Conquering Complexity by optimizing execution

www.malotaux.eu/conferences

www.malotaux.eu/booklets booklet#9

Niels Malotaux

+31-655 753 604 niels@malotaux.eu www.malotaux.eu

Niels Malotaux

Delivering
Quality On Time
the Right Result
at the Right Time

- Independent Engineering and Team Coach
- Expert in helping projects and organizations to quickly become
  - More effective - doing the right things
  - More efficient - more effective in less time
  - More predictable - transparent
- Project Rescue (helping making 'impossible' deadlines possible)
- Embedded Systems architect (electronics/firmware)

- Project types
  electronics, firmware, software, space, road, rail, telecom, industrial control, parking system

niels@malotaux.eu

Earth Observation Instrument

- Very experienced Systems Engineers
- Using quantified requirements routinely
- 6 year pure waterfall project (imposed by ESA)
- Don't know exactly where they'll end up
- One problem: They missed all deadlines (can you help us)
- 9 weeks later: They haven't missed any deadline since
- Eventually: delivered 1 day early (instead of expected 1 year late)
- Savings: at least 40 person-year (about €6M)
- How did they do that ?

10 min … Convincing the Project Manager

- At a seminar at a happy customer
  - We're missing all deadlines
  - One bag of money
- One month later at the CTO:
  - Don't put me on the training budget
  - Better on the project budget
- Project Manager:
  - We're doing this kind of work for 27 years
  - We're very good at it
  - What do you think you can contribute to that ?
- Anything to achieve by the end of the week ?
  - A status report

Time needed?	Perhaps 2 hours
How much time available ?	I'm very busy !
… ?	Perhaps 4u
Wat still to do ?	Uhh… Input from 6 team-leads
How ?	Uhh…
Email ?	Uhh… Yes
Always response ?	No
Time per person ?	email, reminder, going there, status, in report
… ?	Uhh… ~1,5u per team
6 teams ?	6 x 1,5 = 9u
Will succeed, 9u in 4u ?	You go coach the team ! Wanted to get rid of me …

Is there a problem with proper execution ?

- Always right ?

- Always on time ?

How to save time

- Half of what we do in our work later proves not to have been needed
- If we see that before spending time on it, we can still decide not to do it
- This frees time to do the needed things even better, and still deliver on time

- ~~Retrospectives~~ → Prespectives

Ultimate Goal of a What We Do
(for our salary)

Quality on Time

- Delivering the Right Result at the Right Time, wasting as little time as possible (= efficiently)

- Providing the customer with
  - what they need
  - at the time they need it
  - to be satisfied
  - to be more successful than they were without it
- Constrained by (win - win)
  - what the customer can afford
  - what we mutually beneficially and satisfactorily can deliver
  - in a reasonable period of time

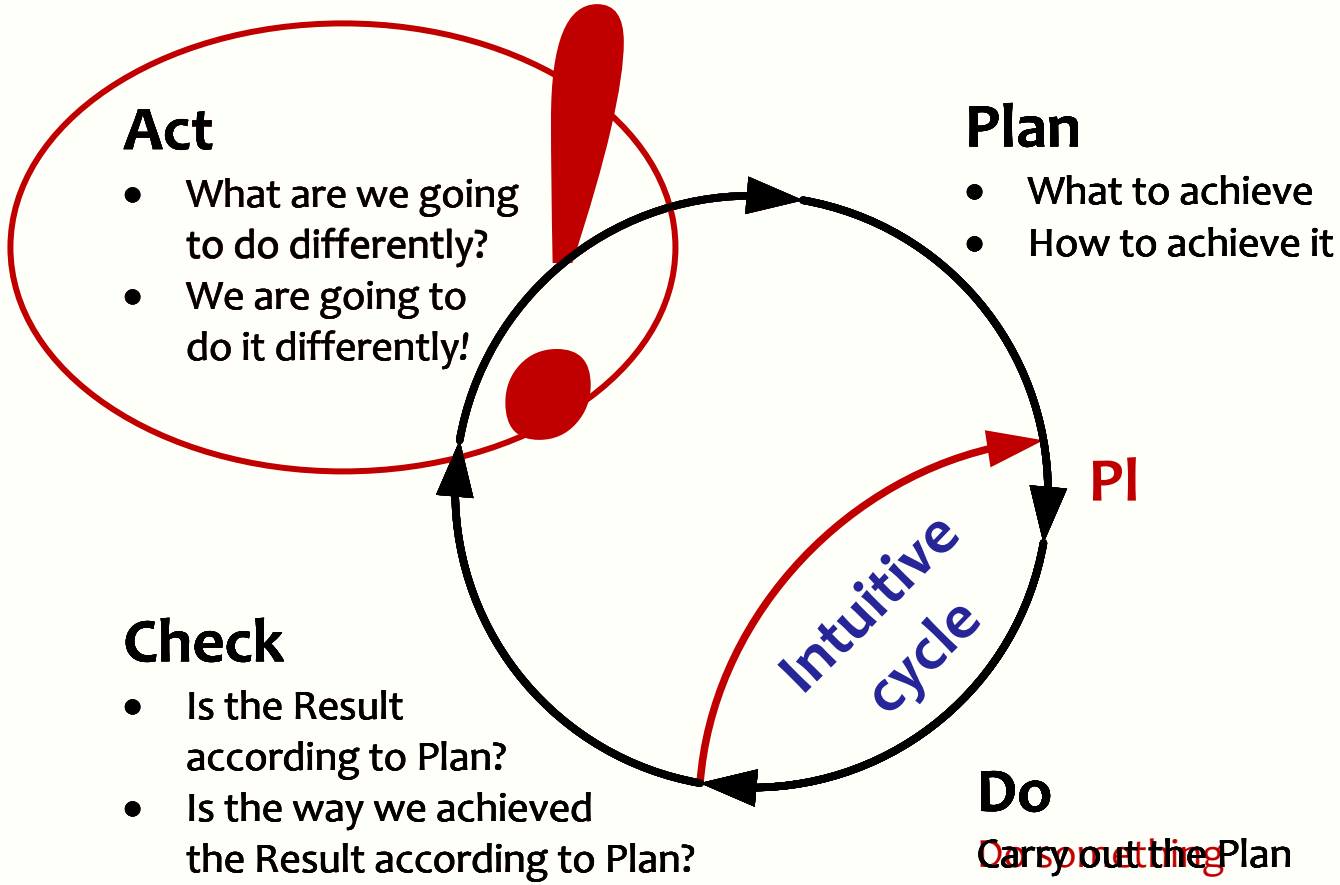
Is there a problem with proper execution ?

