

Project Controls Expo – 22nd November 2018

Melbourne Cricket Ground

**Schedule Quality & Project Success: How
Technology Can Bridge the Gap**

About the Speaker

- Chief Operating Officer for Prescience Technology
- 35+ years' experience in Enterprise Project Controls Systems.
- Involved in Enterprise Project Management since the 80s, using systems such as Artemis until the 90s and the Primavera suite of products for the past 15 years.
- Experience in the technical architecture & configuration of project controls products; advanced integration in Oracle Primavera, ERP products, SAP , Ellipse and others.
- Responsible for multiple implementations and upgrades of large-scale, complex, capital programs at an enterprise level



Wayne Wilson
Chief Operating Officer
Prescience Technology

About the Topic



A good schedule makes a great project. But what exactly constitutes a 'good' schedule, and how do you benchmark and standardise your project schedules against industry standards?



About Prescience Technology

Prescience Technology is the leading provider of integrated project controls services and technology solutions in Australia.



Founded in 2005



Australian based with international presence



Strategic partnership with Oracle & Deltek

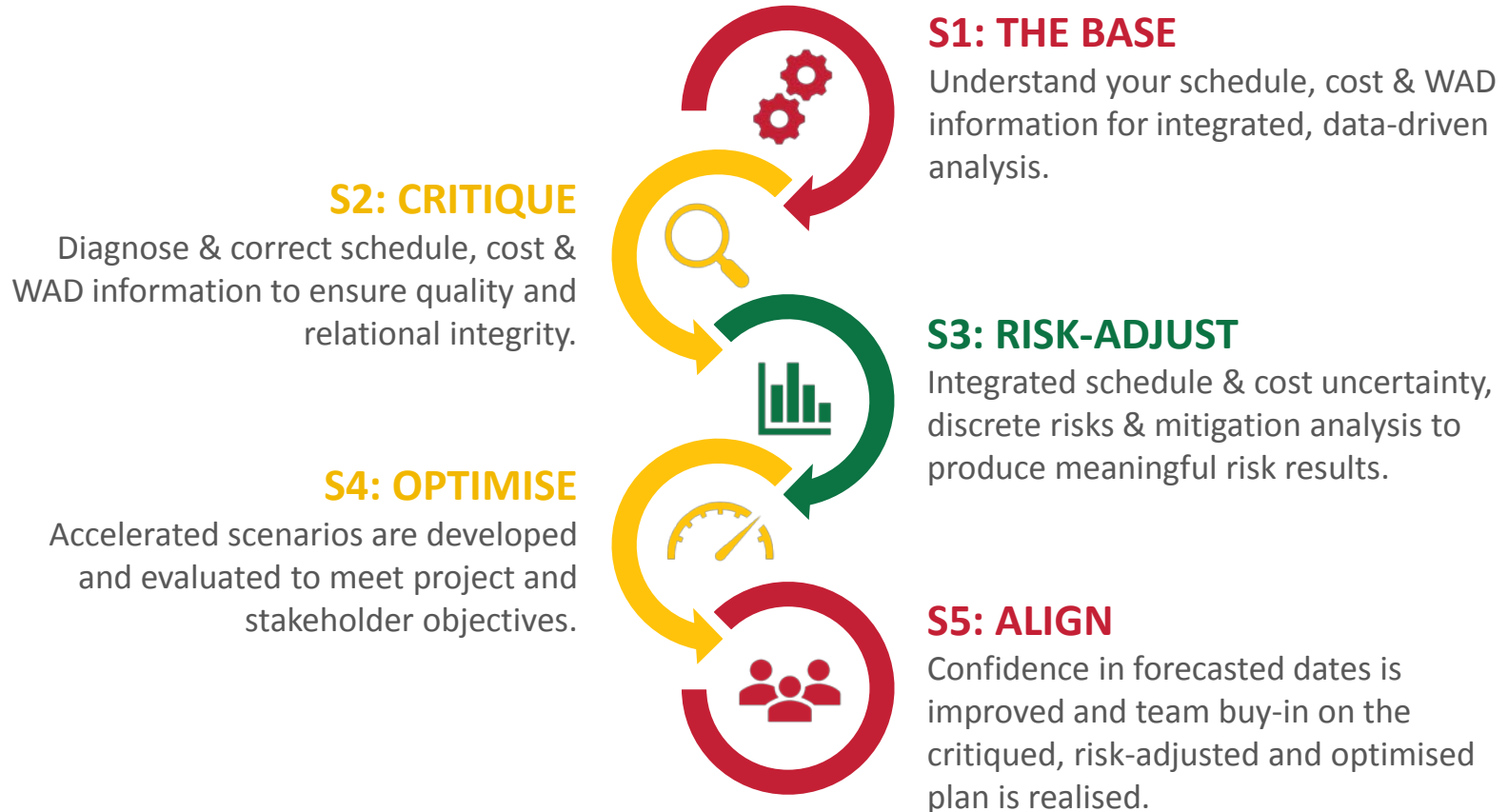


Award winning tech Consultancy



Capital and operational projects focus

Project Maturity Framework



The Goal

The end goal of the S1 – S5 schedule maturity model is to generate a schedule that is:



Structurally Sound

Well built using appropriate CPM scheduling techniques.



Realistic

Accounting for known scope as well as unknown potential risks and opportunities.



Optimised

Thoroughly reviewed for potential cost & schedule acceleration candidates.

