EMEA Systems Engineering Conference 2014
28 October 2014, Cape Town

Niels Malotaux

If space systems engineers could learn how to meet any deadline, couldn't you too?

N R Malotaux - Consultancy
tel +49-5632 922 5132
mob +31-655 753 604
fax +49-5632 923 9054
niels@malotaux.nl
www.malotaux.nl

Niels Malotaux

Niels Malotaux is an independent Project Coach and expert in optimizing project performance. He has over 40 year experience in designing electronic and software systems, at Delft University, in the Dutch Army, at Philips Electronics and 20 years leading his own systems design company. Since 1998 he devotes his expertise to helping projects to deliver Quality On Time: delivering what the customer needs, when he needs it, to enable customer success. To this effect, Niels developed an approach for effectively teaching Evolutionary Project Management (Evo) Methods, Requirements Engineering, and Review and Inspection techniques. Since 2001, he taught and coached well over 150 projects in 30+ organizations in the Netherlands, Belgium, China, Germany, India, Ireland, Israel, Japan, Romania, South Africa, the UK and the US, which led to a wealth of experience in which approaches work better and which work less in real practice.

Niels puts development teams on the Quality On Time track and coaches them to stay there and deliver their quality systems on time, without overtime, without the need for excuses. Practical methods are developed, used, taught and continually optimized for:

- Evolutionary Project Management (Evo)
- Requirements Engineering and Management
- Reviews and Inspections
- Zero Defects delivery

Within a few weeks of turning a development project into an Evo project, the team has control and can tell the customer when the required features will all be done, or which features will be done at a certain date. Niels enjoys greatly the moments of enlightenment experienced by his clients when they find out that they can do it, that they are really in control, for the first time in their lives.

N R Malotaux
Consultancy

Niels Malotaux
project coach

Zum Anspel 5
59964 Düdinghausen
Deutschland
tel +49-5632-922 5132
mob +31-655 753 604
niels@malotaux.nl
www.malotaux.nl

Result Management

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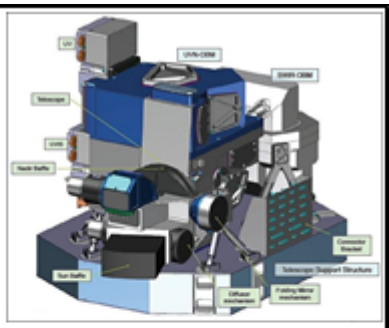
Today

- Is there a problem
- Universal goal of any project
- Human behaviour in projects
- Estimation
- Evolutionary Project Planning - prevention is better than cure
  - Optimizing the efficiency of what we do
  - Optimizing the effectiveness of what we do
- How to make sure that we get the right result at the right time
- Business case - stakeholders - requirements
- How to specify results - How to select the right solution
- How to check that we wrote the right things – Reviews and Inspections
- How to work towards Zero Defects
- Planning your own work using these principles

Malotaux 3

Earth Observation Satellite



- Their only problem: They missed all deadlines
- Now: They haven't missed any deadline for at least a year

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Is delivery time important ?

- Will we be on time ?
- If yes: How do we know ?
- If no: Why ?
- Failure is not an option:
  - What can we do about it ?
- What is 'on time' ?

Malotaux 5

Why is time important

Return on Investment (ROI)

- \+ **Benefit of doing** - huge (otherwise other projects would be more rewarding)
- – **Cost of doing** - project cost, usually minor compared with other costs
- – **Cost of doing nothing** - every day we start later, we finish later
- – **Cost of being late** - lost benefit

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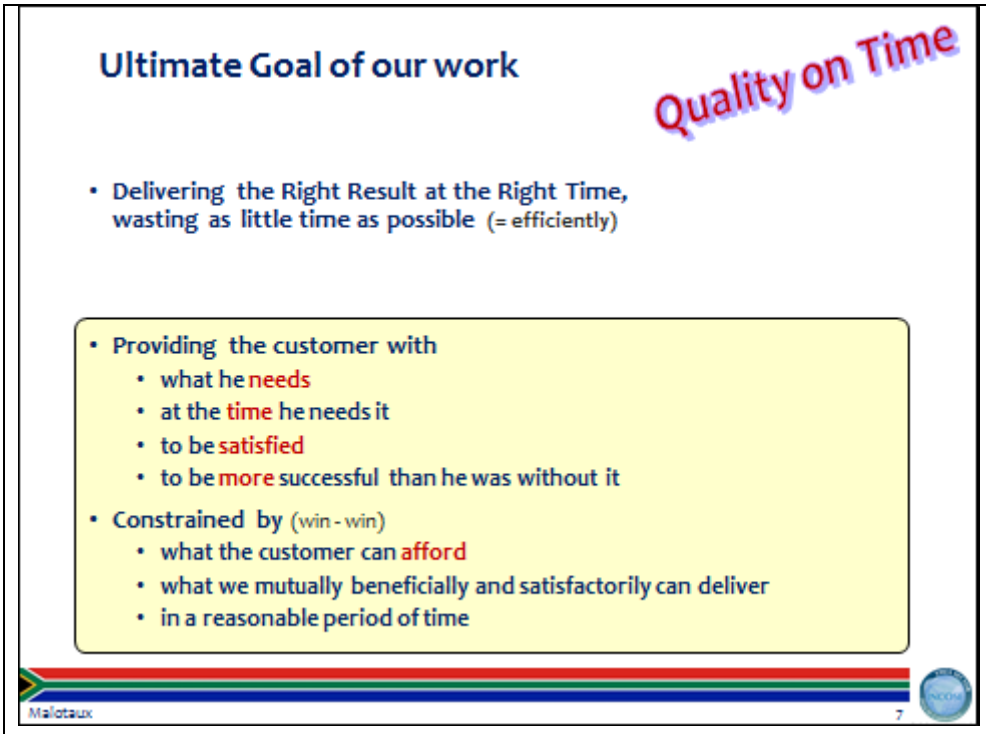

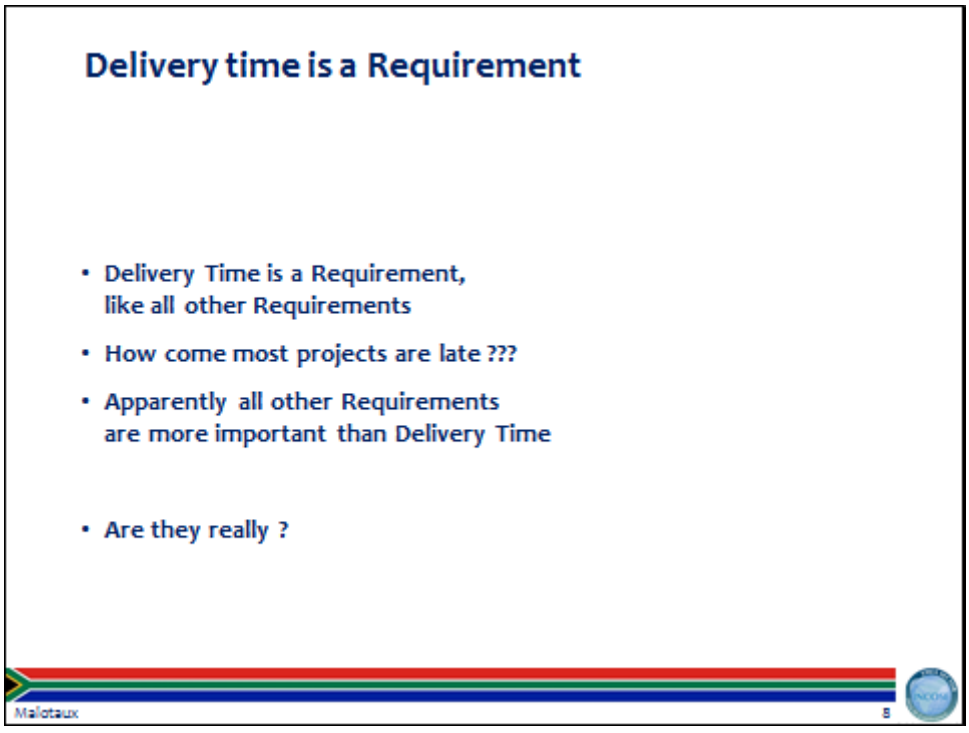

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What is the cost of one day of (unnecessary) delay ?