- Always right ?
- Always on time ?
- Anything to better do differently in your work ?

- Providing the customer with
  - what they need
  - at the time they need it
  - to be satisfied
  - to be more successful than they were without it
- Constrained by (win - win)
  - what the customer can afford
  - what we mutually beneficially and satisfactorily can deliver
  - in a reasonable period of time

The essential ingredient: the PDCA Cycle

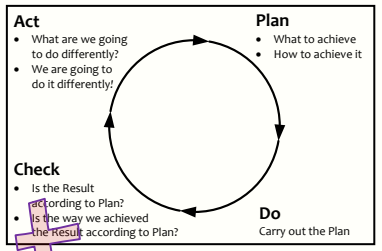
(Shewhart Cycle - Deming Cycle - Plan-Do-Study-Act Cycle - Kaizen)



Evolutionary Project Management elements (Evo)

Tom Gilb

- Plan-Do-Check-Act
  - The powerful ingredient for success
- Business Case
  - *Why* we are going to improve *what*
- Requirements Engineering
  - *What* we are going to improve and *what not*
  - How much we will improve: *quantification*
- Architecture and Design
  - Selecting the *optimum compromise* for *the conflicting requirements*
- Early Review & Inspection
  - Measuring quality while doing, learning to prevent doing the wrong things



Why

What
How much
Are we done

How

Check and learn as early as possible

Zero Defects Attitude

Evolutionary Planning - Niels

- Weekly TaskCycle
  - Short term planning
  - Optimizing estimation
  - Promising what we can achieve
  - Living up to our promises
- Bi-weekly DeliveryCycle
  - Optimizing the requirements and checking the assumptions
  - Soliciting feedback by delivering Real Results to *eagerly waiting Stakeholders*
- TimeLine
  - Getting and keeping control of Time: Predicting the future
  - Feeding program/portfolio/resource management

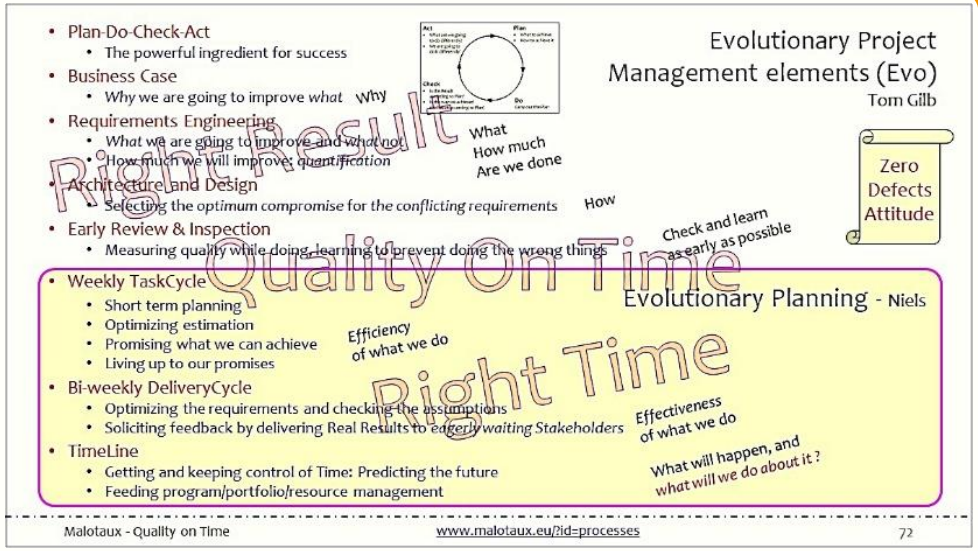
Efficiency of what we do

Effectiveness of what we do

What will happen, and what will we do about it ?

