PMI Belgium University Contest

- This presentation is made by the six winners of the PMI Belgium University Contest, edition 2015.
- The winners have been nominated by a jury from PMI Belgium for the best group assignment for the course “Project Management” given by Mario Vanhoucke at the Faculty of Economics and Business Administration of Ghent University.
- More information on this contest can be found in the paper “PMI Belgium's recognition of young PM potential” published in the Journal of Modern Project Management (cf. http:// www.or-as.be/blog/jmpm_2014c).
- Congratulations to the winners!

- Mario Vanhoucke

Dynamic scheduling of a new project: building wireless smart cities

Camille De Cock
Ellen Dekoning
Adeline Dewaele
Miguel García Casado
Jessica Seurinck
Ann-Sophie Tytgat

INDEX

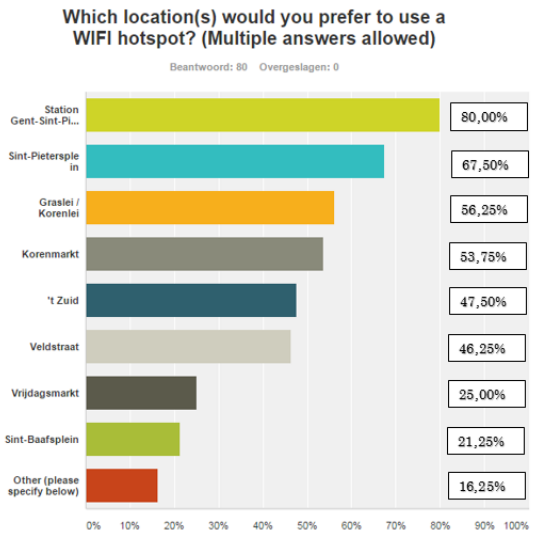
- Why this project?
- Survey Results
- Activities – Baseline Schedule
- Critical Chain Management
- Risk Analysis
- Earned Value Management
- Conclusion

Why this project?