- What is the cost of the project per day ?
- Do you know how much you cost per day ?
  Note: that's not what you get !
- If you don't know the benefit, assume 10 times the cost
- How can you make decisions, if you don't know ?

- No need for exact numbers - it'll be a lot anyway
- Do you know the benefit of your projects ?
- Do you know the penalty for delay ?
- Who is paying for the extra time ?

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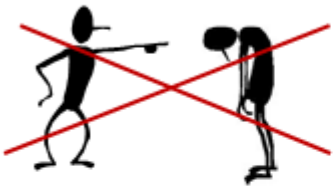
Isn't that the Responsibility of the Project Manager ?



- The Project Manager is *responsible* for *delivering* the right result at the right time
- The Project Workers work and decisions *determine* the result and the time it is delivered
- This makes *everybody* in the project as responsible as Project Management

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I want V-O-L-U-M-E !

- Produce faster ! → bad quality → produce slower
- Produce quality ! → produce faster

Quick delivery of a solution that doesn't work means *no delivery*

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Causes of Delay

- Some typical causes of delay are:
  - Developing the wrong things
  - Unclear requirements
  - Misunderstandings
  - No feedback from stakeholders
  - No adequate planning
  - No adequate communication
  - Doing unnecessary things
  - Doing things less cleverly
  - Waiting (before and during the project)
  - Changing requirements
  - Doing things over
  - Indecisiveness
  - Suppliers
  - Quality of suppliers results
  - No Sense of Urgency
  - Hobbying
  - Political ploys
  - Boss is always right (culture)
- What are causes of these causes ? (use 5 times 'Why ?')

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Causes of causes

- Management
- No Sense of Urgency
- Uncertainty
- Perceived weakness
- Fear of Failure
- Ignorance
- Incompetence
- Politics
- Indifference
- Perception
- Lack of time
- Not a Zero Defects attitude
- No techniques offered
- No empowerment
- Discipline
- Intuition

Intuition often guides us in the wrong direction

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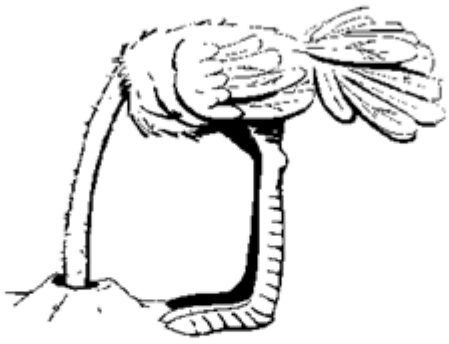

The problems in projects are not the real problem,
the real problem is that we don't do something about it

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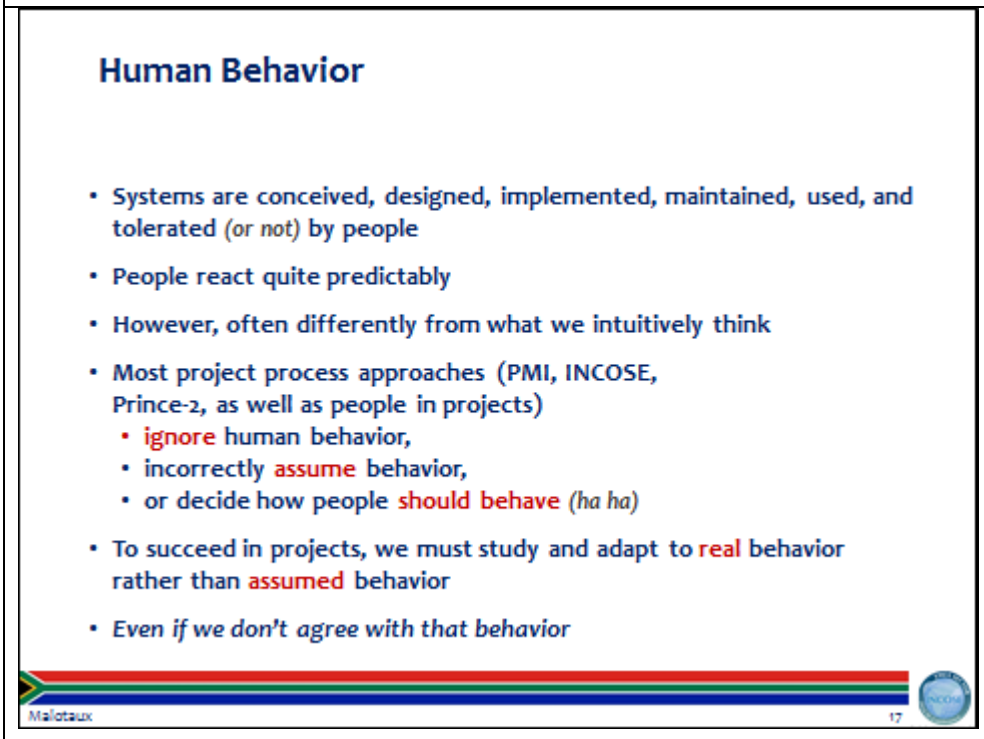

Discipline

- Control of wrong inclinations
- Even if we know how it should be done ...
  (if nobody is watching ...)
- Discipline is difficult
- Romans 7:19
  - The good that I want to do, I do not ...

→ Helping each other (watching over the shoulder)
→ Rapid success (do it 3 weeks for me...)
→ Making mistakes (provides short window of opportunity)
→ Openness (management must learn how to cope)

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Intuition

- Makes us react on every situation
- Intuition is fed by experience
- It is free, we always carry it with us
- We cannot even turn it off
- Sometimes intuition shows us the wrong direction
- In many cases the head knows, the heart not (yet)
- Coaching is about redirecting intuition

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Communication

- Traffic accident: witnesses tell their truth
- Same words, different concepts
- Human brains contain rather fuzzy concepts
- Try to explain to a colleague
- Writing it down is explaining it to paper
- If it's written it can be discussed and changed
- Vocal communication evaporates immediately
- E-mail communication evaporates in a few days

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Communication

- Talking as near as possible past each other

To each other

Past each other

- Don't *assume* we understand: *check* !

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Perception

- Quick, acute, and intuitive cognition (www.M-W.com)
- What people say and what they do is not always the same
- The head knows, but the heart decides
- Hidden emotions are often the drivers of behavior
- Customers who said they wanted lots of different ice cream flavors from which to choose,
  still tended to buy those that were fundamentally vanilla
- So, trying to find out what the real value to the customer is, can show many paradoxes
- Better not simply believe what they say: *check!*

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Excuses, excuses, excuses …

- We have been thoroughly trained to make excuses
- We always downplay our failures
- It's always 'them' – How about 'us' ?
- At a Fatal Day, any excuse is in vain: we failed
- Even if "we really couldn't do anything about it"
- Failure is a very hard word. That's why we are using it !
- No pain, no gain
- We never say: "*You* failed", try: "*We* failed"
  - After all, *we* didn't help the person not to fail

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Short-Circuiting

Saves a lot of time

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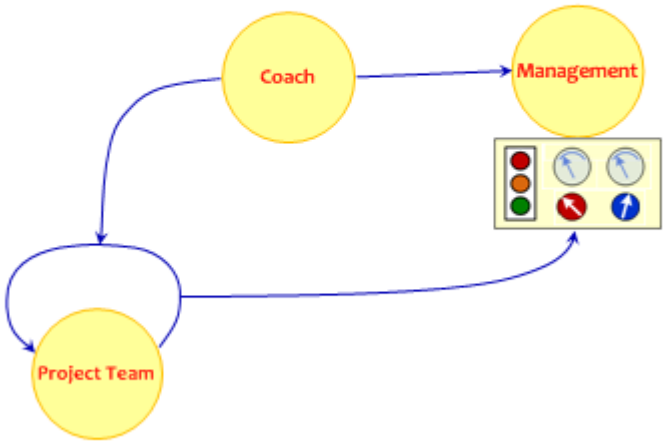
Local Loop Principle