Write down:

www.malotaux.eu/Workshop



1. What are you supposed to achieve in your work ?
2. Any deadlines ?
3. What are you supposed to achieve the coming week ?
4. How much time do you have the coming week ?
5. What do you plan to do for work the coming week ? (make a list here)
6. Will all of that be done by the end of the week ?
7. How do you know ?
8. Is all of that really needed ?
9. Will you have achieved all by the end of the week ?
10. Any issues with the above or otherwise with your work or project ?

1 - What are you supposed to achieve in your work?

2 - Any deadlines ?

3 - What are you supposed to achieve the coming week ?

4 - How much time do you have the coming week ?

5 - What do you plan to do for work the coming week? (make a list here)

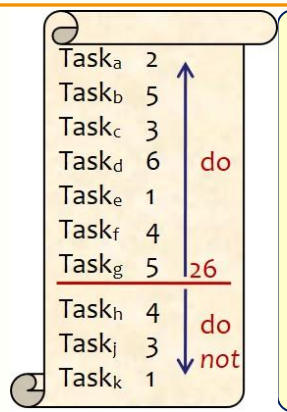
		description
1		
2		
3		
4		
5		
6		
7		
8		
9		

6 - Will all of that be done by the end of the week ?

7 - How do you know ?

8 - Is all of that really needed ?

'Innocent' questions for preflection



People come in with their week plan,
come out with a modified plan,
more going to work on the right things,
less spending time on unnecessary things.
Immediate savings.
From day one.

- Really ?
- Should we ?
- Why would we do that ?
  (never use 'you')
- Who's waiting for that ?
- What do they need ?
- How much do they need ?
- When do they need it ?
- Is it really necessary ?
- Is it really necessary now ?
- How do we know ?

- Why ?
- What happened ?
- What could we do ?
- Will we be on time ?
- What makes us think that ?
- What's different this time ?
- Is this the best way to do it ?
- Does it fit the available time ?
- *If there is any problem:*
  What-are-we-going-to-do-about-it ?

Never challenge an estimate !
If we don't understand the estimate,
only say:
- What are you planning to do ?
- Now estimate again …

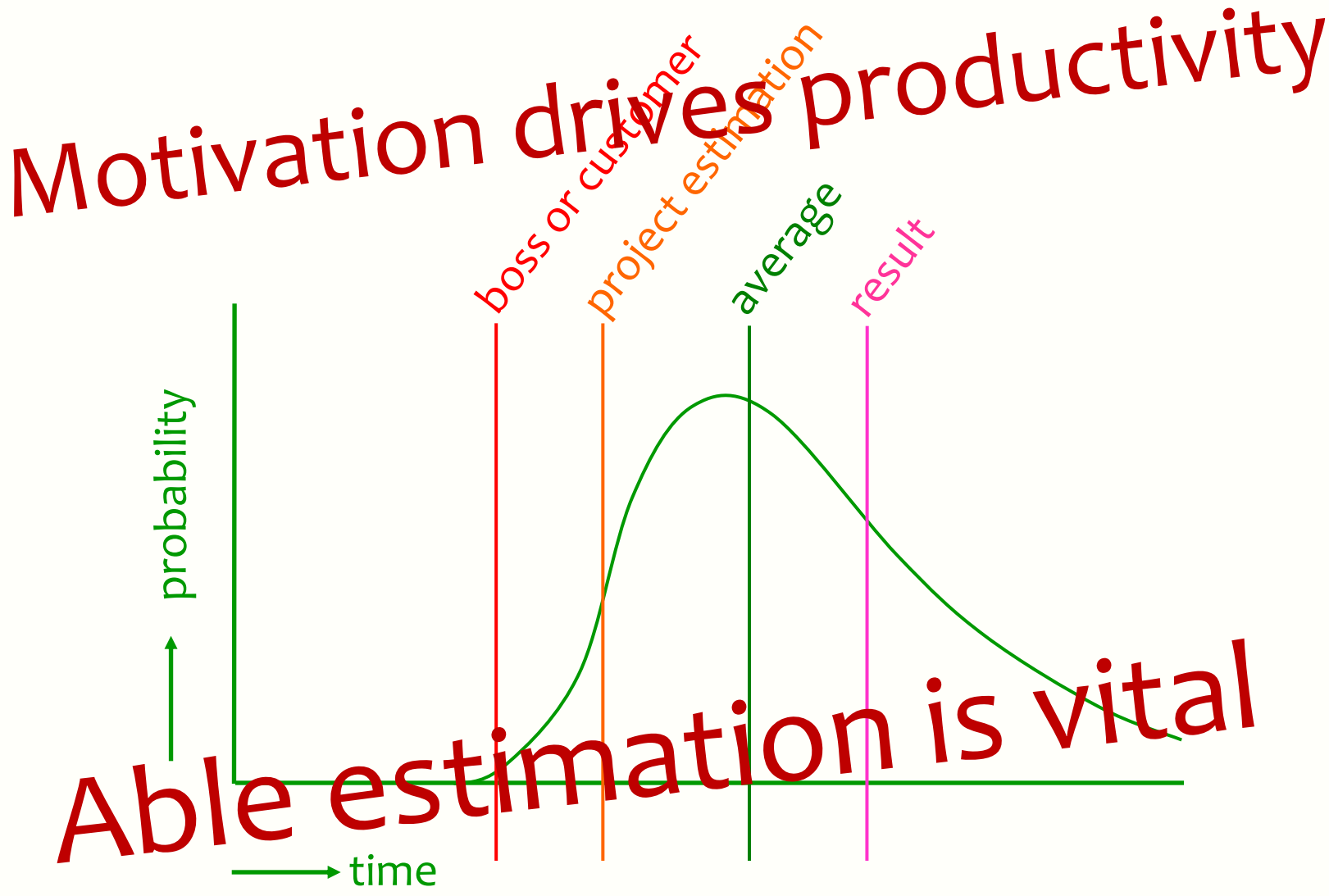
If they insist:
- Let them find out themselves