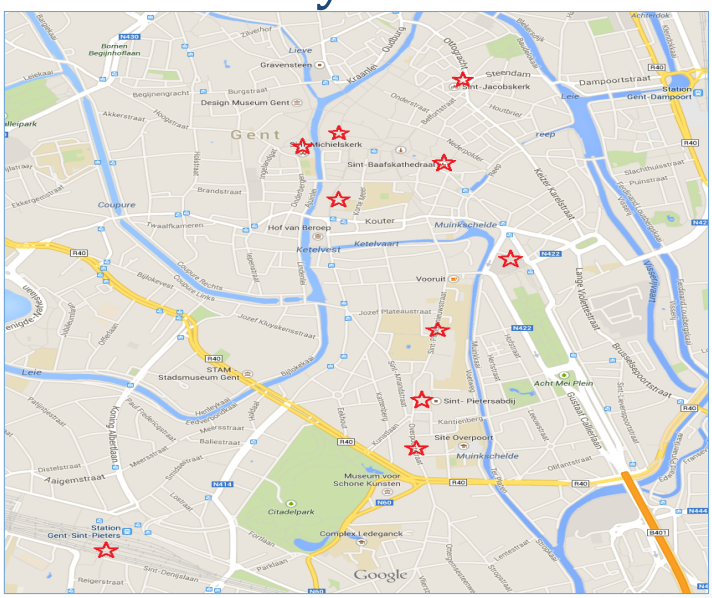
- Innovative project
- Gowex examples

- Original approach

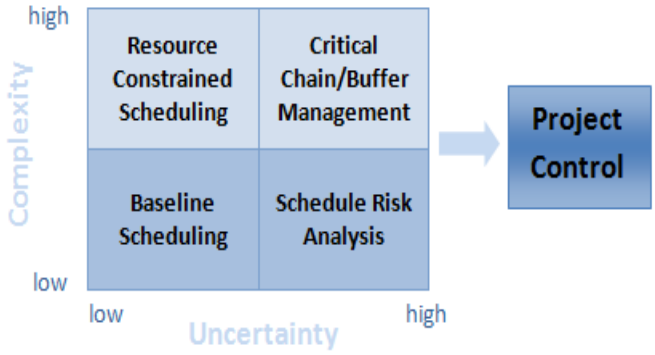
Survey Results

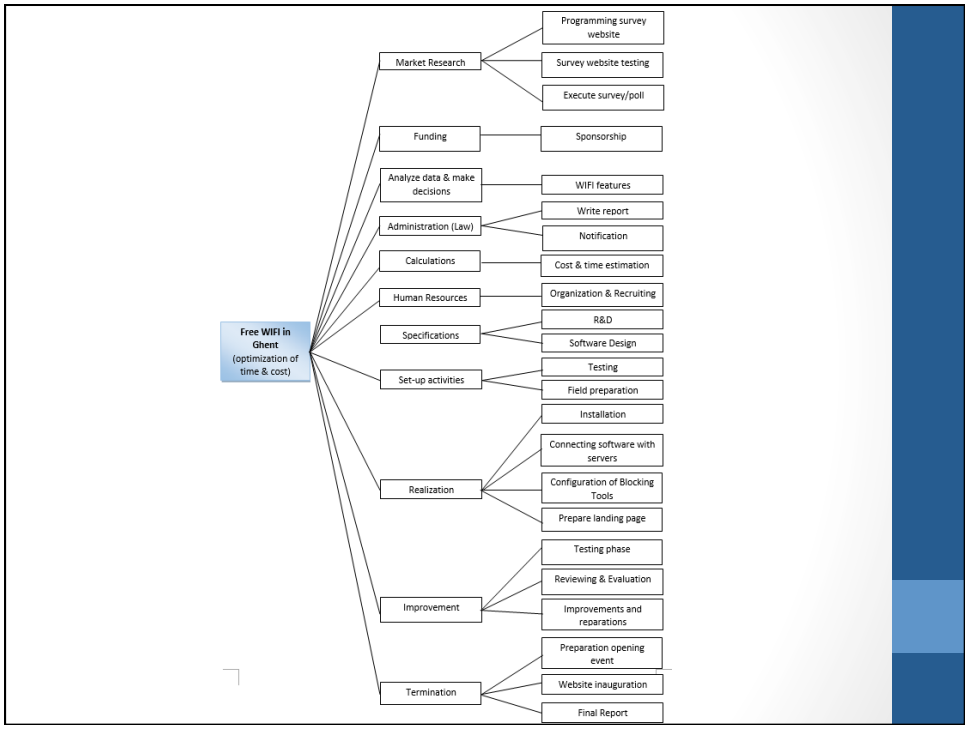


Survey Results



Project Map


high
Complexity
low
Resource Constrained Scheduling
Critical Chain/Buffer Management
Baseline Scheduling
Schedule Risk Analysis
Project Control
low
Uncertainty
high


Free WIFI in Ghent (optimization of time & cost)
Market Research
Programming survey website
Survey website testing
Execute survey/poll
Funding
Sponsorship
Analyze data & make decisions
WIFI features
Administration (Law)
Write report
Notification
Calculations
Cost & time estimation
Human Resources
Organization & Recruiting
Specifications
R&D
Software Design
Set-up activities
Testing
Field preparation
Realization
Installation
Connecting software with servers
Configuration of Blocking Tools
Prepare landing page
Improvement
Testing phase
Reviewing & Evaluation
Improvements and reparations
Termination
Preparation opening event
Website inauguration
Final Report

Activity Schedule

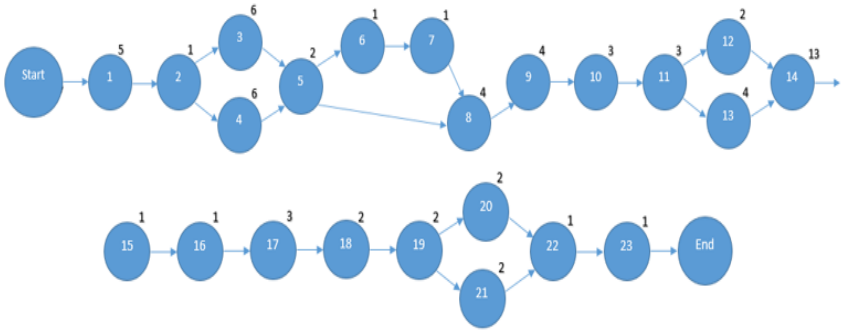
	Activity	Duration (in weeks)	#Resources	Resources	Fixed Cost estimation (€)
1 Start: week 1	Programming survey website	5			800
2 Start week 6	Survey website testing	1			100
3 Start Week 7	Survey/Poll	6			1750
4 Start week 7	Sponsorship	6	4	Public relation	13804,80
5 Start week 13	Definition WIFI features	2	2	System analyst	3124,80
6 Start week 15	Writing report for administration	1	2	Administrative worker	1050,40
7 Start week 16	Notification for administration	1	1	Administrative worker	525,20
8 Start week 15	Cost estimation	4	4	2 Administrative workers 2 System analyst	10451,20
9 Start week 19	Organization and recruiting	4	2	HR manager	5001,60
10 Start week 23	General R&D / Acquire software skills to implement WIFI	3			1200
11 Start week 26	Software design	3	4	Software engineer	17980,80
12 Start week 29	Testing software phase	2	2	Software tester	2113,60