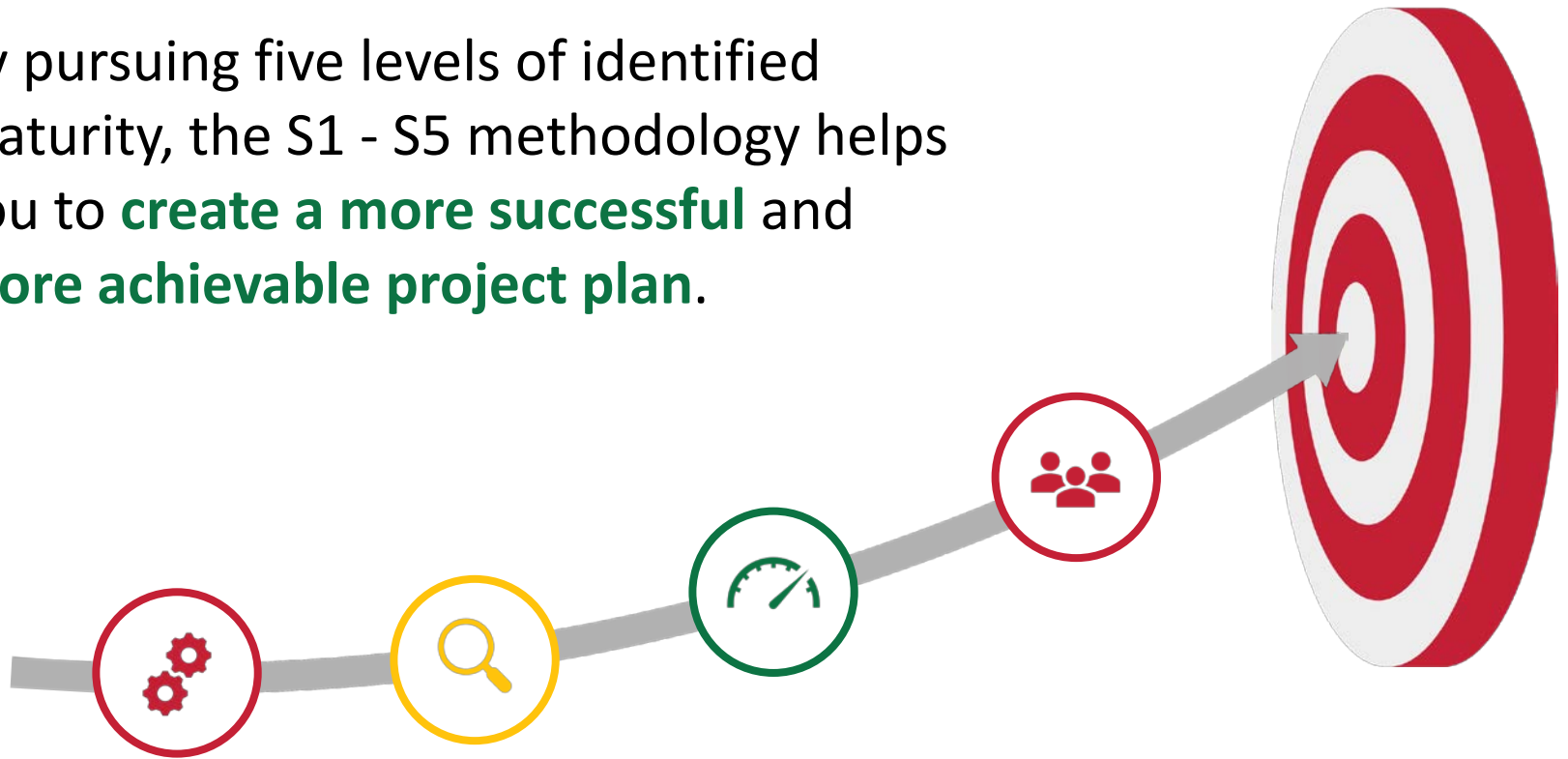


Validated

Buy-in obtained from the project team, subject matter experts and management team.

Why?

By pursuing five levels of identified maturity, the S1 - S5 methodology helps you to **create a more successful** and **more achievable project plan**.



S1-S2 Schedule Quality

Why Schedule Quality is important

1

The ability to meet schedule dates.

2


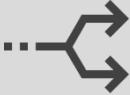







A poorly constructed CPM Schedule is nothing more than a colourful picture on a sheet of paper.

3

Enabling a scheduling tool to work properly, we must have a good built, logically driven schedule that the project teams have confidence in.

S1-S2 Schedule Quality

Elements of Schedule Quality Matrix

 <p>Missing Logic</p>	 <p>Logic Density</p>	 <p>Critical</p>
 <p>Hard Constraints</p>	 <p>Negative Float</p>	 <p>Insufficient Detail</p>
 <p>Number of Lags</p>	 <p>Number of Leads</p>	 <p>Merge Hotspot</p>

S3 Risk Adjusted

Risk Definitions:



Risk

An uncertain event or condition that, if it occurs, has a positive (opportunity) or negative (threat) effect on a project's objectives.



Threat

Situation or condition that is unfavourable to project.



Opportunity

Situation or condition that is favourable to the project.



Uncertainty

Lack of knowledge about an event that reduces the confidence in conclusions drawn from the data.

S3 Risk Adjusted

Identify/Quantify potential events causing delay/
cost increase to Project

- Incomplete design
- Inadequate site investigation
- Unrealistic schedule/budget
- Permit requirements
- Weather
- Supplier's/contractor's ability to deliver
- Public relations
- Unforeseen conditions...

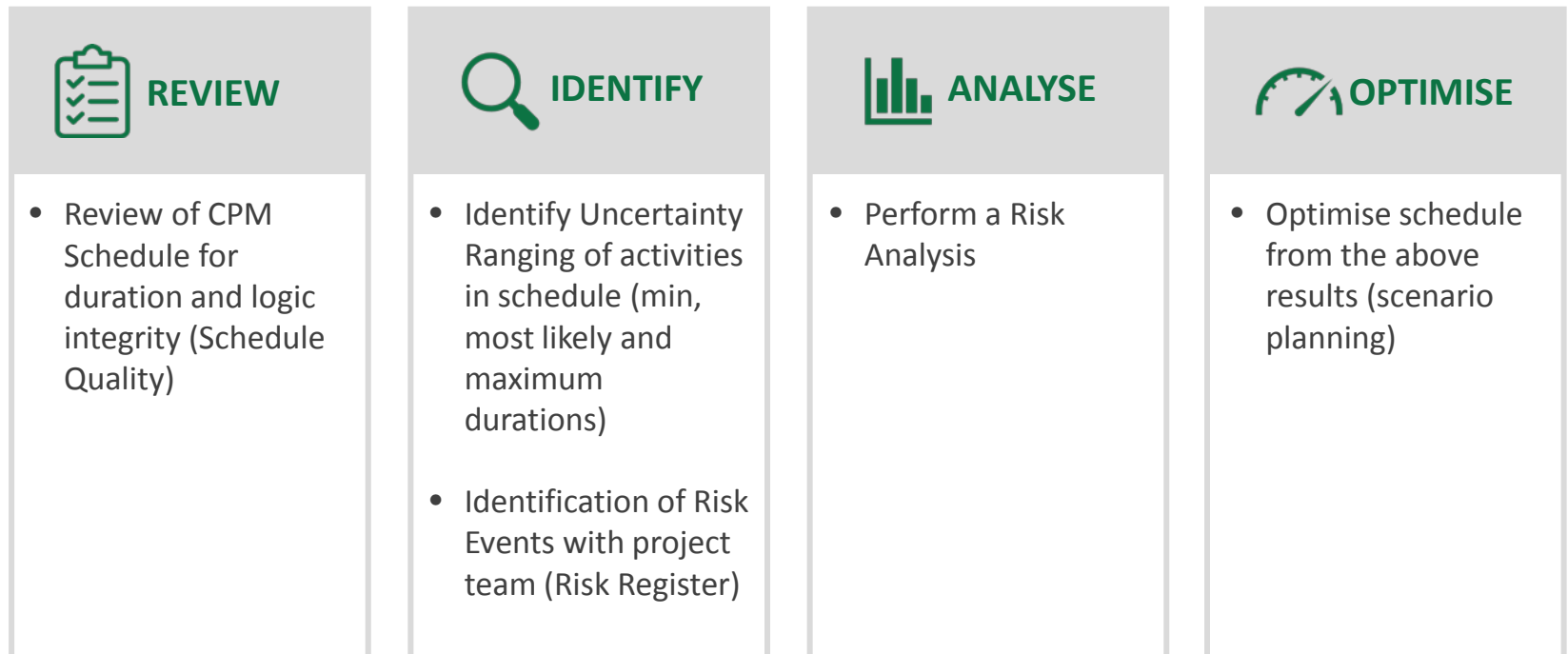
S3 Risk Adjusted

What stage do you need to understand your risks?

- Before entering into a Funding gate
- Before/during Engineering Phase
- Before starting Construction – evaluating competing bids for equipment for example
- How Often? As often as it feels necessary to capture/ evaluate/ mitigate/ eliminate risk affecting ultimate project goal – Completing project
 - Some groups review Portfolio quarterly
 - Some review yearly (ex. LRP cycle)
 - Partner review initiated

S3 Risk Adjusted

The Process:



S4-S5 Optimise/Align

The Process:

SET GOALS

- Setting the Acceleration Goal

DEFINE

- Define Acceleration Criteria**
- **The Action:** What change should be applied during the acceleration.
 - **The Target Set:** Which activity or groups of activities should the rule apply to?
 - **The Priority:** When the acceleration simulation is run, emphasis is inherently around activities that fall on or near the critical path.