9 - Will you have achieved all by the end of the week ?

10 - Any other issues ?

Estimation Exercise

Lead time


Motivation drives productivity
boss or customer
project estimation
average
result
probability
time
Able estimation is vital

Estimation Exercise

Are you an optimistic or a realistic estimator?

Let's find out !

Project:

Multiplying two numbers of 4 figures

no computer, no calculator, just paper and pencil !

Example

```
    0000
    0000  x
----------
00000000
```

How much time do you need to complete this Project?

write it down !

Is this what you did?

```
    4567
    9876   x
-----------
   27402
  319690
 3653600
41103000   +
-----------
45103692
```

Defect rate

- Before verification ?
- After verification ?
- After validation ?

Alternative Design (*how* to solve the requirement)

9876

4567 x

Another alternative design

There are usually more, and possibly better solutions than the obvious one

9876 = 10000 - 124

1 x 4567 x 100 =	456700	
2 x 4567 x 10 =	91340	
2 x 2 x 4567 = 9134 x 2 =	18268	+
124 x 4567 =	566308	
10000 x 4567 =	45670000	
124 x 4567 =	566308	-
	45103692	

What was the real requirement?

$$\begin{array}{r} 7654 \\ 6789 \quad x \\ \hline 51963006 \end{array}$$

Failing the validation !

Assumptions, assumptions ...

Better assume that our assumptions can be wrong.

Check !