Activity Schedule

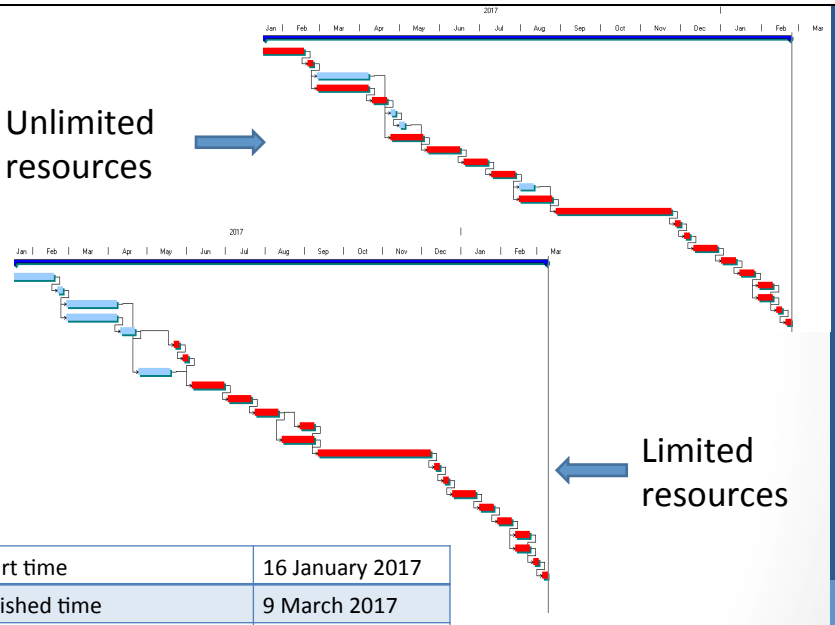
13 Start week 29	Field preparation	4			722271,08
14 Start week 33	Installation	13		10 hotspots	234881,02
15 Start week 46	Connecting software with servers	1	1	Software engineer	1498,80
16 Start week 47	Configuration of blocking tools	1	1	Software engineer	1498,80
17 Start week 48	Programming landing page	3			600
18 Start week 51	Testing phase for the landing phase	2			100
19 Start week 53	Reviewing and evaluation	2	1	System analyst	1562,40
20 Start week 55	Place improvements and reparations	2	2	Technician	2113,60
21 Start week 55	Preparation of opening event	2	1	Marketing specialist	2480
22 Start week 57	Website inauguration	1			9556
23 Start week 58	Final report	1	2	Administrative worker	1050,40

Baseline Schedule

- Project Life Cycle



- Our project is composed of 23 different activities



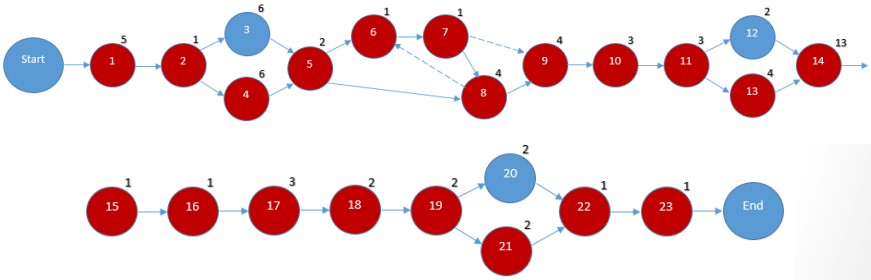
Unlimited resources

Limited resources

Start time	16 January 2017
Finished time	9 March 2017
Planned duration (PD)	60 weeks
Budget at completion (BAC)	€ 383.400, 13