GENERATE




- **Generate Scenario** once the goal and criteria have been defined, the simulation can be run.

S4-S5 Optimise/Align

- The Benefit and Return on Investment (ROI) of **Goal-Based Acceleration**
- How Does it Differ from a **Monte-Carlo Simulation**?
- When Should **Schedule Acceleration** Be Carried Out?

Case Study

BOMBARDIER TRANSPORTATION

-  70,000+ employees
-  Headquartered in Canada
-  Multinational manufacturer of planes and trains

Background:

- Large rail modernisation project
- Multiple planners
- Growing number of activities
- Complex logic

Case Study



Requirements:

- **Best Practises** - Implement Scheduling Best Practises and Standards.
- **Targeted Quality Check** – The ability to analyse the quality of each of the sub-projects integrated into the master schedule was key.
- **Internal Customisation** – provide standard checks for schedule quality with an acceptable thresholds that could be amended to meet specific project demands.
- **Clear Communications** – The use of an analyst report highlighted areas of the schedule requiring correction, in a clear and easy-to-understand format. This report should provide an easy means of communicating necessary updates to the project team.

Case Study



Solution: Acumen Fuse

- **Slice and Dice Capability** – Acumen Fuse allows activities to be grouped by a common field or attribute to analyse and compare each segment individually. Drill down into any part of the project to target the weaker parts of the schedule and easily identify necessary improvements.
- **Editable Metrics** – Acumen Fuse metric builder makes creating custom metrics and editing existing metrics, simple. Each metric can be customized (including the thresholds) for use company-wide or project to project.

Case Study



Solution: Acumen Fuse

- **Quick and Efficient Reporting** – Acumen Fuse analyst report is an automatically generated 'to-do list' that allows the scheduler to view problematic activities and make corrections quickly in the native scheduling tool - eliminating time wasted sifting through thousands of activities manually.

Case Study

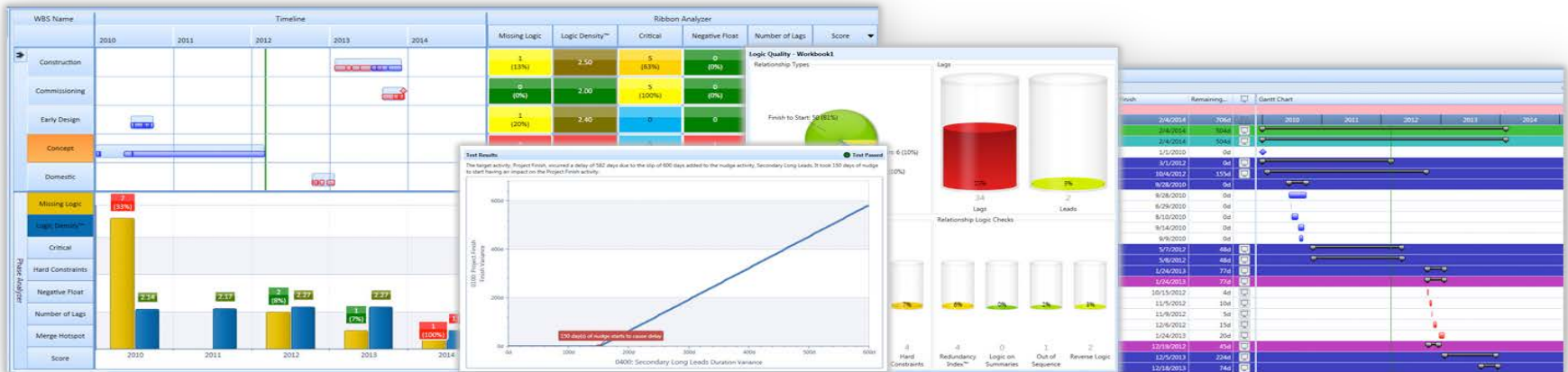


Outcome:

- Bombardier is currently leveraging Acumen Fuse on a high-profile, complex project with over 10,000 activities, involving teams and multiple planners in different countries around the world.
- Acumen Fuse is helping to generate an efficient reporting process and performance tracking method that is providing a clear visual across multiple sub-projects.
- The automated analysis and reporting ensures time-efficient weekly updates and keeps stakeholders in the know.

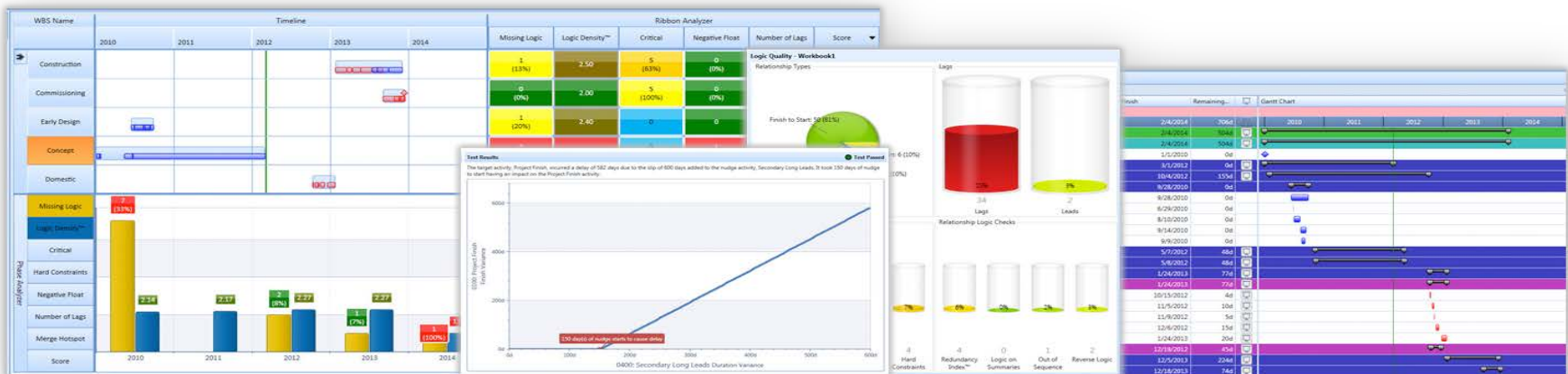
Schedule Diagnostics

- A sound schedule is the key to project success.
- Deltek Acumen diagnoses and resolves schedule shortcomings for the soundest schedules possible.



Deltek Acumen Fuse®

- Depth: Advanced analytics and visualization of project data.
- Customization: Customize analytics and reports to meet specific needs.
- Trending: Track performance during execution.
- Unique Features: Logic analysis, Forensics, Benchmarking and more...
- Unmatched Performance: Complete analysis done in seconds.



