

	Case Name: Social Housing Kortrijk	Sector	Construction (Residential Building)
	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
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File Name	C2011-02 Social Housing Kortrijk.p2x	Project Control Automatic tracking Tracking based on user input	

1. Project description

Project authenticity

A social housing project in the area of Kortrijk (Belgium) comprising the construction of two similar apartment blocks consisting of respectively five and four floors. The focus lies on the construction of the shell.

The project consists of activity and resource data that were obtained directly from the actual project owner and cost data that were created by the user.

2. Project properties

2.1. Baseline Schedule

General	
# Activities	113
Planned Duration (PD)	276 days*
Budget At Completion (BAC)	366.457 €
Renewable Resources	2
Consumable Resources	-

* standard eight-hour working days

Network topology	
Serial/Parallel (SP)	42%
Activity Distribution (AD)	29%
Length of Arcs (LA)	12%
Topological Float (TF)	14%

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	9.3	8.6	2.0
CRI-rho	13.3	12.2	1.8
CRI-tau	23.7	22.4	2.0

	Time sensitivity		
	avg [%]	std dev [%]	skew [-]
CI	43.8	47.4	0.2
SI	12.8	27.0	2.5
SSI	2.5	9.6	8.8
CRI-r	9.8	10.3	4.9
CRI-rho	10.0	10.5	4.4
CRI-tau	21.1	15.2	0.6

	Resource sensitivity		
	avg [%]	std dev [%]	skew [-]
CRI-r	56.0	44.0	N/A
CRI-rho	53.5	46.5	N/A
CRI-tau	50.0	45.0	N/A

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	-1.5
PV - SPI	9.0	6.8
PV - SCI	9.6	7.4
ED - 1	2.5	-0.2
ED - SPI	9.0	6.8
ED - SCI	9.2	7.0
ES - 1	2.2	-1.5
ES - SPI(t)	4.5	2.3
ES - SCI(t)	4.8	2.5

Simulated EAC accuracy		
method (PF)	MAPE [%]	MPE [%]
1	0.8	-0.5
CPI	1.5	-0.3
SPI	8.4	7.5
SPI(t)	4.1	3.5
SCI	8.7	7.7
SCI(t)	4.6	3.8
0.8 CPI + 0.2 SPI	2.9	2.1
0.8 CPI + 0.2 SPI(t)	1.7	0.7

According to the MAPE values¹ the best performance for time forecasting can be expected from one of the three unweighted methods. For cost forecasting the unweighted method should also 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)?