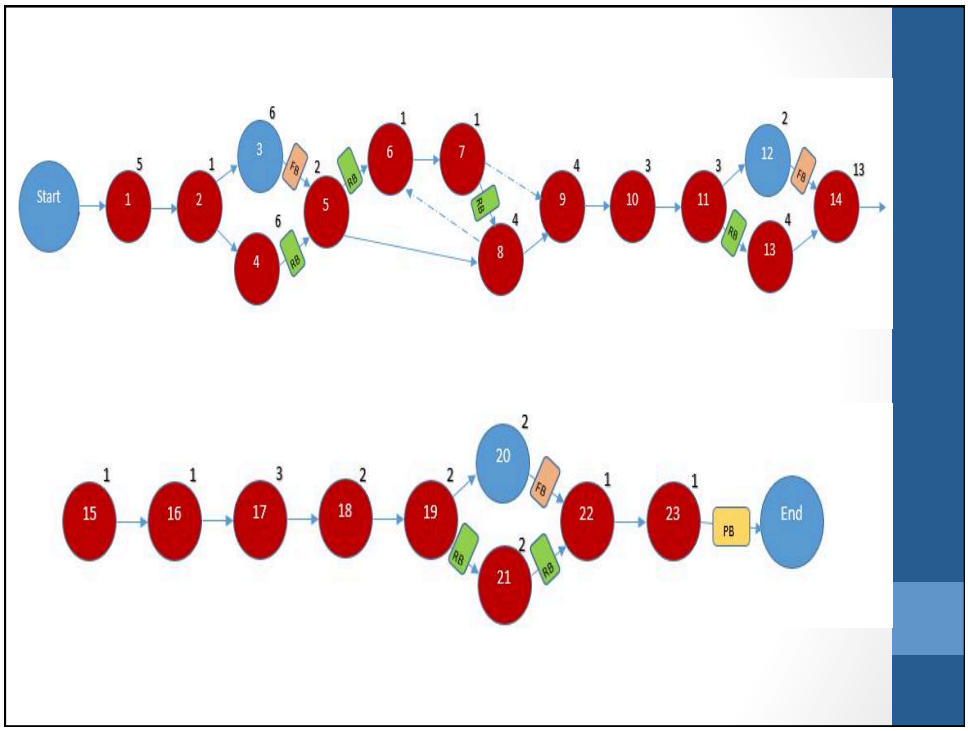
Critical Chain

- Critical Chain: the longest chain of activities which considers resources and also technological dependencies



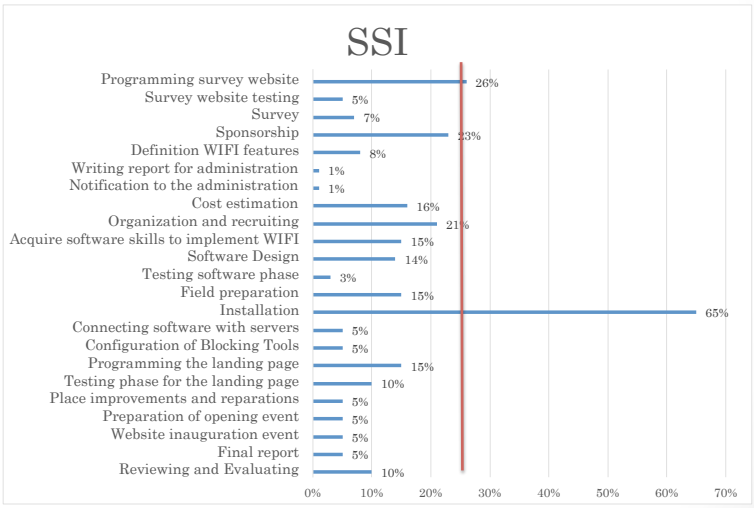
Buffer Management

- Resource buffer: information tool to alert the project manager and performing resources of the impending necessity to work on a CC activity
- Project buffer: transfers the safety time for individual activities to the end of the project
- Feeding buffer: inserted where a non CC activity feeds into a CC activity