Workbook1 - Deltek Acumen

S1 // Projects S2 // Diagnostics S2 // Logic S2 // Benchmarking S3 // Risk S4 // Acceleration S5 // Dashboard Forensics Metrics Fields

Projects Fields Resources Hierarchy Charts Trend Analysis™ Start 1/01/2010- Finish 31/01/2013- Add Phase Reset Dates Charts Charts Apply to All Fuse Compare Trace Show/Hide Other Settings Tabular Heat Map Detailed Gantt Chart To Microsoft Excel® Undock Publish

Phases Intersections Tabs Analyze Logic Display Settings Activity Browser Modes Publish

Project / Snapshot Timeline Ribbon Analyzer

Project / Snapshot	2010	2011	2012	2013	Missing Logic	Logic Density™	Critical	Hard Constraints	Negative Float	Insufficient Detail™	Number of Lags	Number of Leads	Merge Hotspot	Score
Initial Plan.0040 - Detailed Design					0 (0%)	2.83	3 (50%)	2 (33%)	1 (17%)	0 (0%)	6 (100%)	1 (17%)	0 (0%)	0%
Initial Plan.0050 - Procurement					0 (0%)	2.67	3 (50%)	1 (17%)	1 (17%)	0 (0%)	5 (100%)	0 (0%)	1 (17%)	0%
Initial Plan.0080 - Commissioning					0 (0%)	2.00	5 (100%)	0 (0%)	0 (0%)	0 (0%)	1 (20%)	0 (0%)	0 (0%)	80%
Initial Plan.0020 - Early Design					1 (25%)	2.00	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0%
Initial Plan.0030 - FEED					1 (20%)	2.40	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0%
Initial Plan.0060 - Manufacturing					1 (10%)	1.90	5 (50%)	0 (0%)	0 (0%)	0 (0%)	6 (60%)	0 (0%)	0 (0%)	30%
Initial Plan.0070 - Construction					1 (13%)	2.50	5 (63%)	0 (0%)	0 (0%)	0 (0%)	1 (13%)	0 (0%)	0 (0%)	75%
Initial Plan.0010 - Concept					5 (83%)	1.83	2 (33%)	1 (17%)	1 (17%)	0 (0%)	1 (17%)	2 (33%)	0 (0%)	14%

Group activities by a common attribute (WBS/Contractor/Location, etc.)

View the metric results for each grouping or 'Ribbon'.

Missing Logic Logic Density™ Critical Hard Constraints Negative Float Insufficie... Number of Lags Number of Leads Merge Hotspot Score

View the metric results for each time-phase.

Score in Project / Snapshot >= Initial Plan.0040 - Detailed Design (6)

Activity	Missing L...	Critical	Hard Con...	Negative...	Insufficie...	Number...	Number...	Merge H...	Score
Base	✓	○	✓	✓	✓	!	✓	✓	91%
Support	✓	○	✓	✓	✓	!	✓	✓	91%
Topside	✓	○	✓	✓	✓	!	✓	✓	91%
Electrical	✓	○	✓	✓	✓	!	✓	✓	73%
Interfaces	✓	○	✓	✓	✓	!	✓	✓	55%
Communications	✓	○	✓	✓	✓	!	✓	✓	23%
Totals	✓	○	✓	✓	✓	!	✓	✓	0%

Click on any ribbon, phase, or metric to see all activities included.

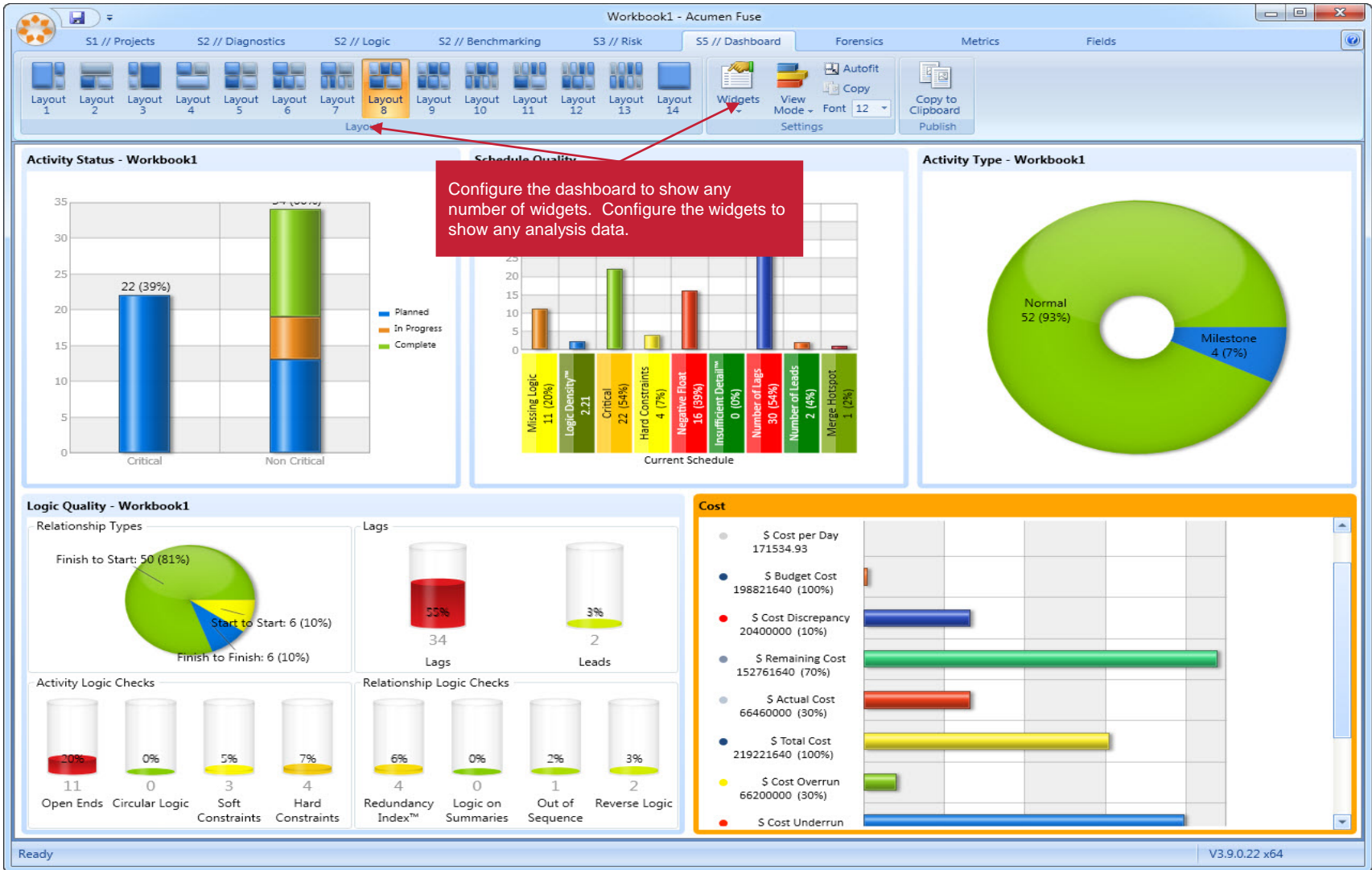
Schedule Quality Characteristics Duration Logic Lags Constraints Float Status Planned In-Progress Completed Baseline Compliance Scenario Comparison Cost Risk Inputs Risk Exposure

Earned Value Earned Value Work Earned Schedule Work / Resources DCMA 14 Point DCMA 14 Point w/EV Method

Select any of these tabs to view different groups of metrics.

Ready VB3.0CU3 x64





Workbook1 - Acumen Fuse

S1 // Projects S2 // Diagnostics S2 // Logic S2 // Benchmarking S3 // Risk S4 // Acceleration S5 // Dashboard Forensics Metrics Fields

Projects Added - Removed Activities Modified Relationships Modified Resource Assignments Modified Calendars Forensic Checks

Description Remaining Duration Finish Late Start Critical Budget Cost Total Cost
 Activity Type Total Float Early Start Late Finish Actual Cost Calendar
 Original Duration Start Early Finish Activity Status Secondary Constraint Remaining Cost More...
 Activity Variances

Projects

- Current Schedule
- Initial Plan
- 1 Month Update
- 6 Month Update

Critical Modifications - 15 (27%)

Identify variances on any attribute or field, even user-defined fields.