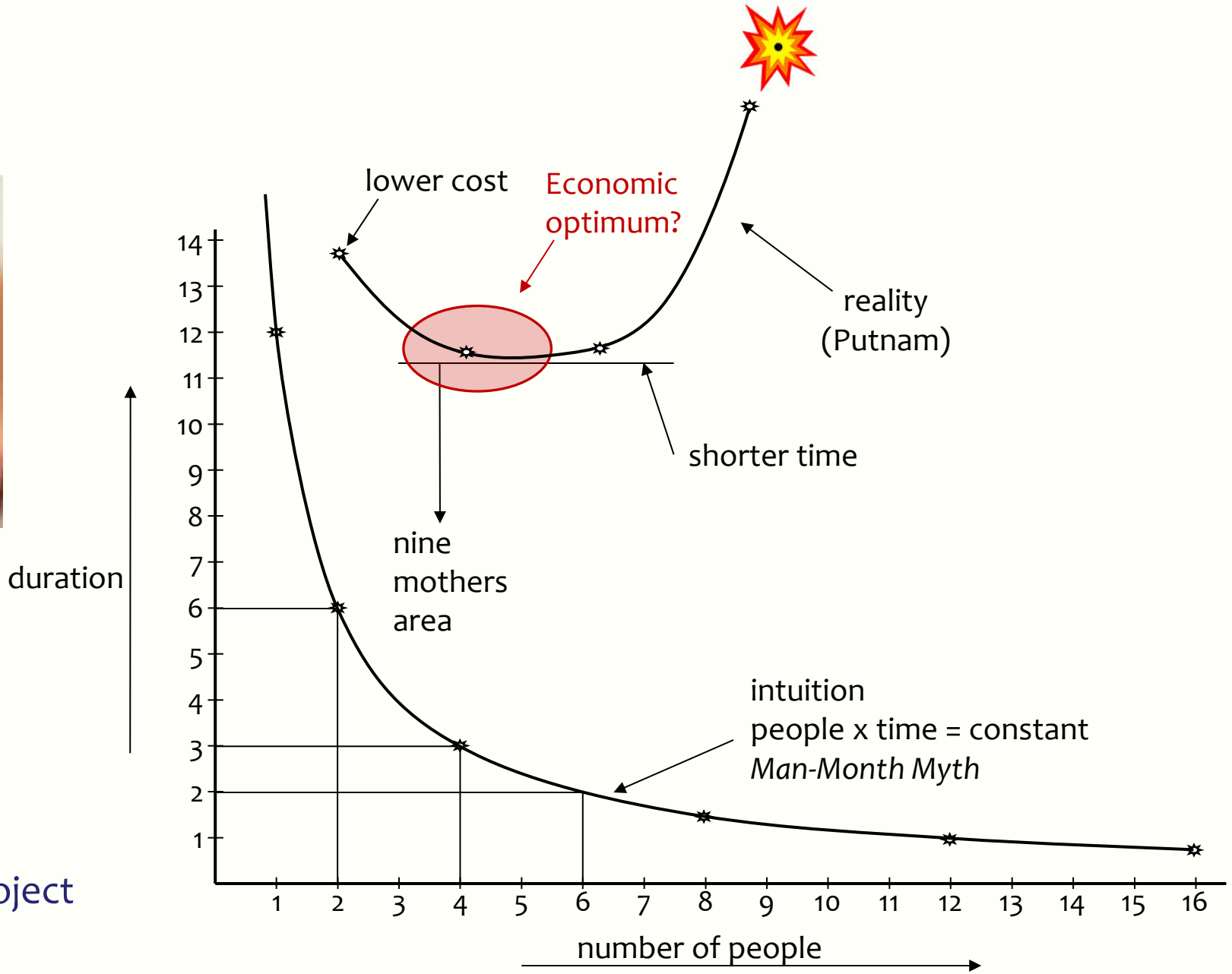
Elements in the exercise

- Estimation, optimistic / realistic
- Interrupts
- Verification, verification strategy
- Validation
- Defect-rate
- Design, design options
- Requirements
- Assumptions

Deceptive options

1. Hoping for the best (fatalistic)
2. Going for it (macho)
3. Working Overtime (fooling ourselves and our boss)
4. Moving the deadline
   - Parkinson's Law
     - Work expands to fill the time for its completion
   - Student Syndrome
     - Starting as late as possible, only when the pressure of the FatalDate is really felt

5. Adding people



Brooks' Law (1975)

Adding people to a late project *makes it later*

6. Saving time

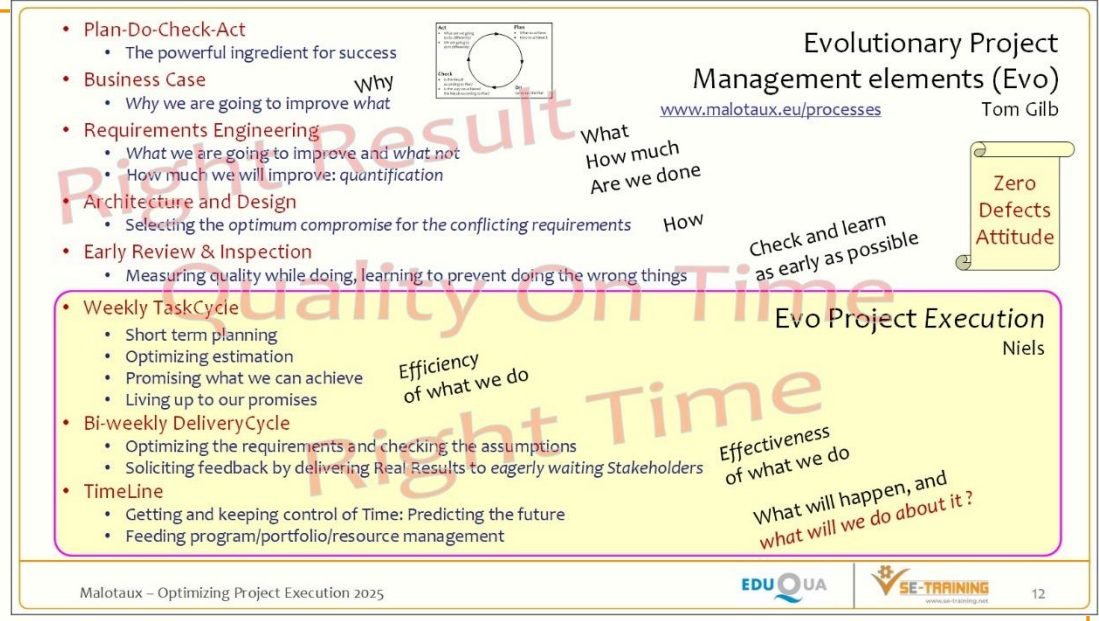
Continuous
elimination of waste
(www.malotaux.eu/essenceoflean)