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Estimation
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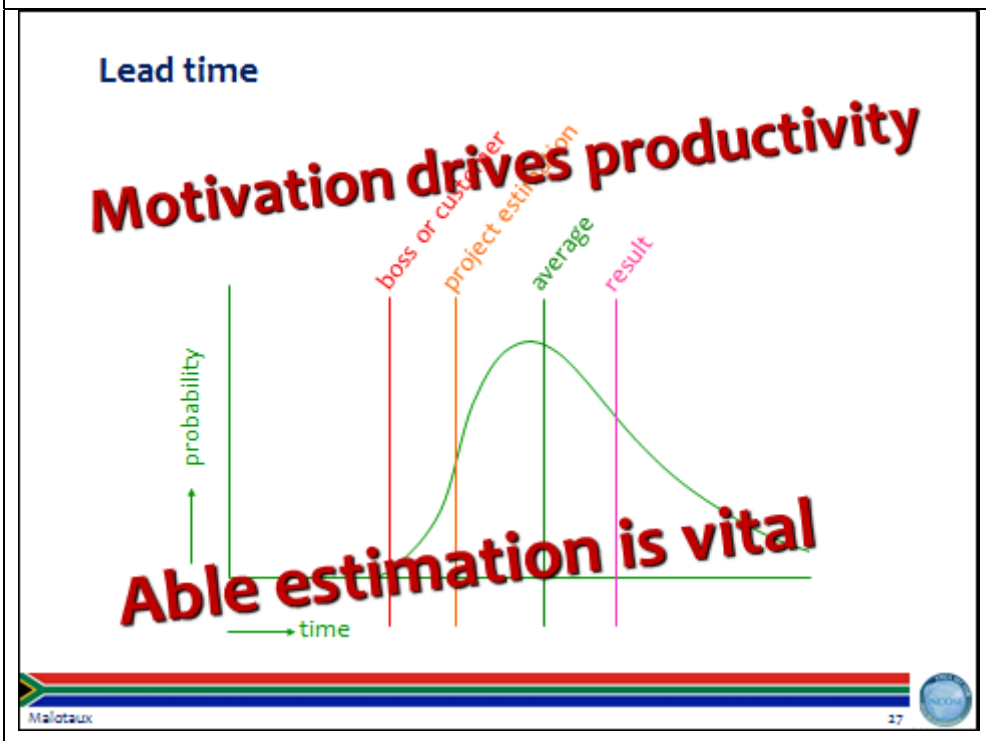
Lead time
Motivation drives productivity
boss or customer
project estimation
average
result
probability
time
Able estimation is vital
Malotaux
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Estimation Exercise

Are you an optimistic or a realistic estimator?

Let's find out !

Project:

Multiplying two numbers of 4 figures

How many seconds would you need to complete this Project?

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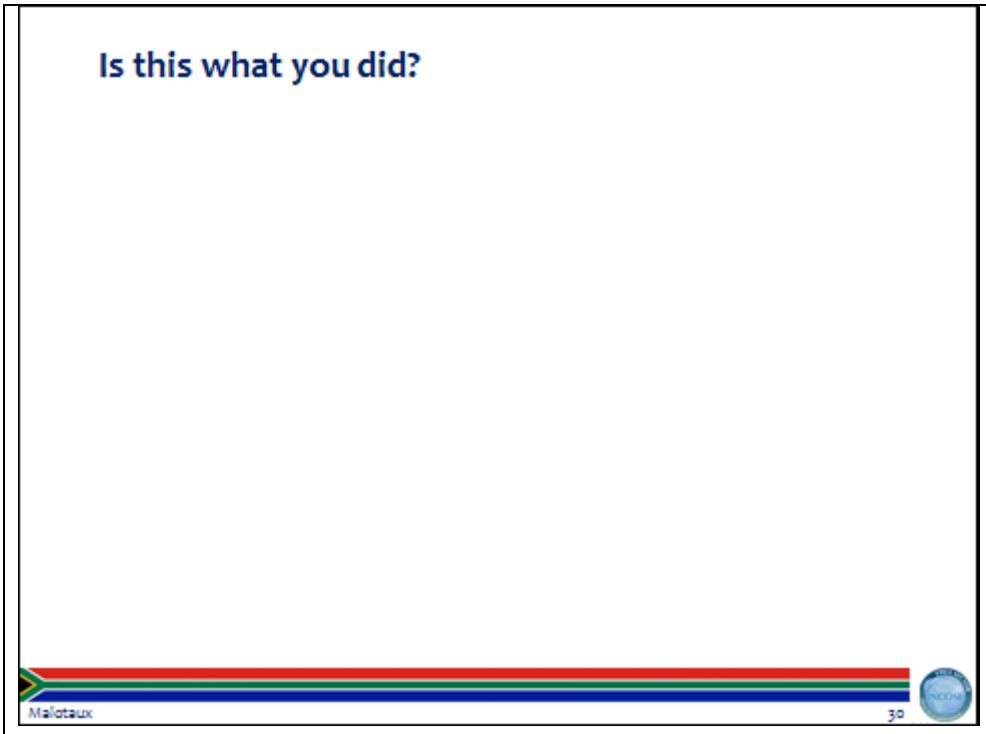
Malotaux 29