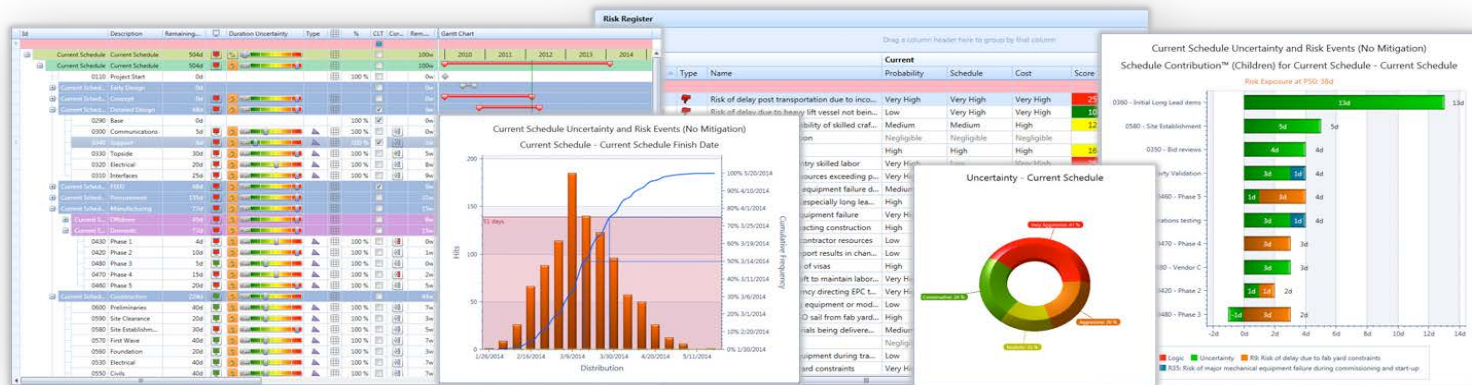
#	ID	Description	Activity Type	Remaining Duration	WBS Name	Current Schedule	Initial Plan	1 Month Update	6 Month Update
WBS Name: Alternate scenario development (2 items)									
1	0160	Bid B review	Normal	0	Alternate scenario development	✗	▲	✓	▲
2	0170	Bid A review	Normal	0	Alternate scenario development	✗	▲	✓	=
WBS Name: Early Design (4 items)									
3	0210	Civil design	Normal	0	Early Design	✗	=	✗	▲
4	0220	Mechanical design	Normal	0	Early Design	✗	=	✗	▲
5	0230	Electrical design	Normal	0	Early Design	✗	=	▲	▲
6	0670	Telecoms Design	Normal	0	Early Design	✗	▬	▲	▲
WBS Name: FEED (2 items)									
7	0270	Review	Normal	0	FEED	✗	=	✗	▲
8	0280	Platform FEED	Normal	0	FEED	✗	=	✗	▲
WBS Name: Detailed Design (5 items)									
9	0290	Base	Normal	0	Detailed Design	✗	=	✗	▲
10	0310	Interfaces	Normal	25	Detailed Design	✗	=	✗	▲
11	0320	Electrical	Normal	20	Detailed Design	✗	▲	✓	▲
12	0330	Topside	Normal	30	Detailed Design	✗	=	✗	▲
13	0340	Support	Normal	6	Detailed Design	✗	=	✗	▲
WBS Name: Procurement (2 items)									
14	0370	Vendor B	Normal	15	Procurement	✓	▼	✗	▼
15	0380	Vendor A	Normal	25	Procurement	✗	▲	✓	▲

The columns show variations between each project being compared.

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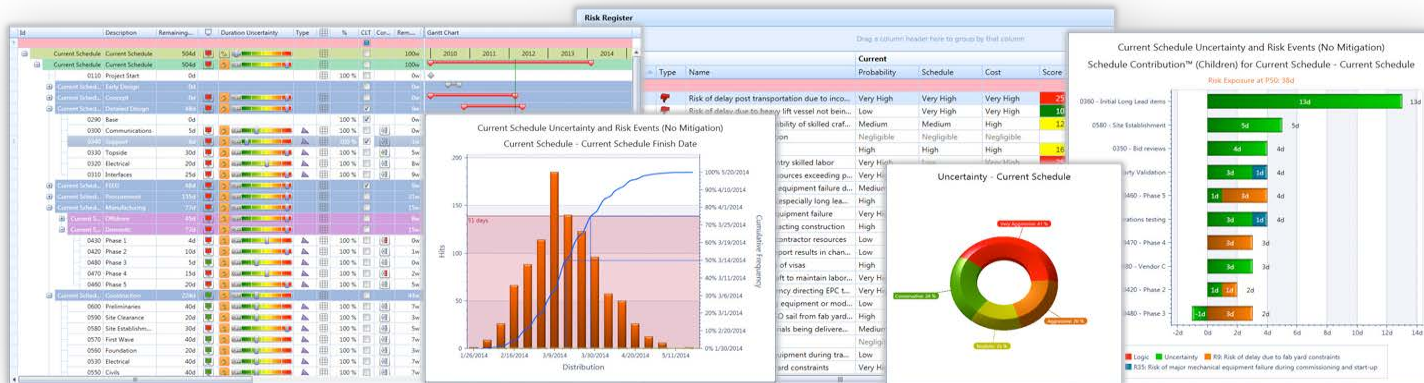
Risk Analysis

- Accurate forecasting requires consideration of risk.
- Proactively identify and reduce cost and schedule risk exposure with Deltek Acumen.



Deltek Acumen Risk™

- Straightforward analysis eliminates the statistical and logical complexities of building risk models
- User-friendly reports provide insight into key risk drivers and high-risk areas of the schedule allowing for targeted mitigation efforts
- Powerful Monte-Carlo engine ensures the up most accuracy and unrivaled analysis performance.



Workbook1 - Acumen Fuse

S1 // Projects S2 // Diagnostics S2 // Logic S2 // Benchmarking S3 // Risk S4 // Acceleration S5 // Dashboard Forensics Metrics Fields

Views: Left Panel, Right Panel, Activities View Mode, Lock / Unlock, Unlock All Children, Gantt Chart Color Scheme, Run Risk Analysis, Adjusted Schedule, Create Scenario, Uncertainty Template, Risk Matrix Template, Publish

Id	Description	Remaining Dura...	Duration Uncertainty
Initial Plan	Initial Plan	1,126	[Progress Bar]
Initial Plan	Initial Plan	1,126	[Progress Bar]
0110	Project Start	0	[Progress Bar]
Initial Plan.0020	Early Design	70	[Progress Bar]
Initial Plan.0030	FEED	137	[Progress Bar]
0280	Platform FEED	10	[Progress Bar]
0270			[Progress Bar]
0260			[Progress Bar]
0250			[Progress Bar]
0240	FEED handover	5	[Progress Bar]
Initial Plan.0010	Concept	249	[Progress Bar]
Initial Plan.0040	Detailed Design	263	[Progress Bar]
0290	Base	20	[Progress Bar]
0340	Support	20	[Progress Bar]
0330	Topside	30	[Progress Bar]
0320	Electrical	45	[Progress Bar]
0300	Communications	5	[Progress Bar]
0310	Interfaces	35	[Progress Bar]
Initial Plan.0050	Procurement	205	[Progress Bar]
Initial Plan.0060	Manufacturing	103	[Progress Bar]
Initial Plan.0...	Offshore	81	[Progress Bar]
0520	Phase 1	5	[Progress Bar]
0510	Phase 2	5	[Progress Bar]
0500	Phase 3	10	[Progress Bar]
0490	Phase 4	15	[Progress Bar]
0410	Phase 5	20	[Progress Bar]
Initial Plan.0...	Domestic	103	[Progress Bar]
Initial Plan.0070	Construction	336	[Progress Bar]
Initial Plan.0080	Commissioning	118	[Progress Bar]
0640	Third Party Validati...	20	[Progress Bar]
0630	Certification	5	[Progress Bar]

