

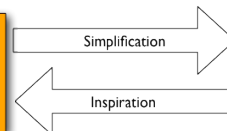
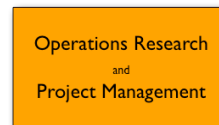
Operations Research and dynamic project scheduling

When research meets practice

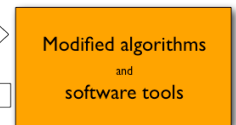
Mario Vanhoucke

Ghent University
Vlerick Leuven Gent Management School
University College London
OR-AS Operations Research - Applications and Solutions
www.or-as.be

Academic Research



Practical applications



Mario Vanhoucke (PhD)

Academic career: Ghent University (Belgium) and University College London (UK)
Vlerick Business School (Belgium, Russia, China)

Professional career: Director EVM Europe
Partner OR-AS (Belgium)

The academic world

The real world





RESEARCH meets PRACTICE



The academic world

The real world

RESEARCH

PRACTICE

Ghent University
University College

Vlerick
Business School

EVM Europe

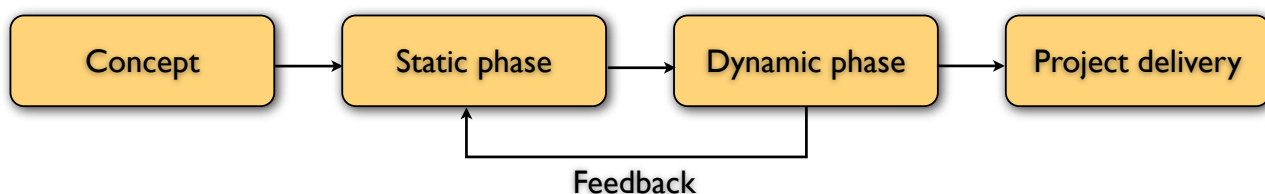
Company
Training

My own consultancy
company

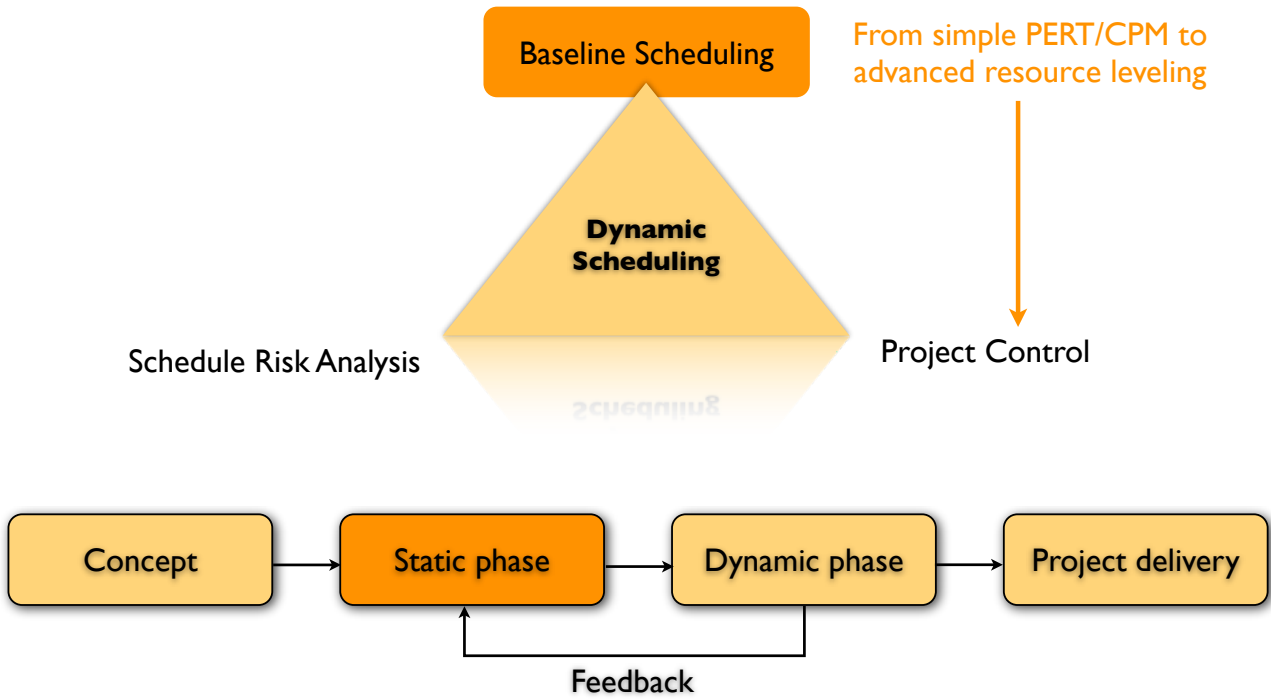
Project Life Cycle

Topic of this presentation