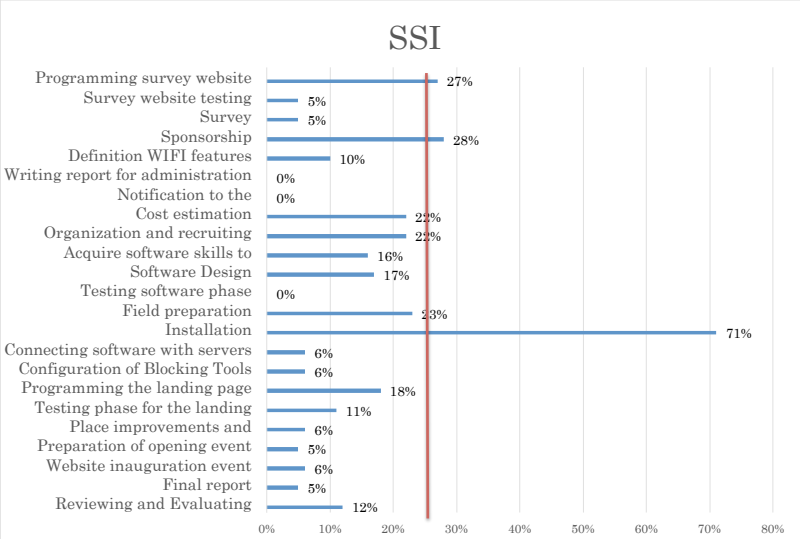


Risk Analysis

Best-case



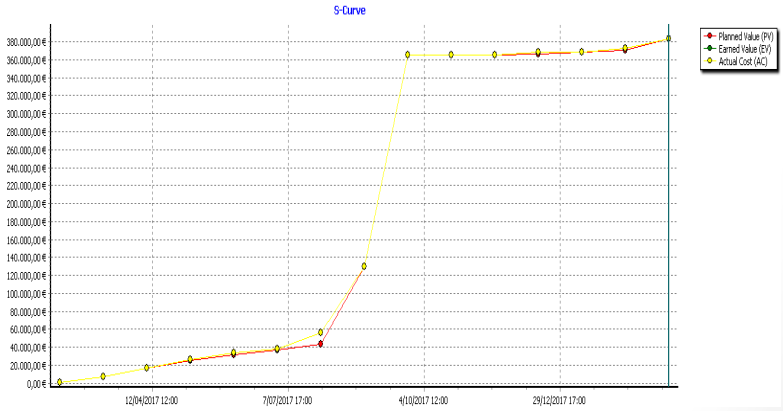
Worst-case



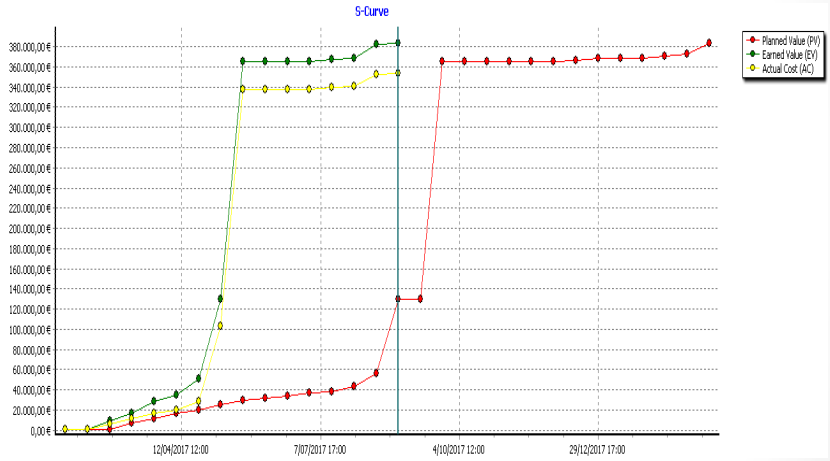
Project control - EVM

- Earned value key metrics (Planned value, Actual cost, Earned value)