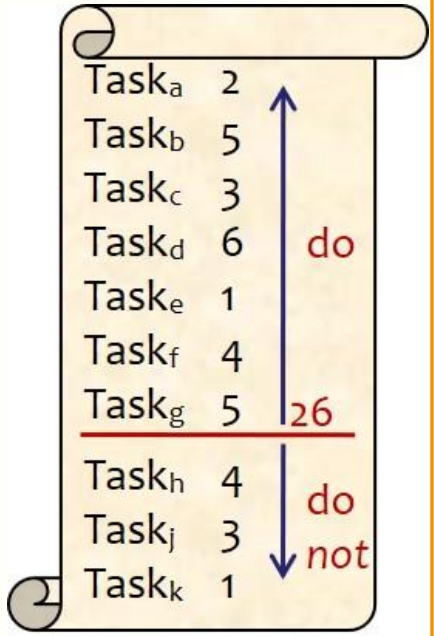
We don't have enough time,
but we can save time *without negatively affecting the Result !*

- Efficiency in *what* (*why*, for *whom*) we do - doing the right things (www.malotaux.eu/evo)
  - *Not* doing what later proves to be superfluous
- Efficiency in *how* we do it - doing things differently
  - The product (www.malotaux.eu/designlog)
    - Using proper and most efficient solution, instead of the solution we always used
  - The project (www.malotaux.eu/projectmanagement)
    - Spending less time, instead of immediately doing it the way we always did
  - Continuous improvement and prevention processes (www.malotaux.eu/PDCA)
    - Constantly learning doing things better and overcoming bad tendencies
- Efficiency in *when* we do it - right time, right order (www.malotaux.eu/timeline)
- TimeBoxing - much more efficient than FeatureBoxing (www.malotaux.eu/timeboxing)

Weekly TaskCycle

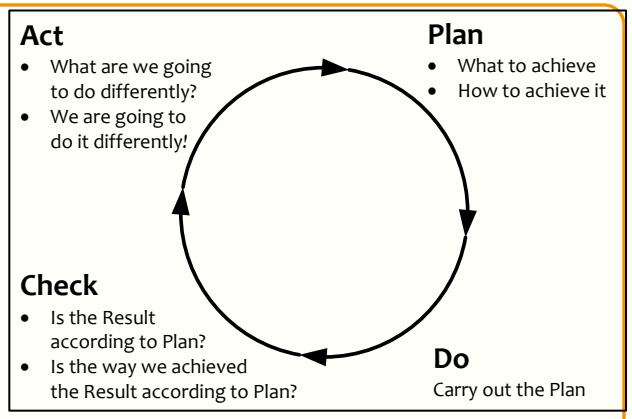
- What are we supposed to achieve
- How much time do we have available
- 2/3 of gross available time is net plannable time
- What is most important to do
  in order to achieve what we're supposed to achieve
- Estimate net effort needed to do these things
- Which most important things fit the net plannable time
  (default 2/3 of gross available time, 26 hr per week at 40hr work-week)
- What can, and what are we going to do
- What are we *not* going to do
- *Write it down ! Our fuzzy mind isn't good enough !*





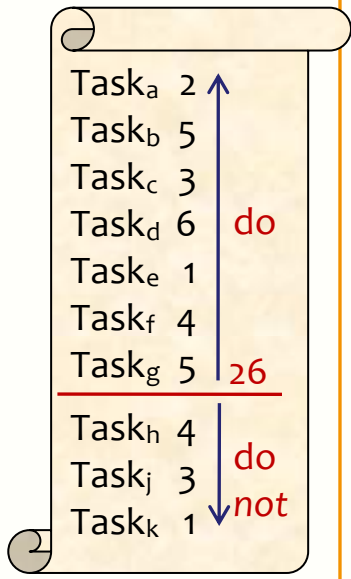
2/3 is default start value
this value works well with development work