Is this what you did?
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Defect rate
• Before test ?
• After test ?
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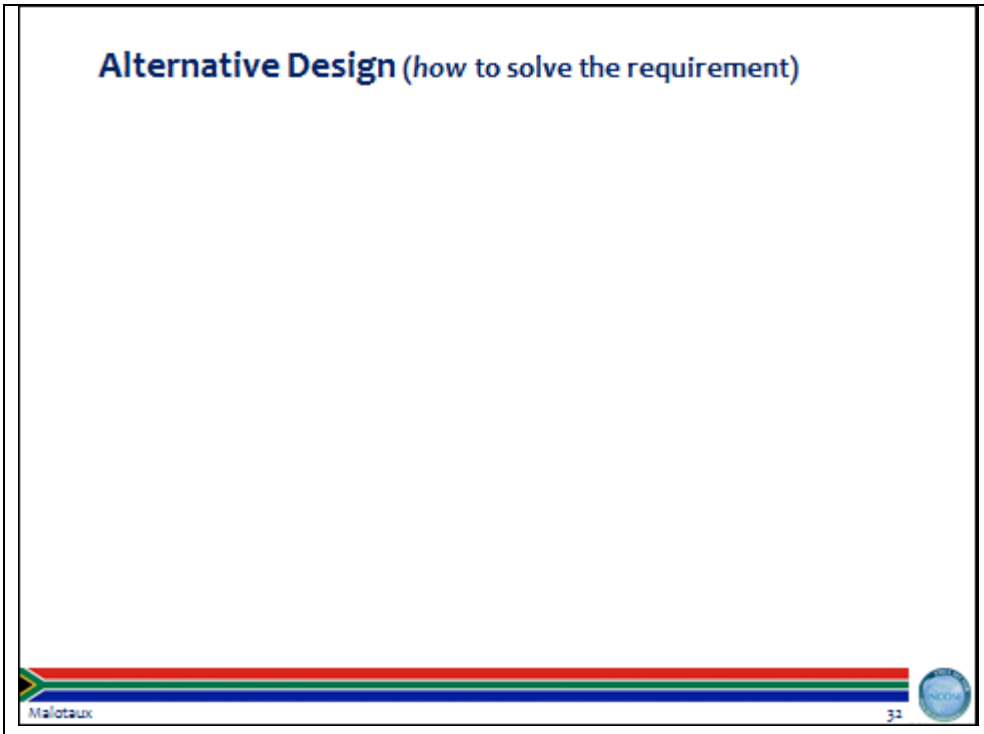
Alternative Design (how to solve the requirement)
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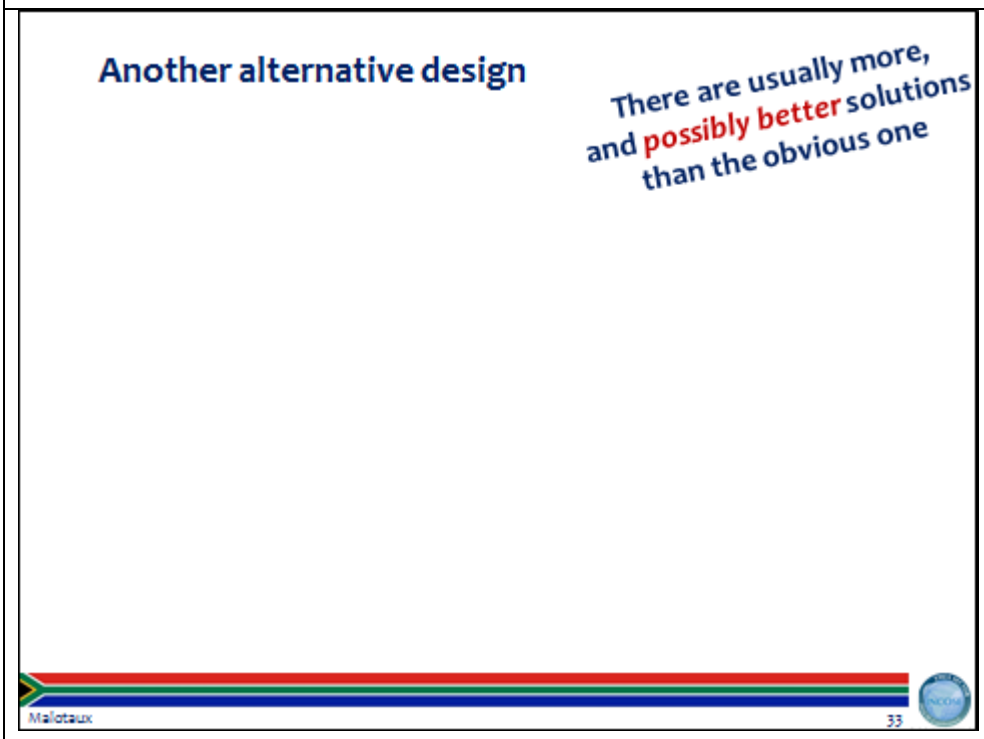
Another alternative design
There are usually more,
and possibly better solutions
than the obvious one
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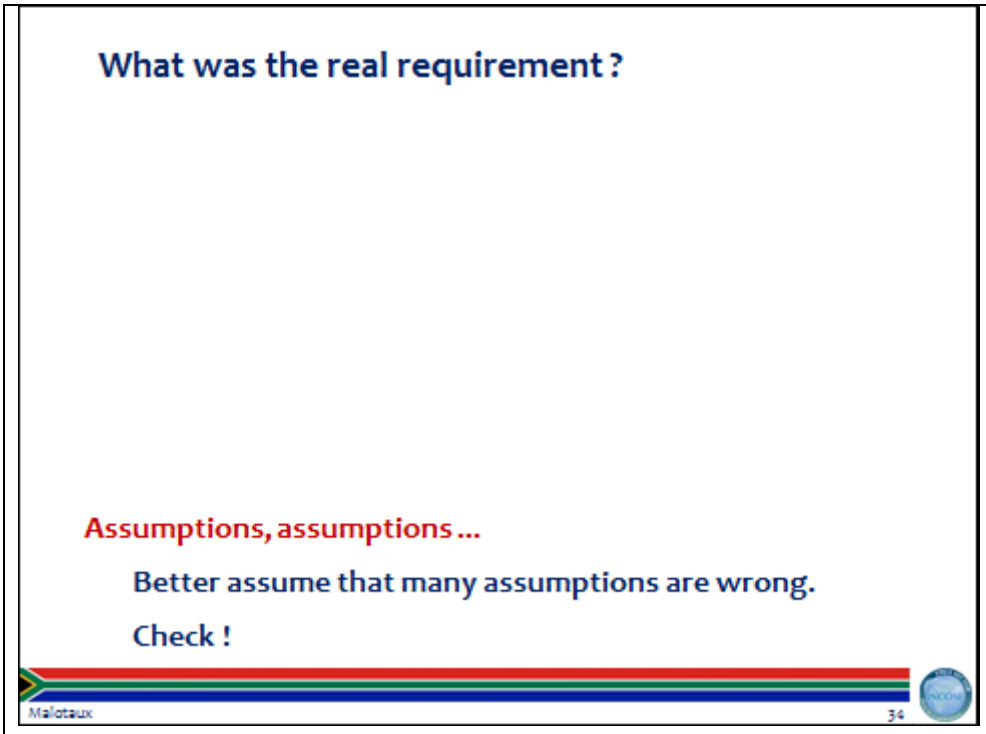
What was the real requirement ?
Assumptions, assumptions ...
Better assume that many assumptions are wrong.
Check !
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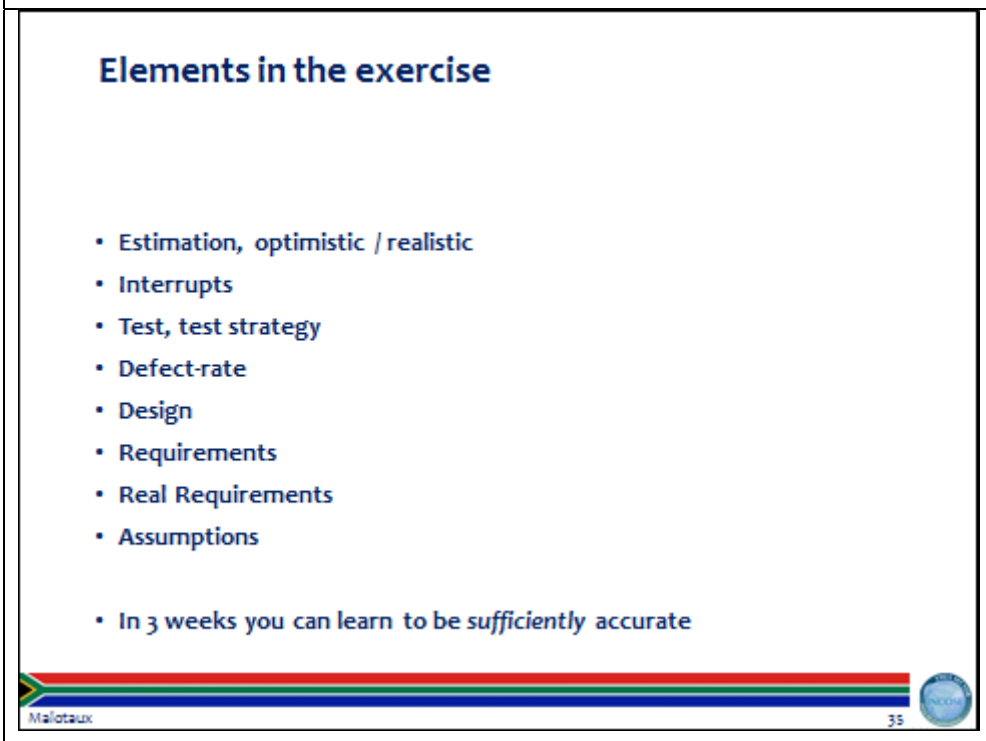
Elements in the exercise
• Estimation, optimistic / realistic
• Interrupts
• Test, test strategy
• Defect-rate
• Design
• Requirements
• Real Requirements
• Assumptions
• In 3 weeks you can learn to be sufficiently accurate
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Project Life Cycles

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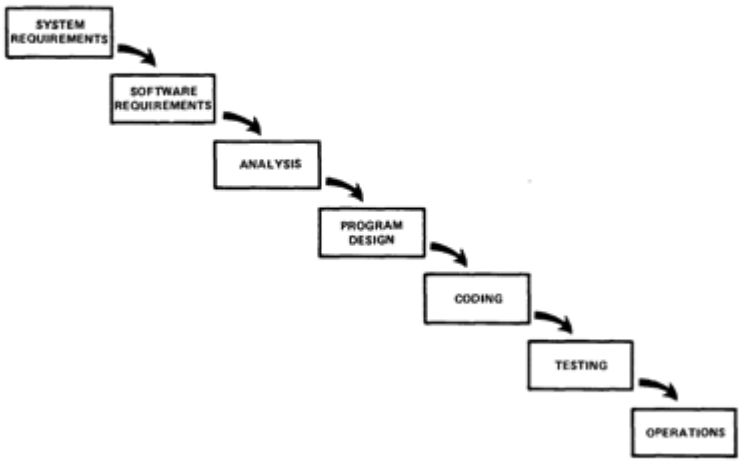
Waterfall ?

