OR-AS Operations Research Applications and Solutions	Case Name: **Family Day**	Sector	Event Management
	OR-AS Operations Research - Applications and Solutions www.or-as.be info@or-as.be	Baseline Schedule	Schedule with resources Schedule with costs
		Risk Analysis	Random simulation One of nine std. scenarios User defined distributions
Submitted by	Raphael Seffers		
Date	December 14, 2011	Project Control	Automatic tracking Tracking based on user input
File Name	C2011-03 Family Day.p2x		

1. Project description

Project authenticity

The planning of a company family day from the first appointment with the clients to the actual event.

The project consists of activity, resource and cost data that were created by the user.

2. Project properties

2.1. Baseline Schedule

General	
# Activities	22
Planned Duration (PD)	97 days*
Budget At Completion (BAC)	31.675 €
Renewable Resources	2
Consumable Resources	-

Network topology	
Serial/Parallel (SP)	33%
Activity Distribution (AD)	48%
Length of Arcs (LA)	7%
Topological Float (TF)	19%

* standard eight-hour working days

2.2. Risk Analysis

Random simulation by ProTrack was performed using the default symmetric triangular risk distribution profiles.

	Cost sensitivity		
	avg [%]	std dev [%]	skew [-]
CRI-r	18.1	15.1	0.8
CRI-rho	17.8	14.2	0.8
CRI-tau	12.0	9.9	1.0

	Resource sensitivity		
	avg [%]	std dev [%]	skew [-]
CRI-r	61.0	38.0	N/A
CRI-rho	60.0	39.0	N/A
CRI-tau	54.0	36.0	N/A

	Time sensitivity		
	avg [%]	std dev [%]	skew [-]
CI	36.4	48.1	0.6
SI	56.0	37.0	0.1
SSI	12.0	20.1	1.5
CRI-r	16.0	15.5	1.6
CRI-rho	15.9	15.0	1.5
CRI-tau	14.2	11.0	0.9

2.3. Project Control

2.3.1. Simulated forecasting accuracy

The accuracy of time and cost forecasting methods has been evaluated based on Monte Carlo simulation runs using the risk profiles described in section “2.2. Risk Analysis”. Based on these risk profiles, the Mean Absolute Percentage Error (MAPE) and Mean Percentage Error (MPE) have been calculated to evaluate the expected accuracy of the time and cost predictions, EAC(t) and EAC, respectively.

Simulated EAC(t) accuracy		
method - PF	MAPE [%]	MPE [%]
PV - 1	16.2	-0.3
PV - SPI	17.8	8.5
PV - SCI	17.9	8.5
ED - 1	22.3	9.1
ED - SPI	17.8	8.5
ED - SCI	17.8	8.4
ES - 1	10.1	0.4
ES - SPI(t)	16.1	8.1
ES - SCI(t)	16.2	8.0

Simulated EAC accuracy		
method (PF)	MAPE [%]	MPE [%]
1	0.2	0.0
CPI	0.5	0.0
SPI	7.4	7.2
SPI(t)	11.2	10.4
SCI	7.6	7.2
SCI(t)	11.4	10.4
0.8 CPI + 0.2 SPI	2.0	1.8
0.8 CPI + 0.2 SPI(t)	3.2	2.8

According to the MAPE values[1] the best performance for time forecasting can be expected from the unweighted Earned Schedule method. For cost forecasting the unweighted and CPI-weighted methods should yield the best results.

2.3.2. Tracking description

The user has not performed any project control and therefore no tracking periods have been defined. Tracking periods can now be generated automatically by ProTrack or by manually inputting tracking data period by period.

[1] The MAPE gives the best indication for the forecast accuracy (the lower the MAPE, the more accurate the method) since all deviations from the targeted real duration (real cost) are cumulated, whereas for the MPE underestimates can be compensated by overestimates and vice versa, possibly leading to an overly positive evaluation of a certain method. However, the MPE can provide useful information about the nature of the deviations, i.e. does the method rather underestimate or overestimate the real duration (real cost)?