Every week: reflecting and preflecting

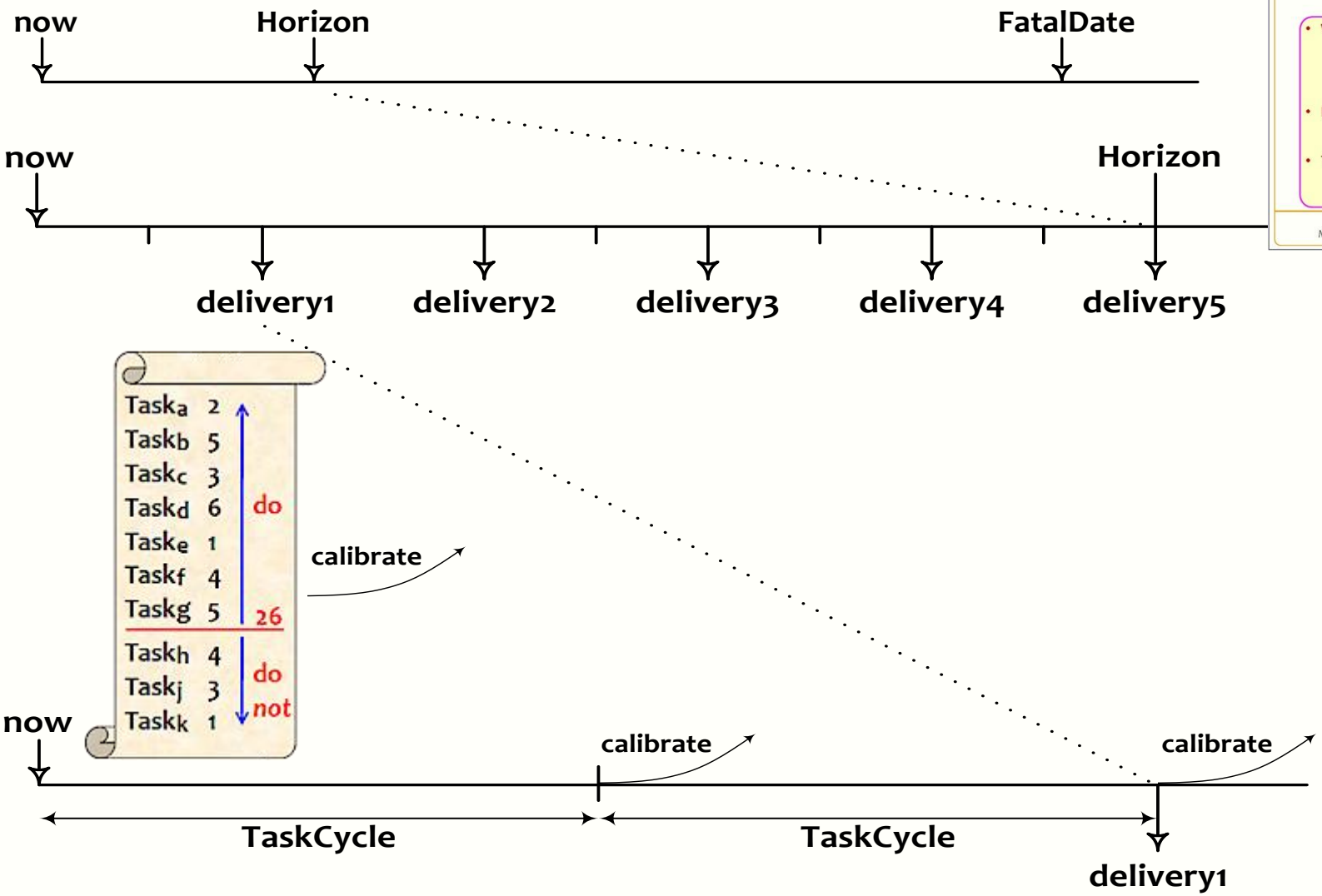


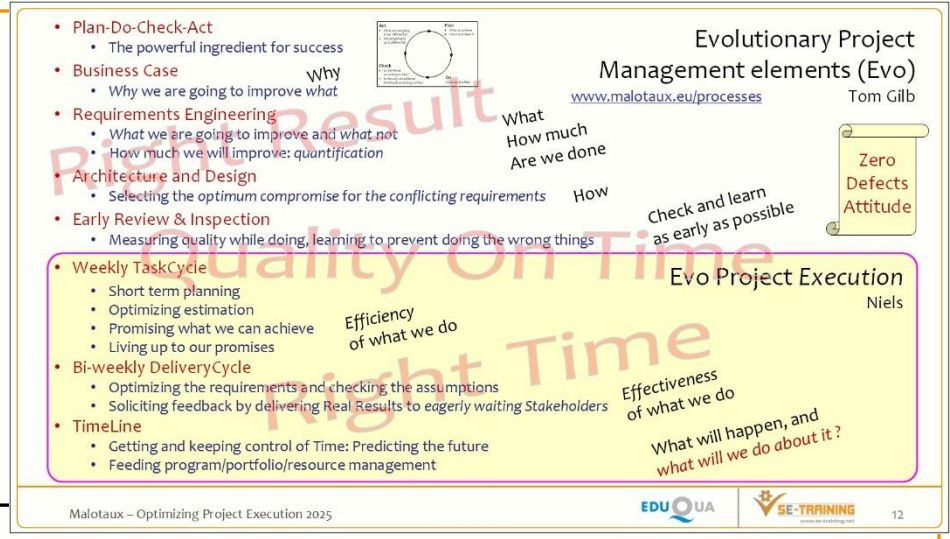
- Was all planned work really done ?
- If a Task was not completed, we learn:
  - Time spent but needed more time ? → effort estimation problem
    - What did I think then, what do I know now → learn (Check and Act)
  - Time not spent? → time management problem
    - Too much distraction
    - Too much time spent on other (poorly-estimated) Tasks
    - Too much time spent on other things
- Close unfinished Tasks after having dealt with the consequences
  - Feed the disappointment of the "failure" into your intuition mechanism
  - Define remaining Tasks, and put on the Candidate Task List
  - Declare the Task finished after having taken the consequences
- Continue with planning the Tasks for the next week