Winston Royce 1970



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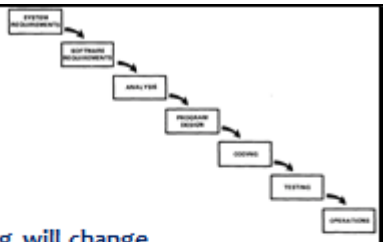
When can we use waterfall?



- Requirements are completely clear, nothing will change
- We've done it may times before
- Everybody knows exactly what to do
- We call this *production*
  Even most production doesn't run smoothly the first time, it has to be tuned

- In your projects:
  - Is everything completely clear?
  - Will nothing change?
  - Does everybody know exactly what to do?
  - Are you sure?

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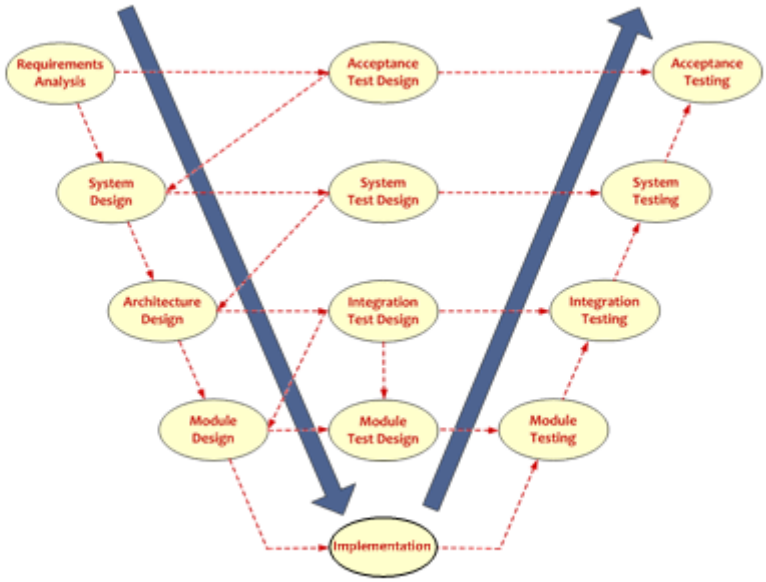
V-Model



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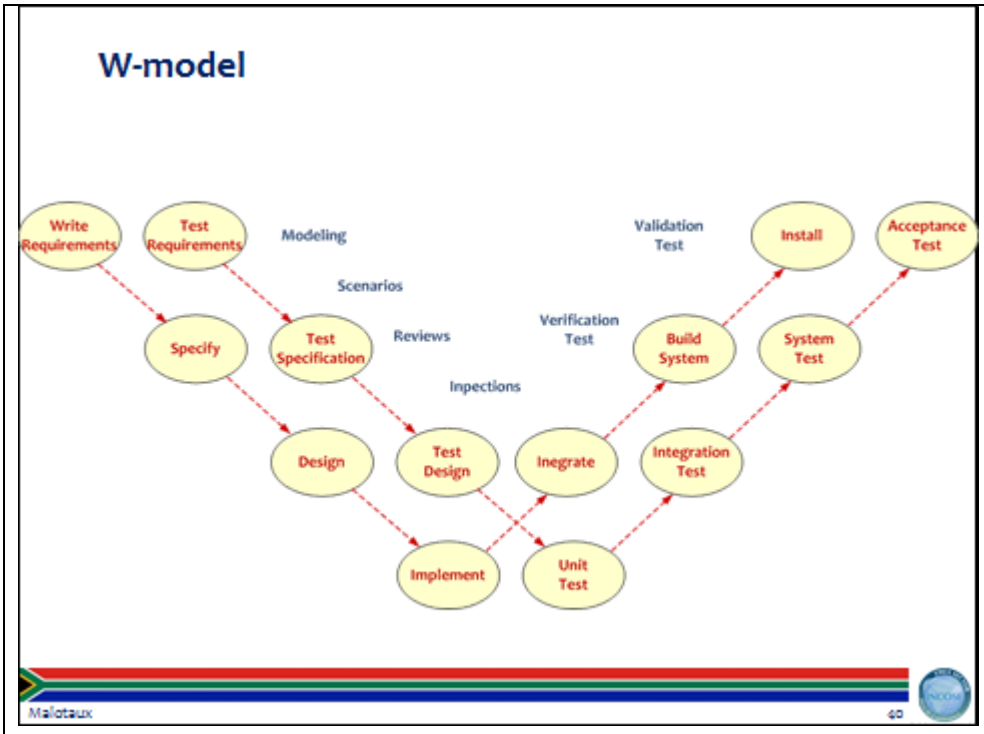