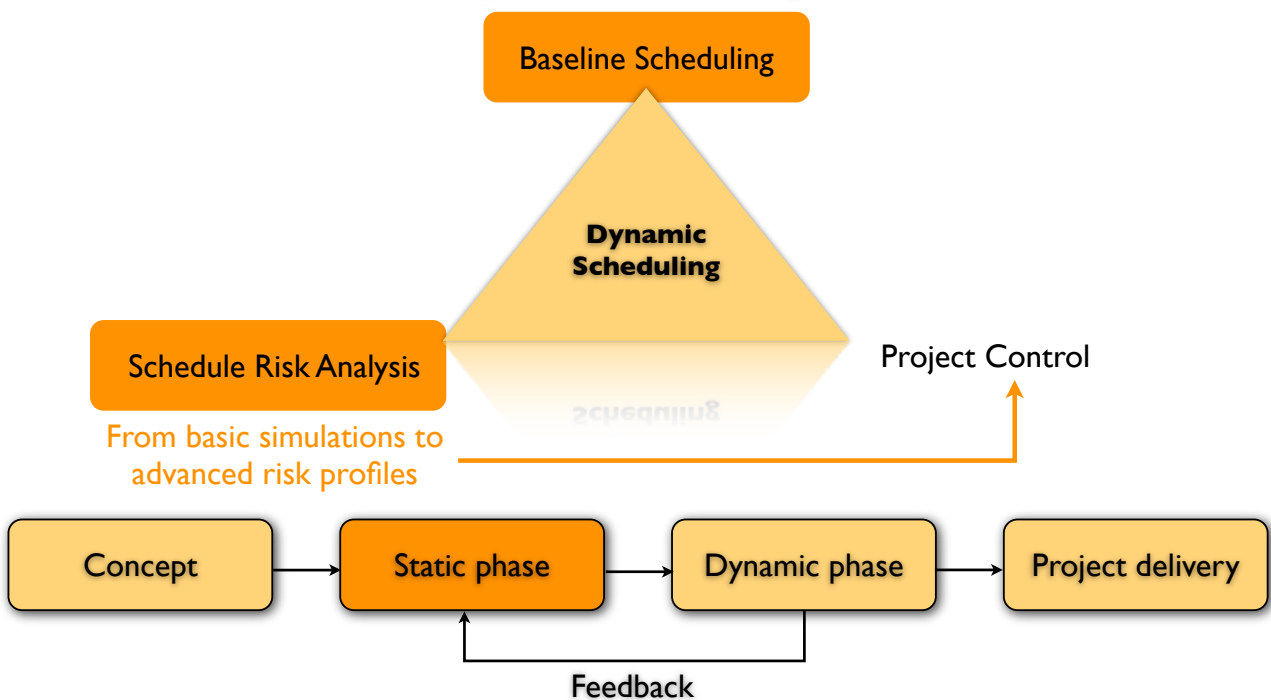
Project Management



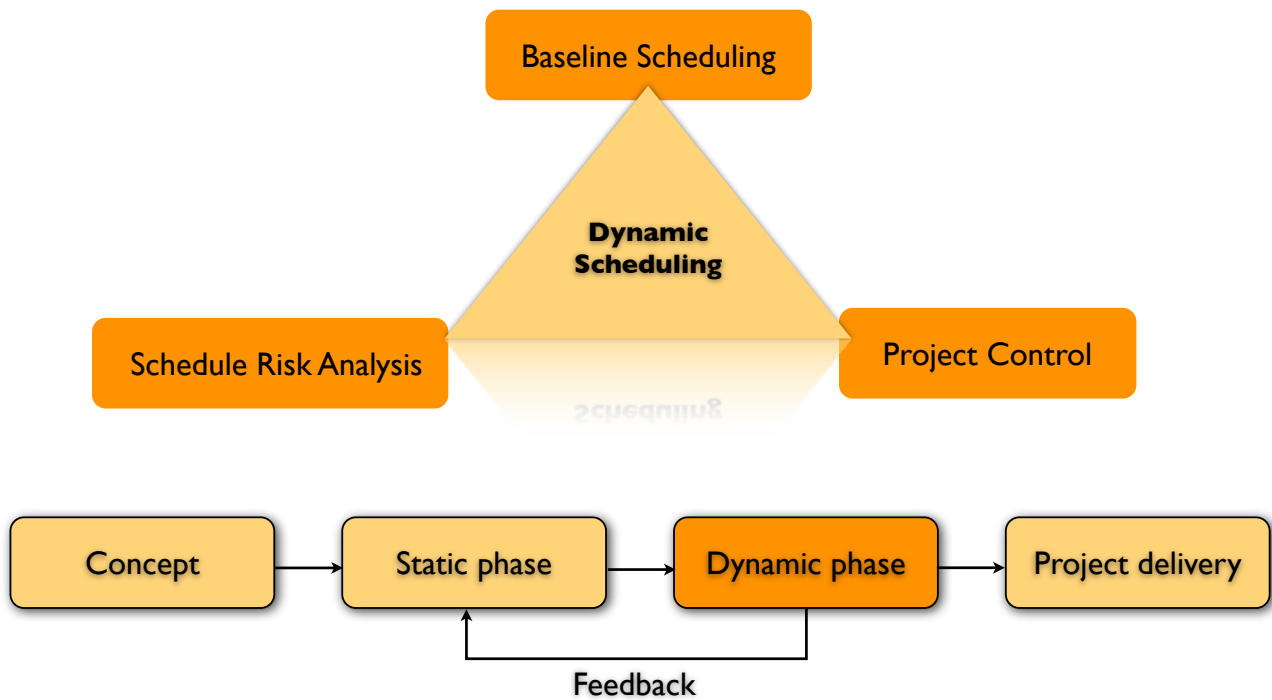
Project Life Cycle



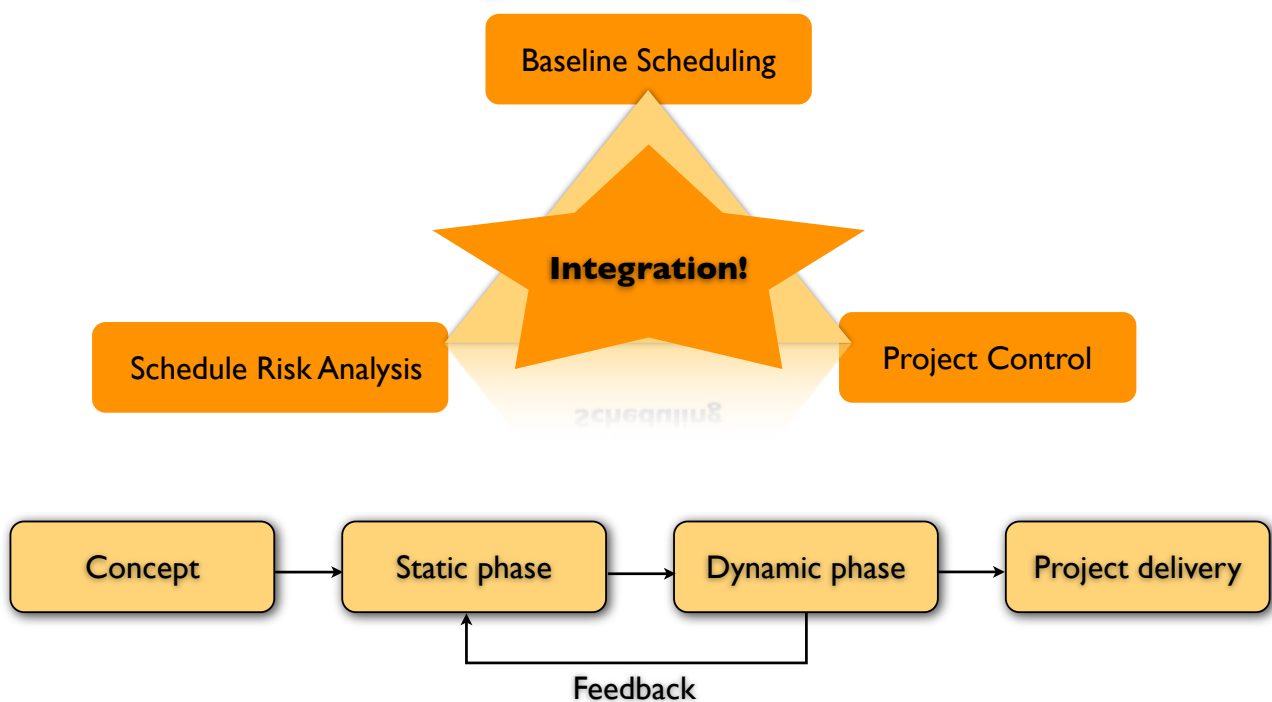
Project Life Cycle



Project Life Cycle



Project Life Cycle

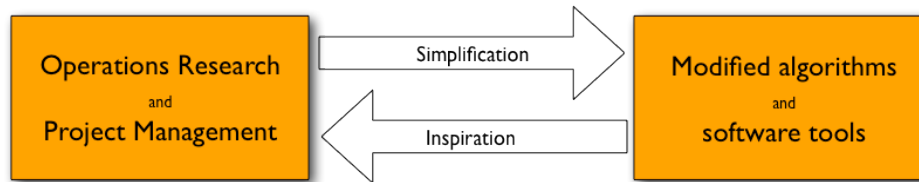


RESEARCH meets **PRACTICE**

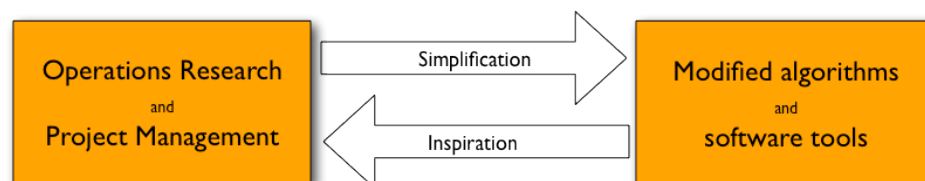
ICAOR

4th International Conference on **Applied** Operational Research - ICAOR 2012

25-27 July 2012

Grand Mercure Fortune
Bangkok, Thailand**Academic Research****Practical applications**

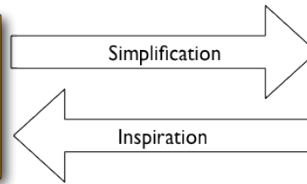
Outline

Academic Research**Practical applications**

Literature		
Use of data		
Publications		
Tools		
Sharing ideas		

Academic Research

Operations Research
and
Project Management



Practical applications

Modified algorithms
and
software tools

Literature	Academic journals	Popular press
Use of data		
Publications		
Tools		
Sharing ideas		

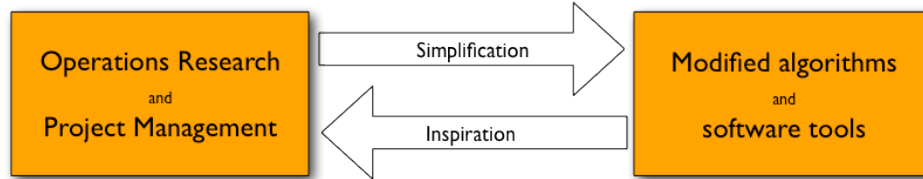
Dynamic Scheduling in Project Management

