OR-AS Operations Research Applications and Solutions	Case Name: **Commercial IT Project**	Sector	IT (Software Development)
	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	Simon Buysse		
Date	December 21, 2011	Project Control	Automatic tracking Tracking based on user input
File Name	C2011-09 Commercial IT Project.p2x		

1. Project description

Project authenticity

The complete developing process of a software program for magazine publishers, including a preliminary market analysis.

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

2. Project properties

2.1. Baseline Schedule

General	
# Activities	41
Planned Duration (PD)	57 days*
Budget At Completion (BAC)	33.623 €
Renewable Resources	8
Consumable Resources	-

Network topology	
Serial/Parallel (SP)	52%
Activity Distribution (AD)	42%
Length of Arcs (LA)	8%
Topological Float (TF)	24%

* 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	9.7	14.3	2.2
CRI-rho	30.8	20.1	-0.1
CRI-tau	53.4	40.1	0.2

	Resource sensitivity		
	avg [%]	std dev [%]	skew [-]
CRI-r	28.6	21.9	0.9
CRI-rho	28.0	23.5	0.9
CRI-tau	20.4	14.5	0.8

	Time sensitivity		
	avg [%]	std dev [%]	skew [-]
CI	57.2	47.2	-0.3
SI	77.8	30.9	-1.2
SSI	6.7	13.9	3.5
CRI-r	11.6	15.1	2.4
CRI-rho	26.9	19.6	0.5
CRI-tau	44.2	37.6	0.7

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	2.3	0.7
PV - SPI	3.5	0.9
PV - SCI	3.7	1.0
ED - 1	3.1	1.6
ED - SPI	3.4	0.8
ED - SCI	3.5	0.8
ES - 1	4.1	-2.9
ES - SPI(t)	24.6	-22.5
ES - SCI(t)	24.6	-22.5

Simulated EAC accuracy		
method (PF)	MAPE [%]	MPE [%]
1	0.7	-0.3
CPI	0.7	-0.3
SPI	2.0	-0.2
SPI(t)	20.9	-19.7
SCI	2.0	-0.2
SCI(t)	20.9	-19.7
0.8 CPI + 0.2 SPI	0.9	-0.1
0.8 CPI + 0.2 SPI(t)	2.7	-2.3

According to the MAPE values[1] the best performance for time forecasting can be expected from the unweighted Planned Value method. For cost forecasting the unweighted and CPI-weighted methods, or even the method using the composite performance factor with SPI, 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)?