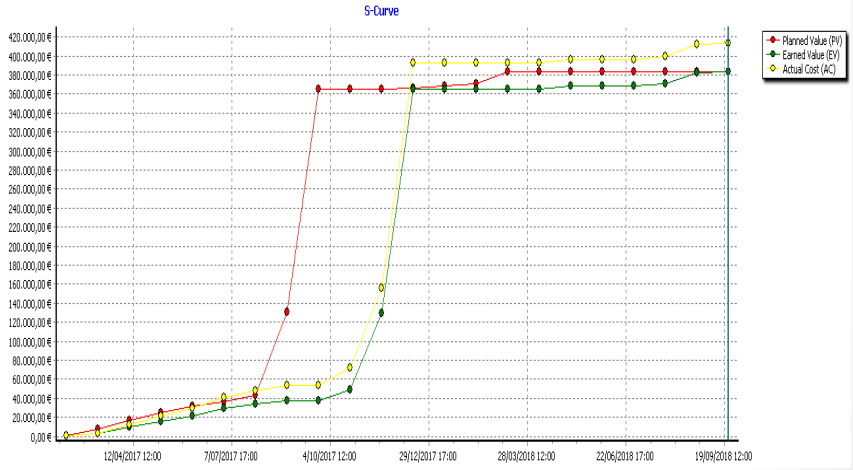
Neutral-case



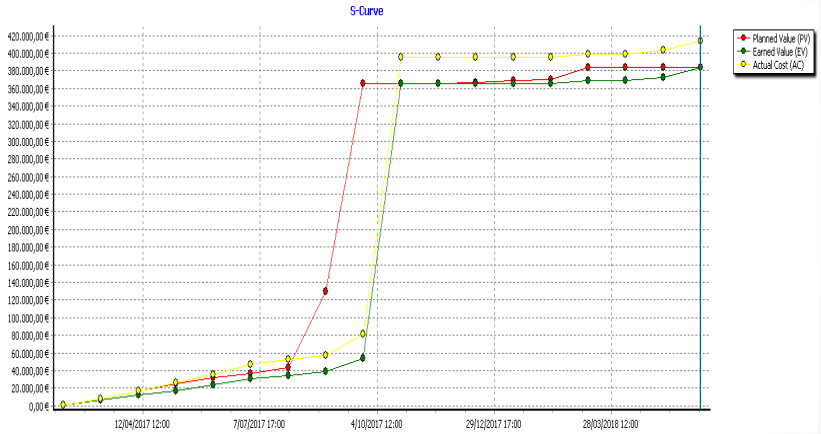
Best-case



Worst-case

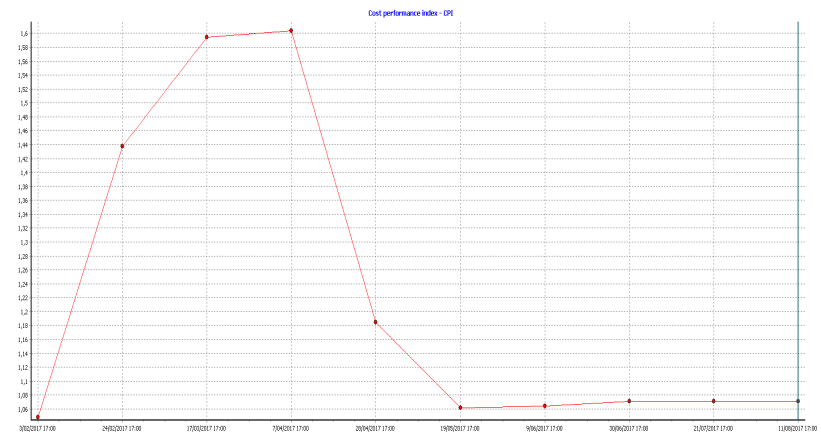


Random-case

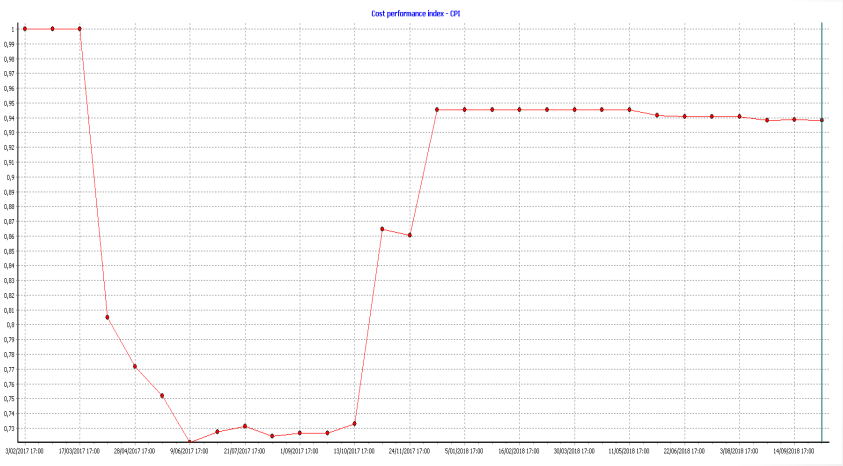


- Performance Measurement
  - Cost Performance Index

Best-case



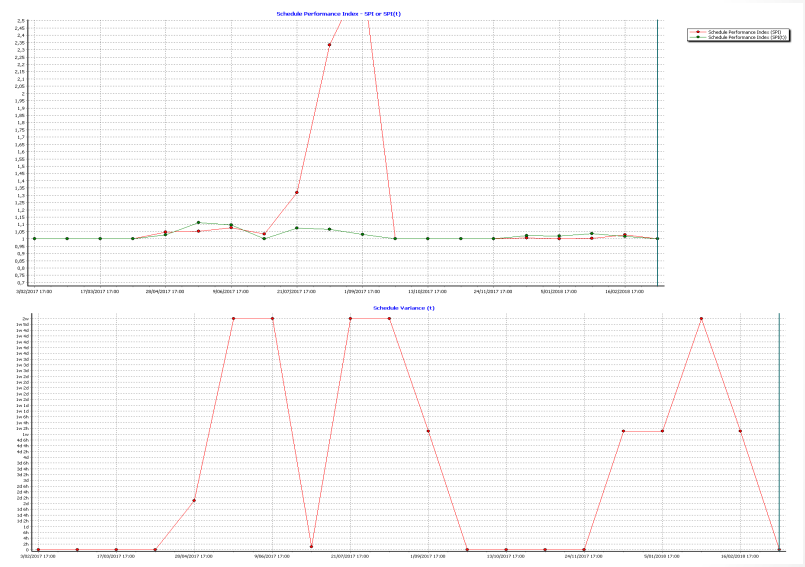
Worst-case



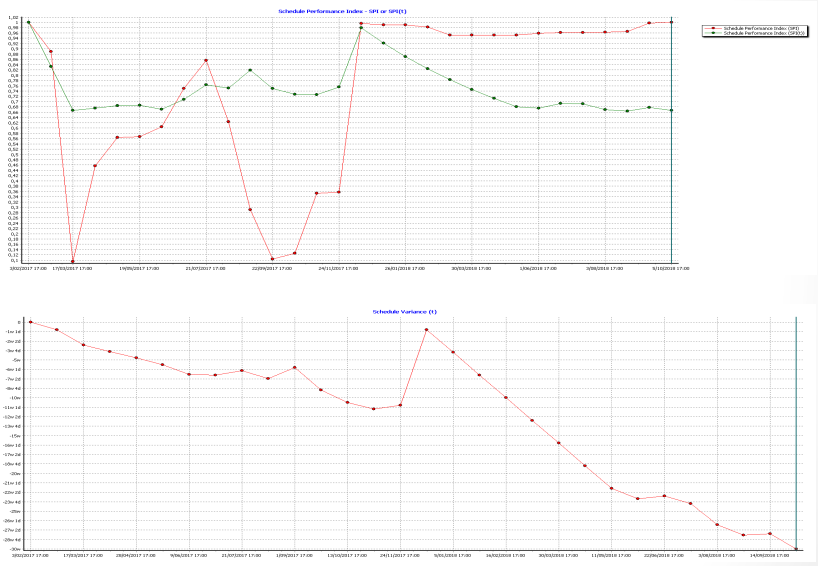
➢ Schedule Performance Index(t) & Schedule Variance(t)

Best-case

Neutral-case



Worst-case



- Earned value forecasting indicators
  - Time forecasting

Best-case	Planned Value Method	Earned Duration Method	Earned Schedule Method
PF=1	16/03/2017 (14:00)	16/03/2017 (14:00)	13/03/2017 (15:00)
PF=SPI (SPI(t))		16/03/2017 (14:00)	27/03/2017 (14:00)
PF=SCI (SCI(t))	11/08/2017 (17:00)	11/08/2017 (17:00)	11/08/2017 (17:00)

Neutral-case	Planned Value Method	Earned Duration Method	Earned Schedule Method
PF=1	09/03/2018 (17:00)	09/03/2018 (17:00)	09/03/2018 (17:00)
PF=SPI (SPI(t))	09/03/2018 (17:00)	09/03/2018 (17:00)	09/03/2018 (17:00)
PF=SCI (SCI(t))	09/03/2018 (17:00)	09/03/2018 (17:00)	09/03/2018 (17:00)

Worst-case	Planned Value Method	Earned Duration Method	Earned Schedule Method
PF=1	09/03/2018 (17:00)	09/03/2018 (17:00)	06/04/2018 (16:00)
PF=SPI (SPI(t))	05/10/2018 (17:00)	05/10/2018 (17:00)	05/10/2018 (17:00)
PF=SCI (SCI(t))	05/10/2018 (17:00)	05/10/2018 (17:00)	05/10/2018 (17:00)

Conclusion