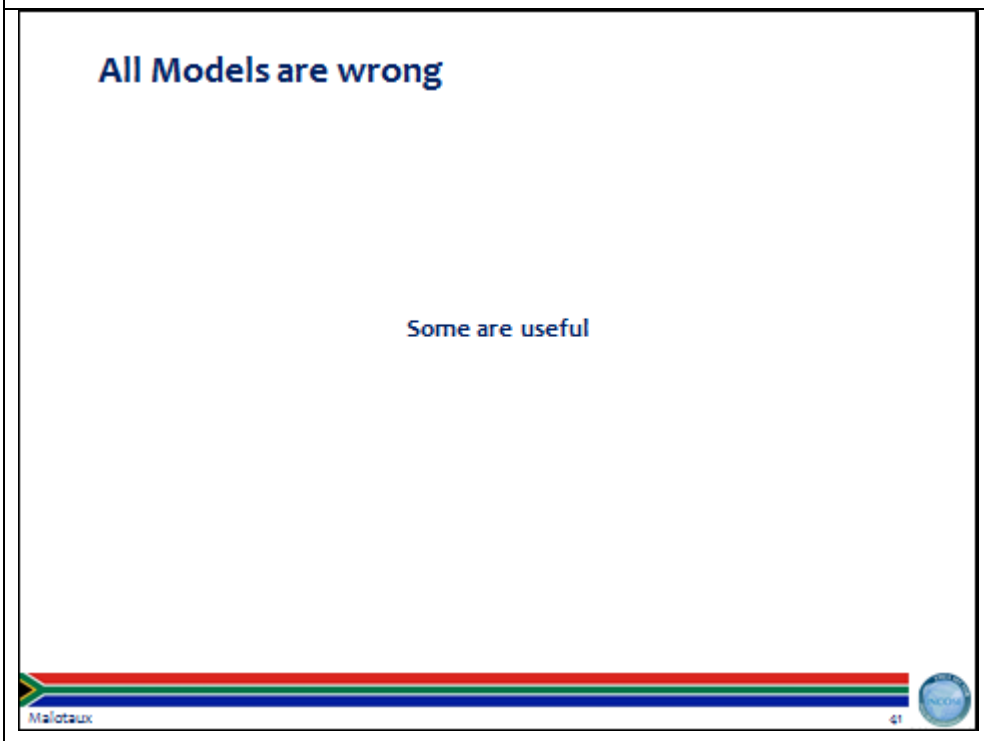

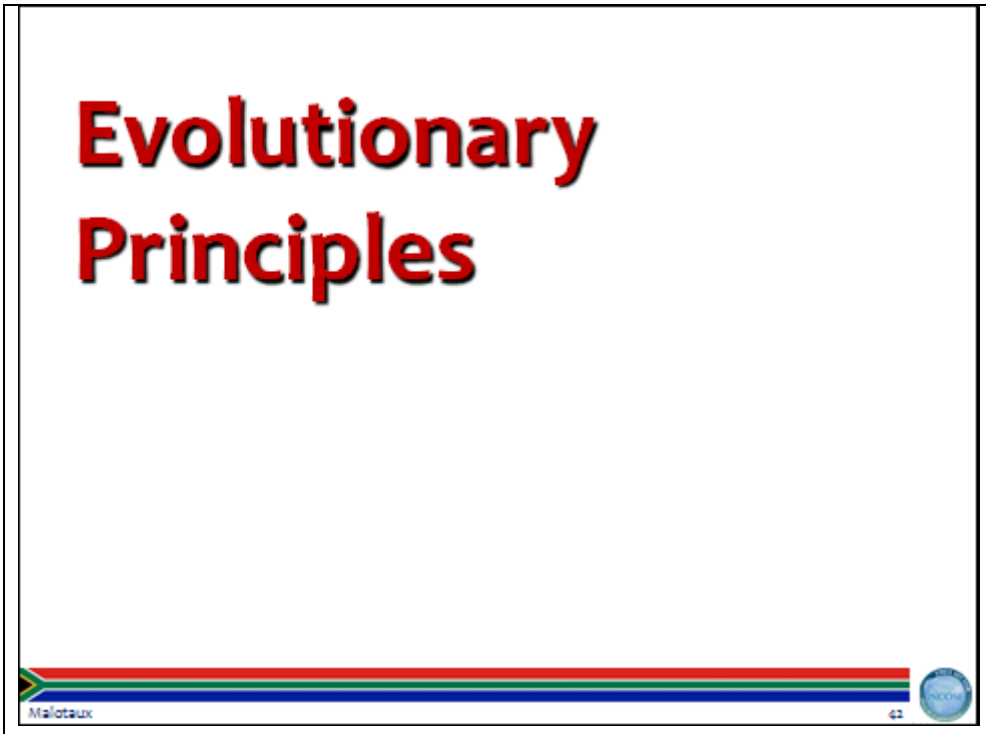
Evolutionary
Principles
Malotaux
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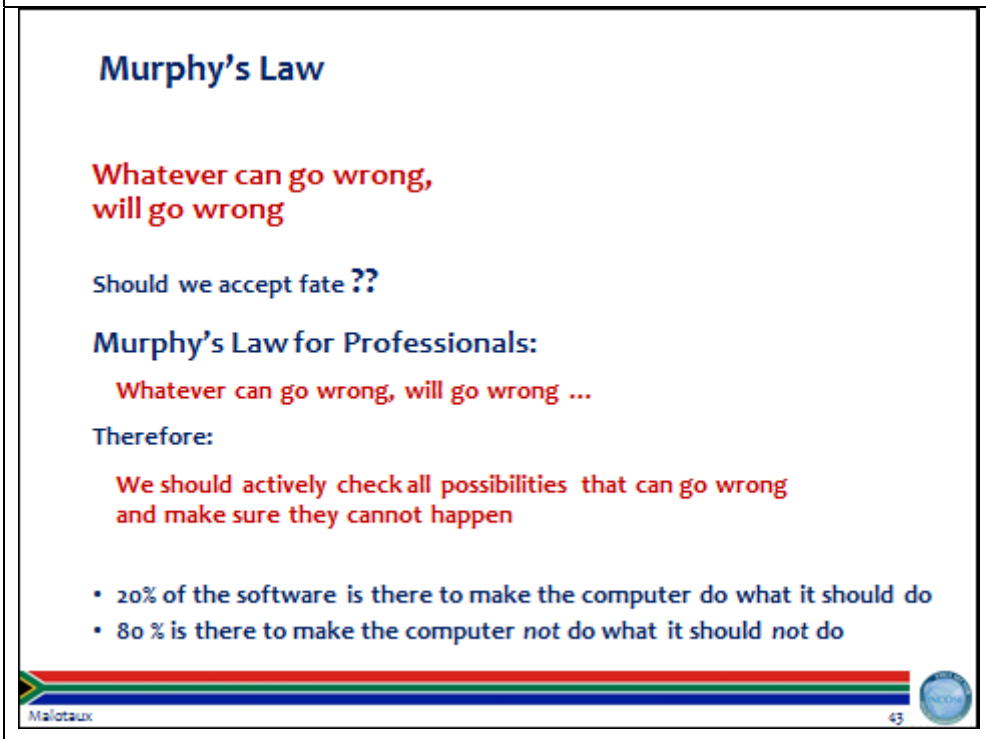
Murphy's Law
Whatever can go wrong,
will go wrong
Should we accept fate ??
Murphy's Law for Professionals:
Whatever can go wrong, will go wrong ...
Therefore:
We should actively check all possibilities that can go wrong
and make sure they cannot happen
• 20% of the software is there to make the computer do what it should do
• 80 % is there to make the computer not do what it should not do
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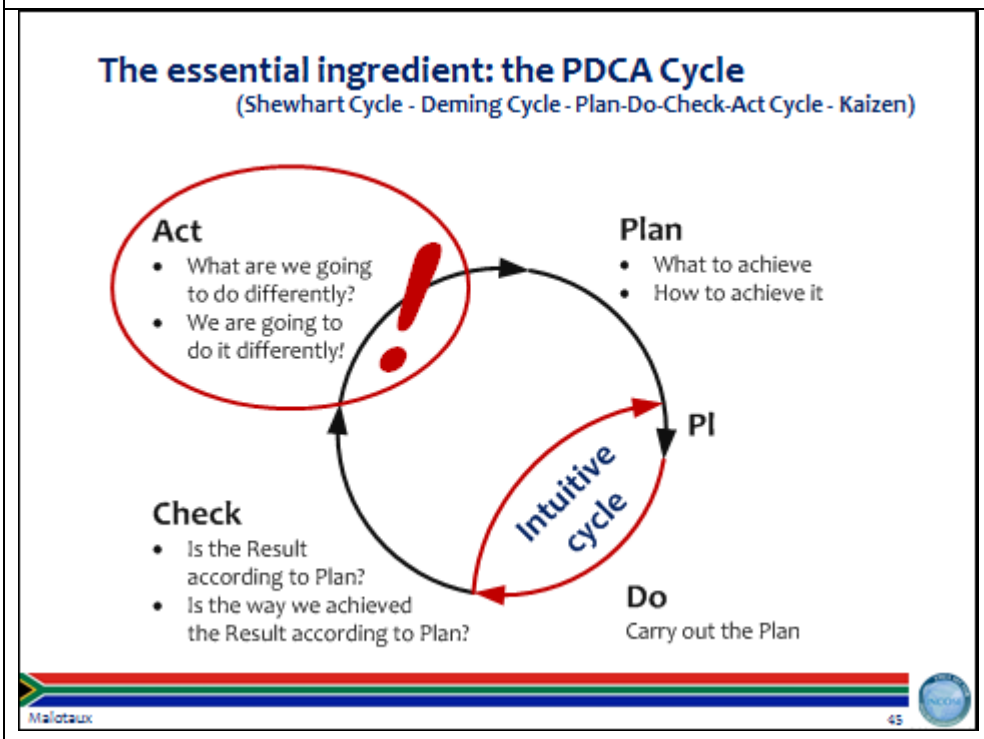

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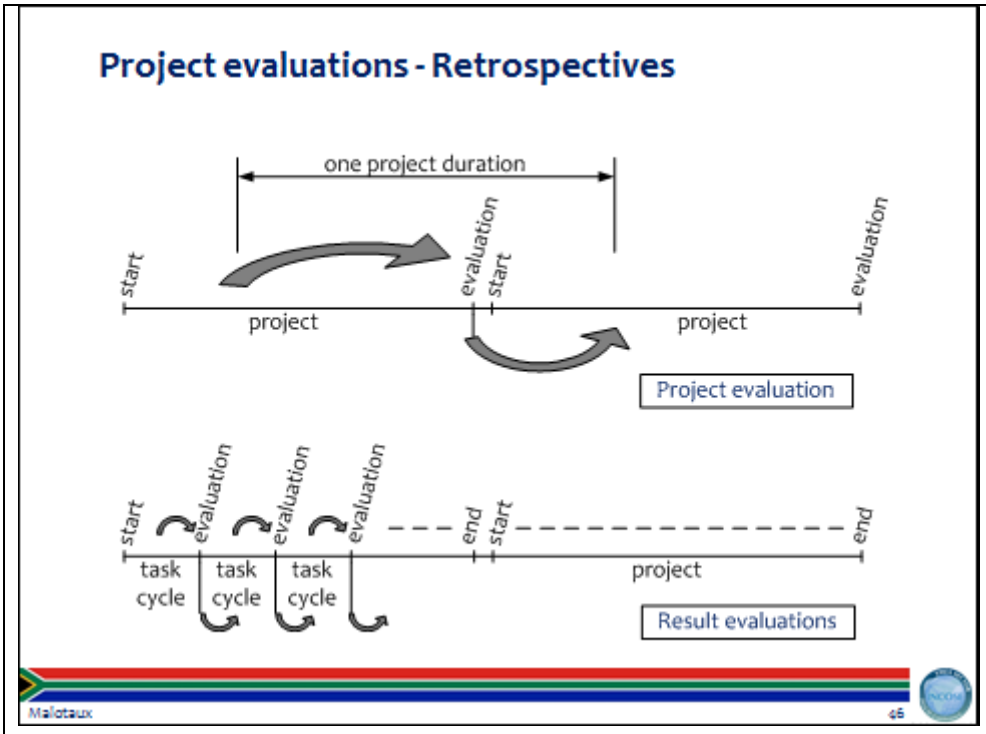