Immediate consumption of metrics



TimeLine: Result to Tasks, and back





cycle	who	task description	estim	real	done	issues
3	John	*Net time available: 26*				
		aaaaaaaaa	3	3	yes	
		bbbbbbbb [Paul]	1			
		ccccccccc	5	13	yes	
		ddddddddd	2			
		eeeeeeee	3	2		
		fffffffffff	2	1		
		ggggggggg	6	7	yes	
		hhhhhhhh	4			
			26	26		
4	John	*Net time available: 26*				
		jjjjjjjjjjjjj	3			for proj x
		~~kkkkkkkkk~~				for proj x
		mmmmm	5			for proj x
		~~nnnnnnn~~				for proj x
		~~pppppppp~~				for proj y
		qqqqqqqq	12			for proj y
		rrrrrrrrrrrr	6			for proj y
		~~sssssssss~~				for proj y
		~~ttttttttttt~~				for proj y
			26			

TaskCycle Analysis (retrospective)

learning

TaskCycle Planning (presepective)

From 60hr to 26hr, delivering better results

- One of three in a team insisting to work 60 hr the next week
- That probably won't all be done by the end of the week, right ?
- "Yes, but it >has< to be done !"
- Isn't that bad for your health? The others nodded
- After a long discussion, he gave in: planned 26 effort hours for that week
- Few weeks later he took me apart:

  Niels, thank you !
  I was nuts, getting tired spending so many hours
  Now, every week I plan 26 net hours,
  getting done *more than ever before*

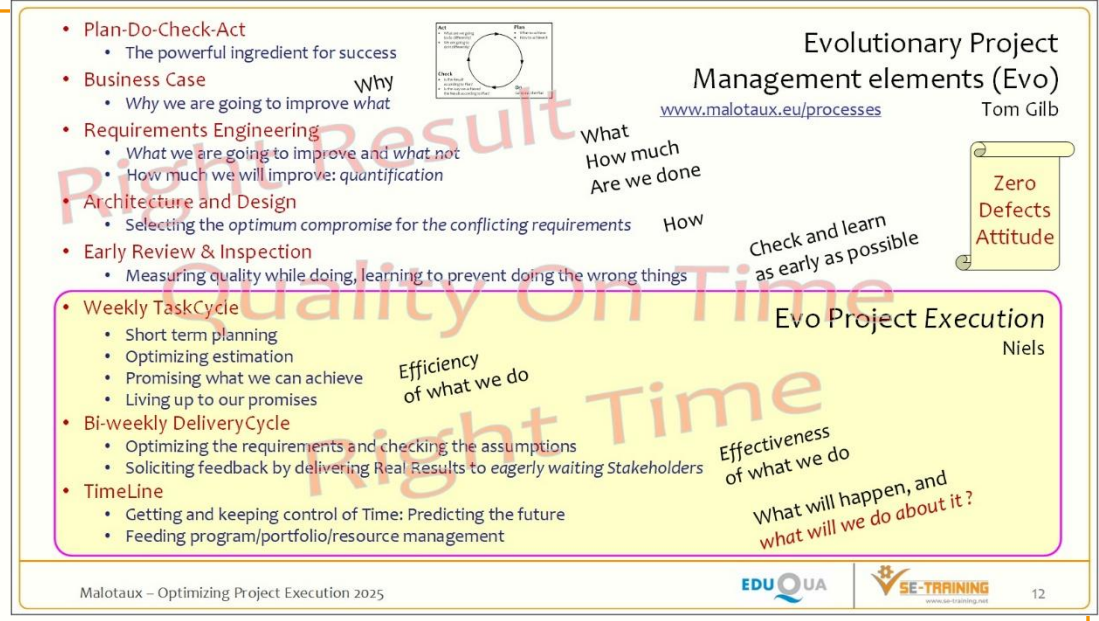
No excuse anymore !

- Delivering the Right Results at the Right Time isn't really difficult
- I showed you some examples of how to do it
- No complaining or excuses: *What are we going to do about it ?!*

- Want to learn more detail ?
  - 2-day course, 9 - 10 March, Zürich

Optimizing Project Execution

- Importance of time
- Human behavior affecting our performance
- Good enough estimation isn't difficult
- Project life-cycles
- Evolutionary planning
- Stakeholders & requirements
- Selecting priorities
- Architecture and design
- Examples
- Exercises on your own situation



Active Synchronization

Somewhere around us, there is the bad world.

If we are waiting for a result outside our control, there are three possible cases:

1. You are sure they'll deliver Quality On Time
2. You are not sure
3. You are sure they'll not deliver Quality On Time

- If you are not sure (case 2), better assume case 3
- From other Evo projects you should expect case 1
- Evo suppliers behave like case 1

In cases 2 and 3: Actively Synchronize: Go there !

1. Showing up increases your priority
2. You can resolve issues which otherwise would delay delivery
3. If they are really late, you'll know much earlier

Conquering Complexity by optimizing execution

www.malotaux.eu/conferences

www.malotaux.eu/booklets booklet#9

Niels Malotaux

+31-655 753 604 niels@malotaux.eu www.malotaux.eu