Topic	Methodology	Literature
Baseline scheduling	Resource-constrained project scheduling using priority rule-based scheduling with single-mode and multi-mode project activities	Demeulemeester and Herroelen (2002), Kolisch and Hartmann (2006), Brucker et al. (1990), Herroelen et al. (1999), Van Peteghem and Vanhoucke (2010), Vanhoucke (2012a), among others
Schedule risk analysis	Monte-Carlo simulation runs on the project baseline schedule	Vanhoucke (2010b, 2011), Hulett (1996), Williams (1992), among others
Project control	Earned Value Management (EVM) and its Earned Schedule (ES) based extensions	Vanhoucke (2010a), Lipke (2003), Fleming and Koppelman (2005), among others

Use of data

Academic Research

Practical applications

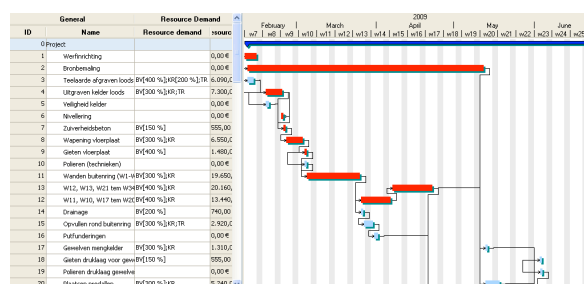


Literature	Academic journals	Popular press
Use of data	Simulated data and case studies	Consultancy projects
Publications		
Tools		
Sharing ideas		

Use of data

Real data

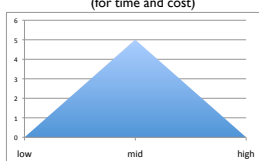
Simulated data



Project information

- Baseline Information
 - Start: 09/02/2009
 - End: 07/07/2009
 - BAC: € 737,212.38
- Real Progress:
 - # Reviews: 15
 - Real Finish: 30/08/2009
 - Real Cost: € 762,134.25

Activity Distributions (for time and cost)

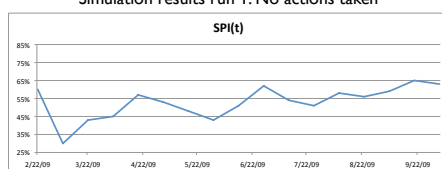


Actions List



Monte-Carlo Simulation

Simulation results run 1: No actions taken



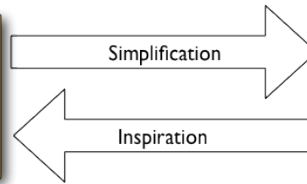
Simulation results run 2: Actions taken



Action contribution
04/10/2010 versus 30/08/2010

Academic Research

Operations Research
and
Project Management

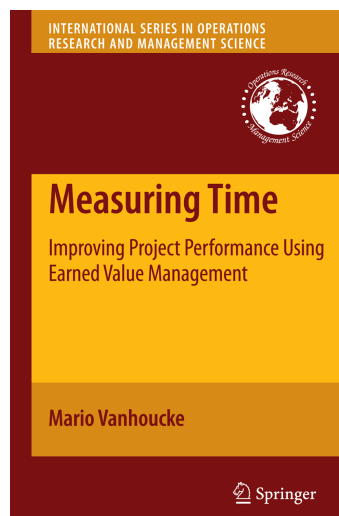
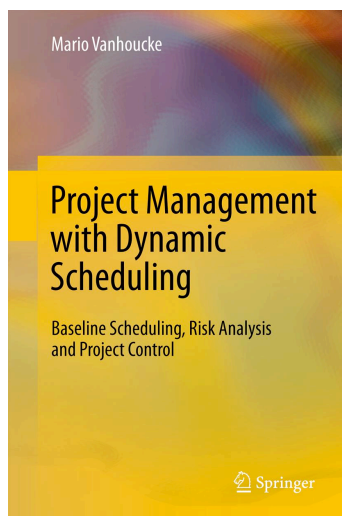


Practical applications

Modified algorithms
and
software tools

Literature	Academic journals	Popular press
Use of data	Simulated data and case studies	Consultancy projects
Publications	Academic journals and two books	The Measurable News
Tools		
Sharing ideas		

Mario Vanhoucke - Ghent University



The Measurable News

2012, Issue 1 3

The Measurable News

The Measurable News is an official publication of the College of Performance Management (CPM) at Ghent University.

