclusion. By front-loading their investment in risk management activities, with a focus on well-delivered CSRA,

project teams can help prevent history from repeating itself by planning for the best version of the future, while keeping stakeholders on side, and ensuring that investments deliver value-for-money.



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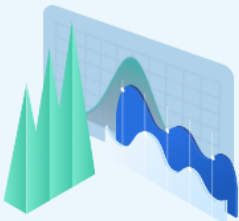
To discover how Redstone can help your organization assess its readiness to achieve "High Project Risk Management Maturity", [click here](#)



An Introduction to Safran Risk

Sign up for a free learning session and discover the power of integrated cost and schedule risk analysis.

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