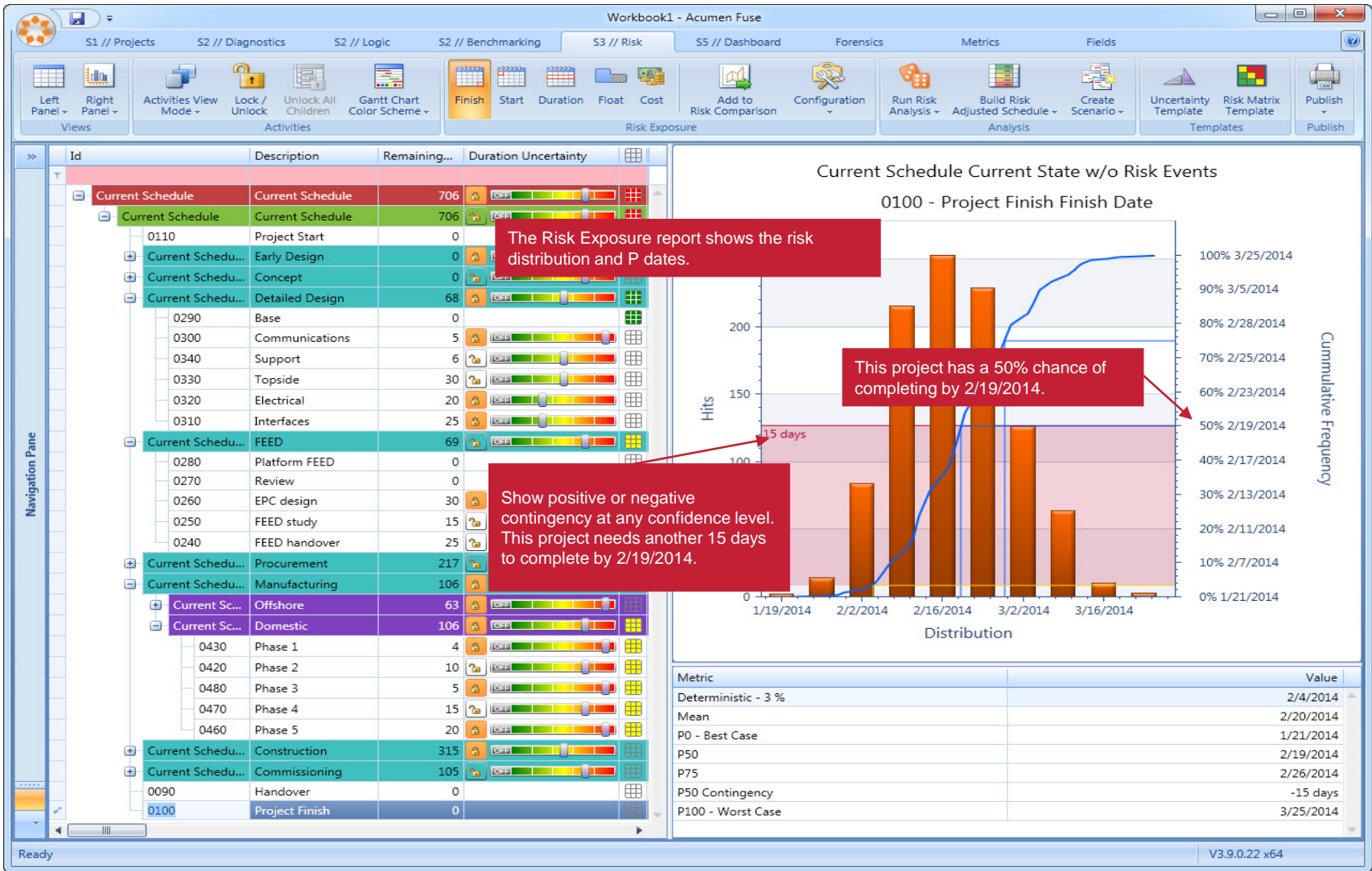
Assign uncertainty values hierarchically.

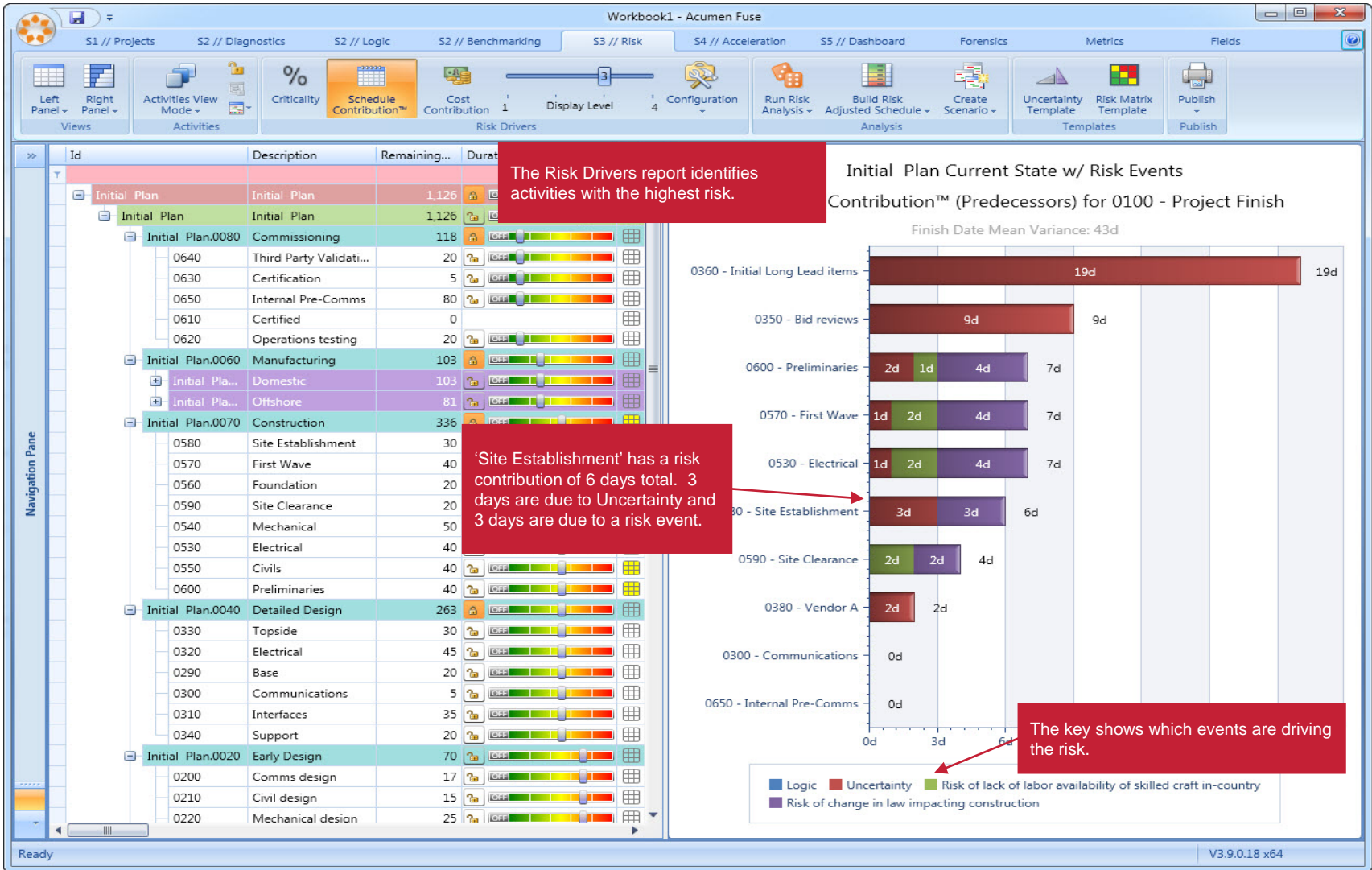
Uncertainty

The Uncertainty report provides insight into how aggressive or conservative the team thinks the project schedule/cost is.