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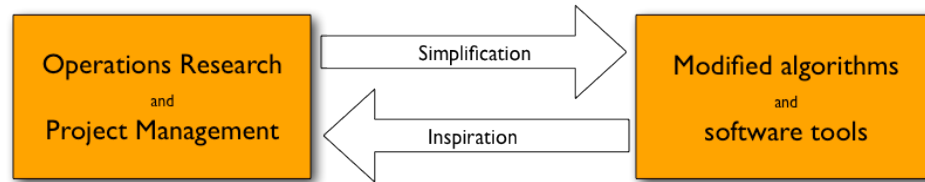
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Mario Vanhoucke - Ghent University

Academic Research

Practical applications

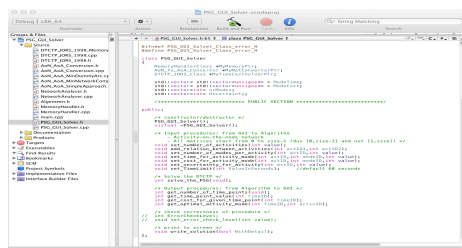


Literature	Academic journals	Popular press
Use of data	Simulated data and case studies	Consultancy projects
Publications	Academic journals and two books	The Measurable News
Tools	P2 Engine	ProTrack
Sharing ideas		

Mario Vanhoucke - Ghent University

P2 Engine

Advancing the state-of-the-art

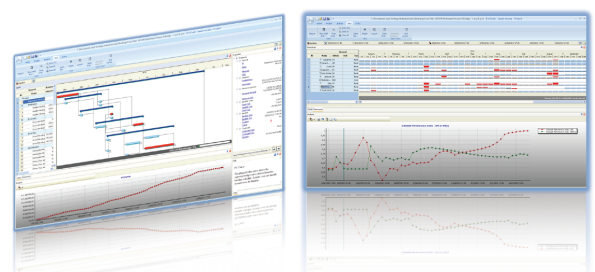


- Available to researchers
- Runs on Windows, Mac and Linux
- Based on LUA scripting language
- Runs on Super Computer (top 500)

www.p2engine.com

ProTrack 3.0

Dynamic scheduling on your desktop



- Online integration with PMKC
- Case studies available for teaching
- Used by students in PM courses
- Based on award winning research

www.protrack.be

Mario Vanhoucke - Ghent University



P2 Engine runs on the supercomputer

P2 Engine runs on the supercomputing infrastructure of Ghent University in order to generate terabytes of project data simulating project progress, risk metrics, performance measures, EVM data, and much more.

In a Belgian newspaper ([De Morgen](#), 20/06/2012), this supercomputing infrastructure is now ranked at place 118 in the world when it comes to computer speed.

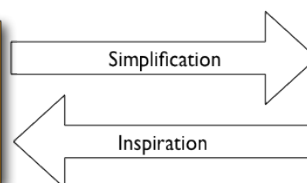
Sharing ideas

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Sharing ideas	Academic conferences and PMKC	Workshops for professionals and twitter

Sharing ideas

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PAST

FUTURE

Research study 1

= research study

Integration of dynamic scheduling

Awarded by

IPMA (Rome, Italy)

PMI (Brussels, Belgium)

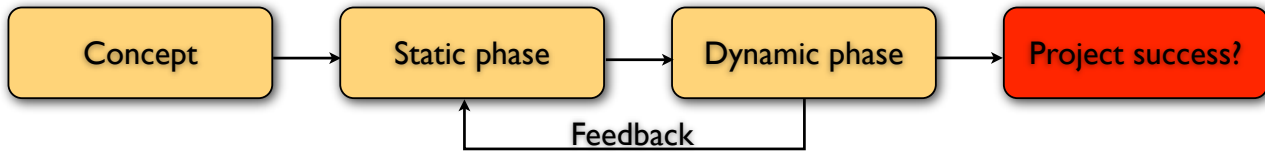
American Accounting Association (Denver, US)

Research study 2

= project success study

Integration of project life cycle

Future research



- Over a million euro project funded by the Flemish Government
- Synergy between Ghent University (Belgium), University College London (UK) and George Washington University (USA)
- Scope
 - Further integration (academic)
 - Further validation (practice)
 - Further commercialization (www.ProTrack.be en www.p2engine.com)



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