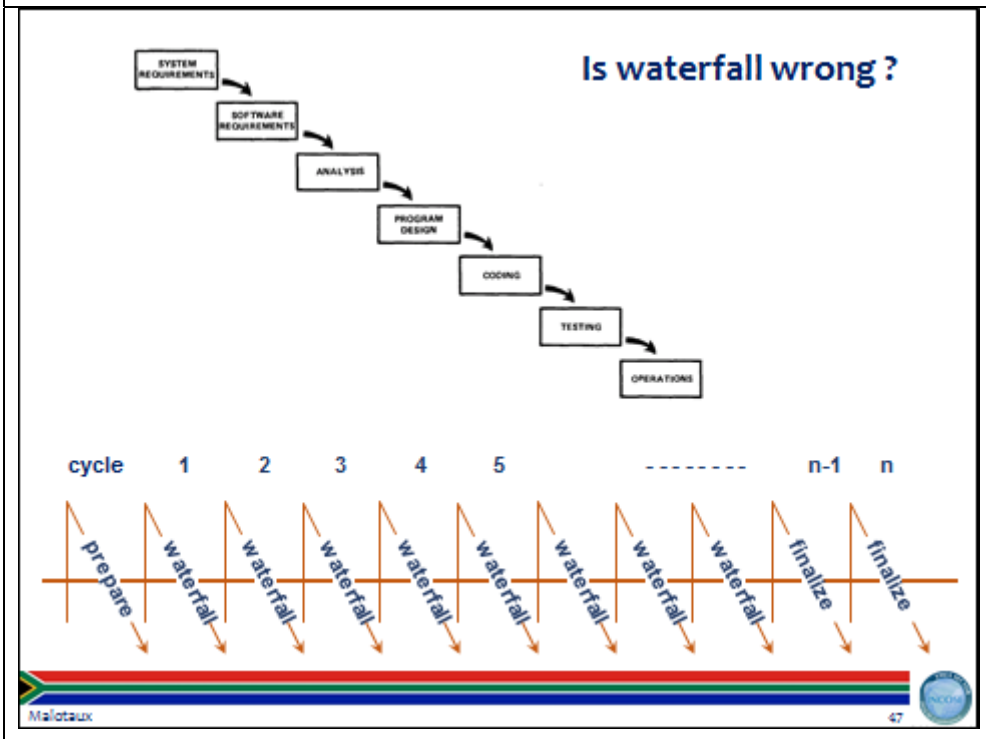

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Time-honoured knowledge how to achieve the goal

If we

- Use very short Plan-Do-Check-Act cycles
- Constantly selecting the most important things to do

doing the right things

then we can

- Most quickly learn what the real requirements are
- Learn how to most effectively and efficiently realize these requirements

and we can

- Spot problems quicker, allowing more time to do something about them

doing the right things right

Malotaux 48

Evo

- Evo (short for Evolutionary...) uses PDCA consistently
- Applying the PDCA-cycle actively, deliberately, rapidly and frequently, for *Product*, *Project* and *Process*, based on ROI and highest value
- Combining Planning, Requirements- and Risk-Management into *Result Management*
- We know we are not perfect, but the customer shouldn't be affected
- Evo is about delivering Real Stuff to Real Stakeholders doing Real Things *"Nothing beats the Real Thing"*
- Projects seriously applying Evo, routinely conclude successfully on time, or earlier

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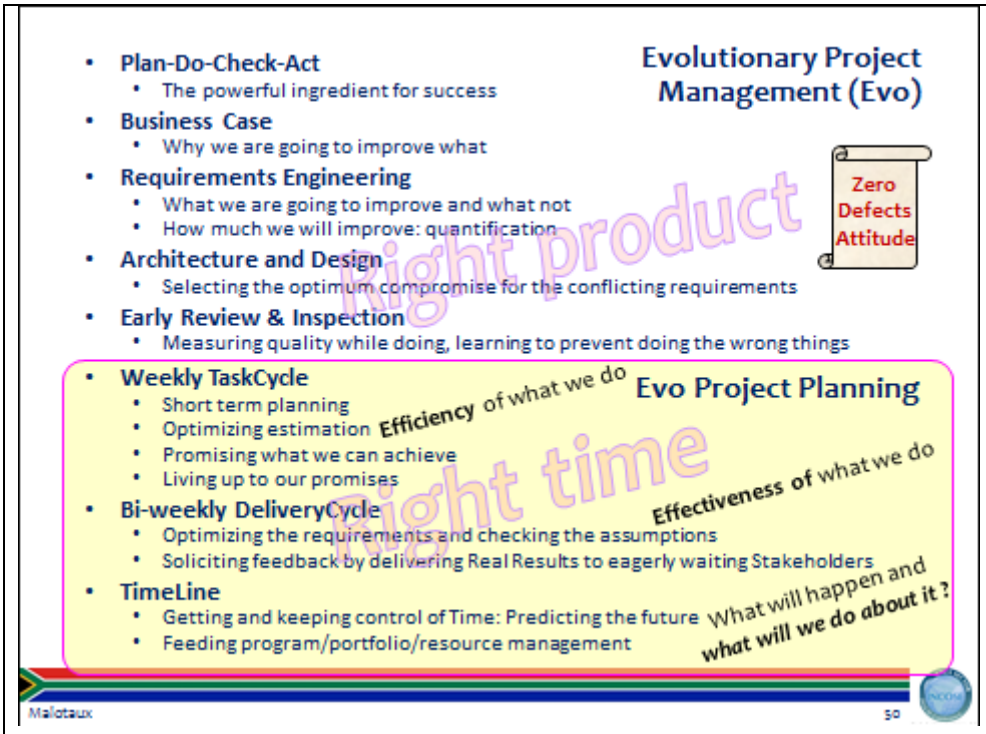

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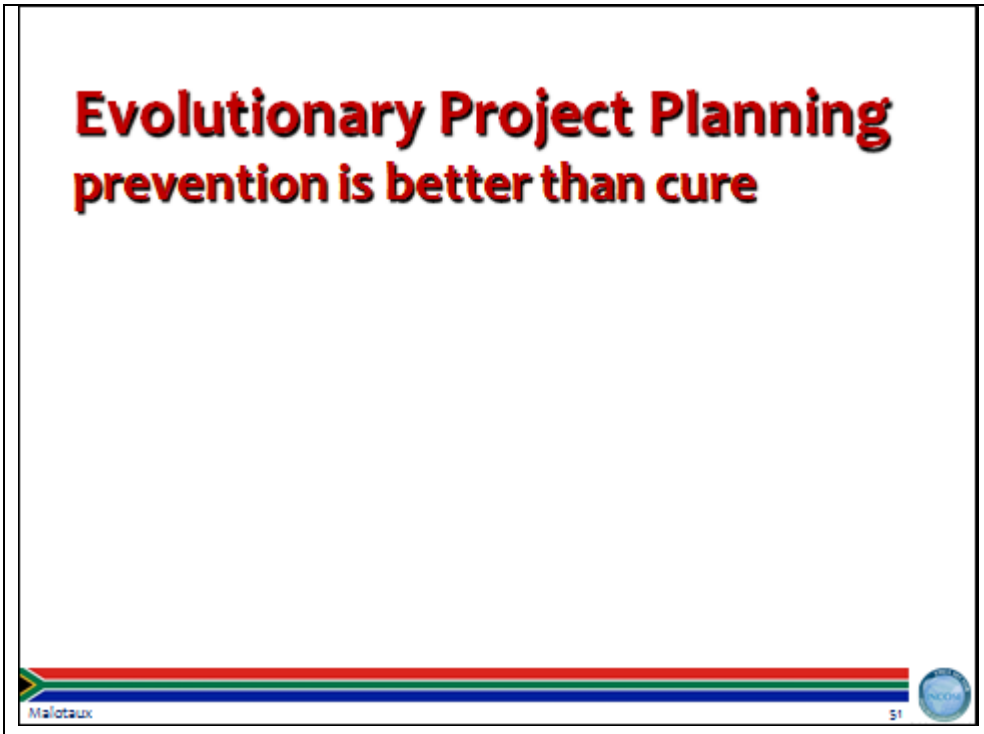