Category	Percentage
Conservative	26 %
Very Conservative	11 %
No Risk	9 %
Realistic	19 %
Aggressive	17 %
Very Aggressive	19 %

Ready V3.9.0.22 x64





Workbook1 - Acumen Fuse

S1 // Projects S2 // Diagnostics S2 // Logic S2 // Benchmarking S3 // Risk S4 // Acceleration S5 // Dashboard Forensics Metrics Fields

Views: Left Panel, Right Panel, Add Risk Event, Delete Risk Event, Run Risk Analysis, Build Risk Adjusted Schedule, Create Scenario, Uncertainty Template, Risk Matrix Template, Publish, Import/Export Risk Register

Initial Plan

Custom Fields: Owner

The integrated risk register allows you to track and manage risks.

Risk		Current				Mitigation				Mitigated				
ID	T...	Name	Probability	Schedule	Cost	S...	Enabled	Description	Dura...	Cost	Probability	Schedule	Cost	Score
Owner: DP														
R3	T	Risk of insufficient in cou...	Very High	Low	Very High	25			0d	\$0	Very High	Low	Very High	25
R37	T	Risk of major dredging e...	Very High	Very High	High	25	<input checked="" type="checkbox"/>	Contract backu	10d	\$1,000,000	Medium	Medium	Low	9
R1	T	Risk of delay post transp...	Very High	Very High	Very High	25	<input checked="" type="checkbox"/>	Ensure no carry	0d	\$5,000,000	Medium	Very High	Very High	15
R36	T	Risks of theft of materials...	High	Very High	High	20			0d	\$0	High	Very High	High	20
R10	T	Risk of delay due to heav...	Low	Very High	Very High	10			0d	\$0	Low	Very High	Very High	10
Owner: IP														
R9	T	Risk of delay due to fab...	Very High	Very High	High	25	<input checked="" type="checkbox"/>	Procure yard ee	0d	\$500,000	Very Low	Very High	High	5
R38	T	Risk of change in law im...	High	Very High	Very High	20	<input checked="" type="checkbox"/>	Liaison with loc	30d	\$0	Medium	Very High	Very High	15
R6	T	Risk of poor quality mate...	Medium	Medium	Low	9				\$0	Medium	Medium	Low	9
R8	T	Risk of damage to key e...	Low	Low	Medium	6				\$0	Medium	Medium	Medium	6
Owner: JW														
R42	T	Risk of inability to hire cr...	Very High	High	Very High	25				\$0	Very High	Very High	Very High	25
R41	T	Risk of delay in approval...	High	Low	Very High	20			0d	\$0	High	Low	Very High	20
R2	T	Risk of customs delays	High	High	High	16			0d	\$0	High	High	High	16
R5	T	Risk of pirates during FP...	High	High	Medium	16			0d	\$0	High	High	Medium	16
R44	T	Risk of Governmental ag...	Very High	Medium	Low	15			0d	\$0	Very High	Medium	Low	15
R45	T	Risk of delays in releasin...	Low	Very High	High	10			0d	\$0	Low	Very High	High	10

Drag a column header here to group by that column

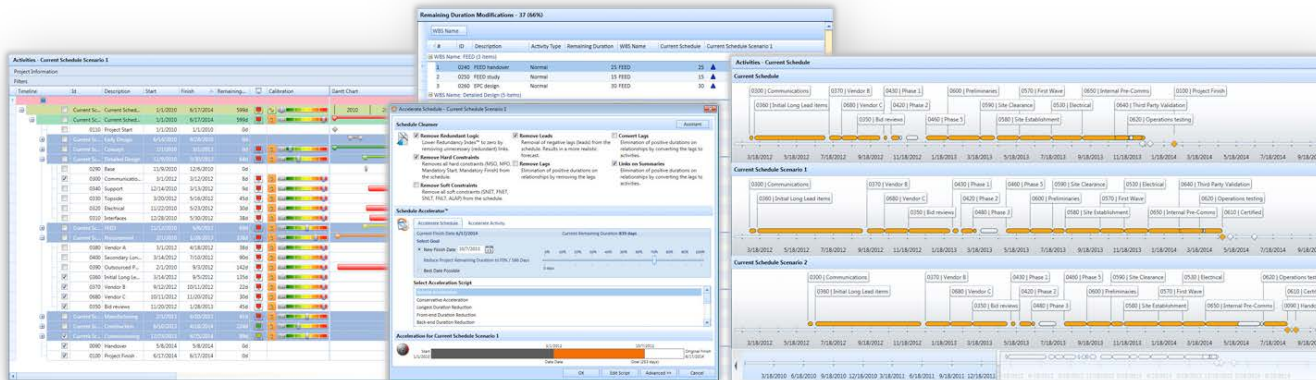
Link		Current		Mitigation		Mitigated		
R...	Activity	Event	Duration	Cost	Duration	Cost	Duration	Cost
<input checked="" type="checkbox"/>	0580: Site Establishment	Risk of lack of labor availability of...	3d	\$2,973,907	0d	\$0	3d	\$2,973,907
<input checked="" type="checkbox"/>	0570: First Wave	Risk of lack of labor availability of...	4d	\$6,100,510	0d	\$0	4d	\$6,100,510
<input checked="" type="checkbox"/>	0560: Foundation	Risk of lack of labor availability of...	2d	\$1,677,457	0d	\$0	2d	\$1,677,457

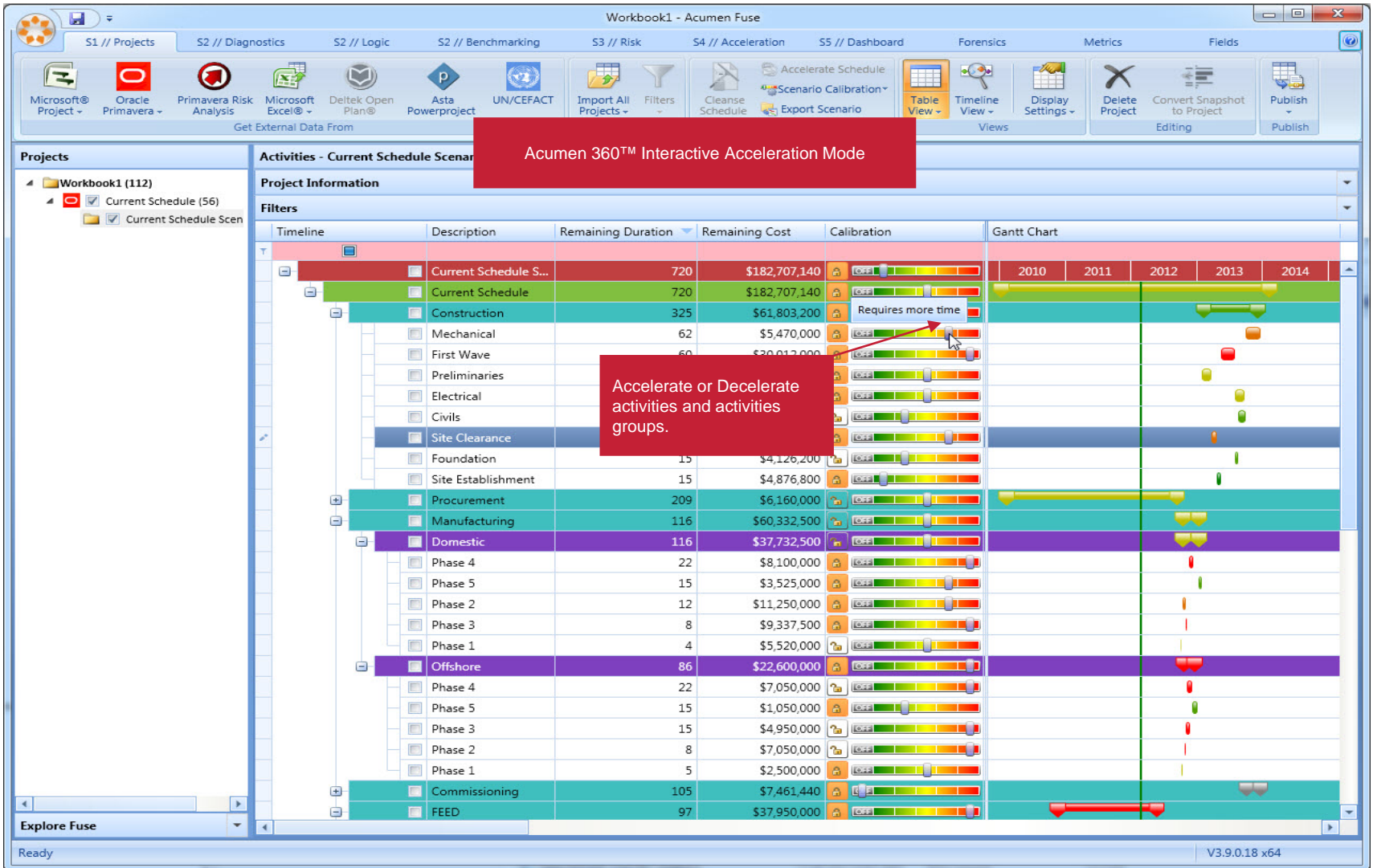
The integrated risk register allows you to track and manage risks.

Ready V3.9.0.18 x64

Optimization

- Delays are all-too prevalent in project management.
- Hypothesize acceleration opportunities or threats of delay and immediately view the impact on key milestones with Deltek Acumen.





Workbook1 - Acumen Fuse

S1 // Projects S2 // Diagnostics S2 // Logic S2 // Benchmarking S3 // Risk S4 // Acceleration S5 // Dashboard Forensics Metrics Fields

Microsoft® Project Oracle Primavera Primavera Risk Analysis Microsoft Excel® Deltek Open Plan® Asta Powerproject UN/CEFACT Import All Projects Filters Cleanse Schedule Accelerate Schedule Scenario Calibration Table View Timeline View Display Settings Delete Project Convert Snapshot to Project Publish

Get External Data From

Projects

- Workbook1 (162)
 - Initial Plan (54)
 - Initial Plan Scenario (54)
 - Initial Plan Scenario 2 (54)

Activities

Project I
Description
Original F
Start
Baseline S
Float Type

Initial P

0170 | B
C
2/1/2010
Initial P
0170 | B
C
2/1/2010
Initial P
0170 | B
C
2/1/2010

Initial P

0170 | B
C
2/1/2010
Initial P
0170 | B
C
2/1/2010

Initial P

0170 | B
C
2/1/2010
Initial P
0170 | B
C
2/1/2010

Explore Fuse

Ready

V3.9.0.22 x64

Accelerate Schedule - Initial Plan

Schedule Cleanser Assistant

- Remove Redundant Logic**
Lower Redundancy Index™ to zero by removing unnecessary (redundant) links.
- Remove Hard Constraints**
Removes all hard constraints (MSO, MFO, Mandatory Start, Mandatory Finish) from the schedule.
- Remove Soft Constraints**
Remove all soft constraints (SNET, FNET, SNLT, FNLT, ALAP) from the schedule.
- Remove Leads**
Removal of negative lags (leads) from the schedule. Results in a more realistic forecast.
- Remove Lags**
Elimination of positive durations on relationships by removing the lags.
- Convert Lags**
Elimination of positive durations on relationships by conversion.

1
Optionally cleanse the schedule.

Schedule Accelerator™

Accelerate Schedule Accelerate Activity

Current Finish Date: 1/31/2013 Current Remaining Duration: 1,126 days

Select Goal

- New Finish Date** 11/2/2011 15
Reduce Project Remaining Duration to 60% / 671 Days
- Best Date Possible**

0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%
0 days

2
Define the project finish goal and let Acumen 360 generate an accelerated scenario to meet this goal..

Select Acceleration Script

- Normal Acceleration
- Conservative Acceleration
- Longest Duration Reduction
- Front-end Duration Reduction
- Back-end Duration Reduction

Acceleration for Initial Plan

2010 11/2/2011
Start 1/1/2010 Original Finish 1/31/2013
Date Goal (456 days)

OK Edit Script Advanced >> Cancel

0102 5/1/2012 7/1/2012 9/1/2012 11/1/2012 1/1/2013
0640 | Third Party Validation
0630 | Certification
0640 | Third Party Validation
0090 | Handover
0102 5/1/2012 7/1/2012 9/1/2012 11/1/2012 1/1/2013

Workbook1 - Acumen Fuse

S1 // Projects S2 // Diagnostics S2 // Logic S2 // Benchmarking S3 // Risk S4 // Acceleration S5 // Dashboard Forensics Metrics Fields

Apply Existing Script Library Merge Existing Script Library Save Script Library as Template Create Script Remove Script Create Step Remove Step Create Filter Set Accelerate Schedule Acceleration

Script Library

- Normal Acceleration
- Conservative Acceleration
- Longest Duration Reduction
- Front-end Duration Reduction
- Back-end Duration Reduction
- Lag-based Acceleration
- Constraint Removal Only
- Constraint Removal and Duration Reduction
- Extreme Acceleration
- Planned Activity Acceleration

Script Editor - Normal Acceleration

Name: Normal Acceleration
 Description: Reduce activity durations by no more than 50%

Step 1: Remove Hard Constraints (Remove Hard Constraints)

Step 2: Acceleration Construction (Reduce Remaining Duration by 50%)

Add criteria and filters for a more targeted acceleration.

Step Library

- Reduce Duration by up to 20%
- Reduce Long Durations by up to 50%
- Remove all Constraints
- Remove Soft Constraints
- Reduce Duration by up to 50%
- Remove Hard Constraints
- Reduce Start of Project Activity Durations
- Reduce End of Project Activity Durations
- Reduce Predecessor Lag by 50%
- Reduce Successor Lag by 50%
- Reduce Duration by up to 100%
- Reduce Planned Activities Only
- Acceleration Construction

Step Editor - Acceleration Construction

Name: Acceleration Construction
 Action: Reduce Remaining Duration 50 % Easiest First

New Filter Set

Field	Op	Field or Value
WBS	=	Initial Plan.0070 Construction

Add Remove

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Thank You