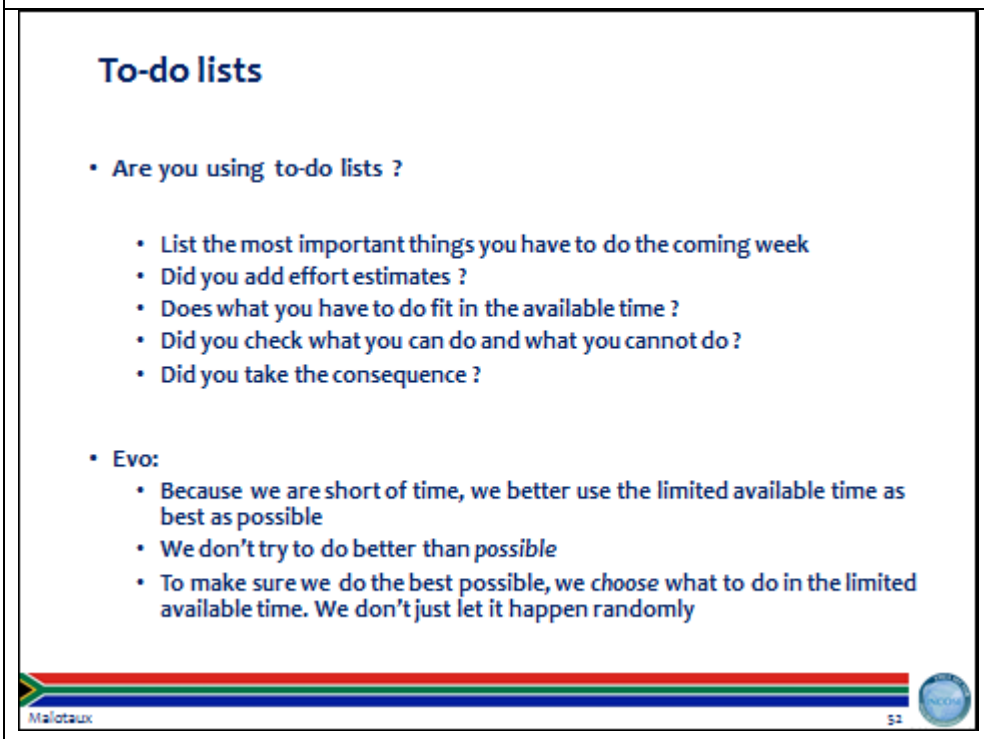

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Evo Planning: Weekly TaskCycle

- Are we *doing* the right things, in the right order, to the right level of detail for now
- Optimizing estimation, planning and tracking abilities to better predict the future
- Select highest priority tasks, never do any lower priority tasks, never do undefined tasks
- There are only about 26 plannable hours in a week (2/3)
- In the remaining time: do whatever else you have to do
- Tasks are always done, 100% done

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Effort and Lead Time

- Days estimation → lead time (calendar time)
- Hours estimation → effort
- Effort variations and lead time variations have different causes
- Treat them differently and keep them separate
  - Effort: complexity
  - Lead Time: time-management
    - (effort / lead-time ratio)

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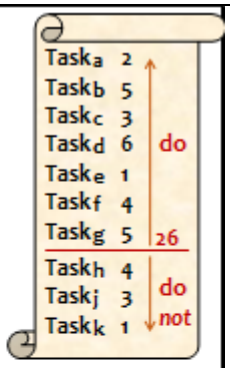
Every week we plan



- How much time do we have available
- 2/3 of available time is net plannable time
- What is most important to do
- Estimate effort needed to do these things
- Which most important things fit in the net available time (default 26 hr per week)
- What can, and are we going to do
- What are we not going to do

2/3 is default start value
this value works well in development projects

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Weekly 3-Step Procedure

- **Individual preparation**
  - Conclude current tasks
  - What to do next
  - Estimations
  - How much time available
- **Modulation with / coaching by Project Management (1-on-1)**
  - Status (all tasks done, completely done, not to think about it any more ?)
  - Priority check (are these really the most important things ?)
  - Feasibility (will it be done by the end of the week ?)
  - Commitment and decision
- **Synchronization with group (team meeting)**
  - Formal confirmation (this is what we plan to do)
  - Concurrency (do we have to synchronize ?)
  - Learning
  - Helping
  - Socializing

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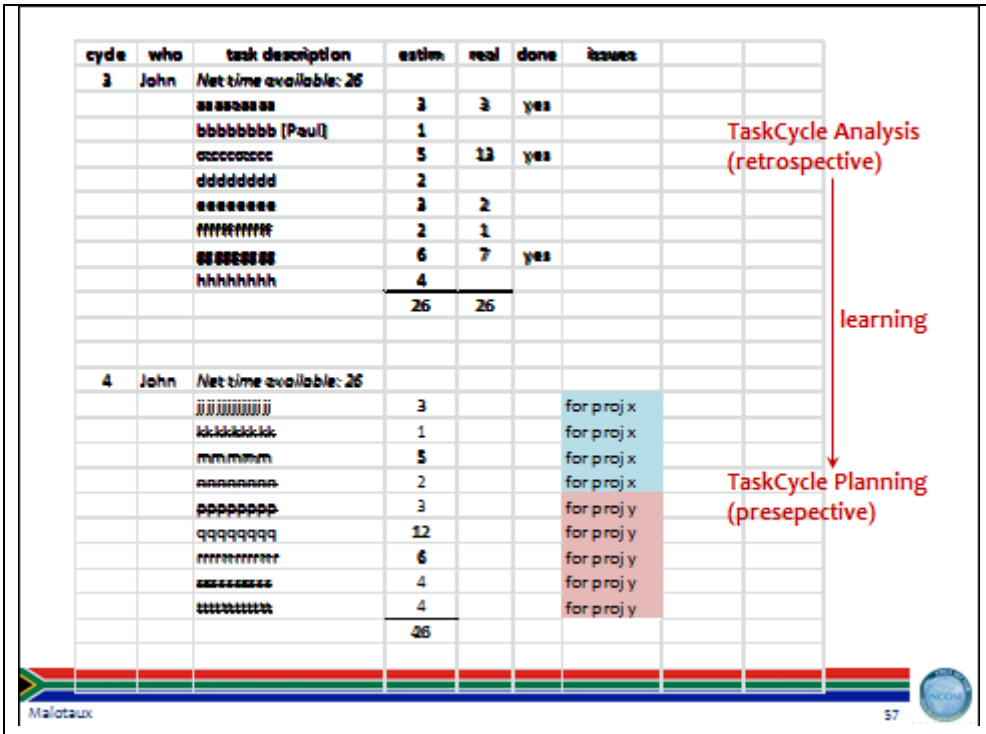

cycle	who	task description	estim	real	done	issues
3	John	Net time available: 26				
		aaaaaaaa	3	3	yes	
		bbbbbbbb (Paul)	1			
		cccccccc	5	13	yes	
		dddddddd	2			
		eeeeeeee	3	2		
		ffffffffff	2	1		
		gggggggg	6	7	yes	
		hhhhhhhh	4			
			26	26		
4	John	Net time available: 26				
		jjjjjjjjjjjj	3			for proj x
		kkkkkkkkk	1			for proj x
		mmmmm	5			for proj x
		nnnnnnnn	2			for proj x
		pppppppp	3			for proj y
		qqqqqqqq	12			for proj y
		rrrrrrrrrrr	6			for proj y
		ssssssssss	4			for proj y
		tttttttttt	4			for proj y
			46			

TaskCycle Analysis (retrospective)

learning

TaskCycle Planning (presepective)

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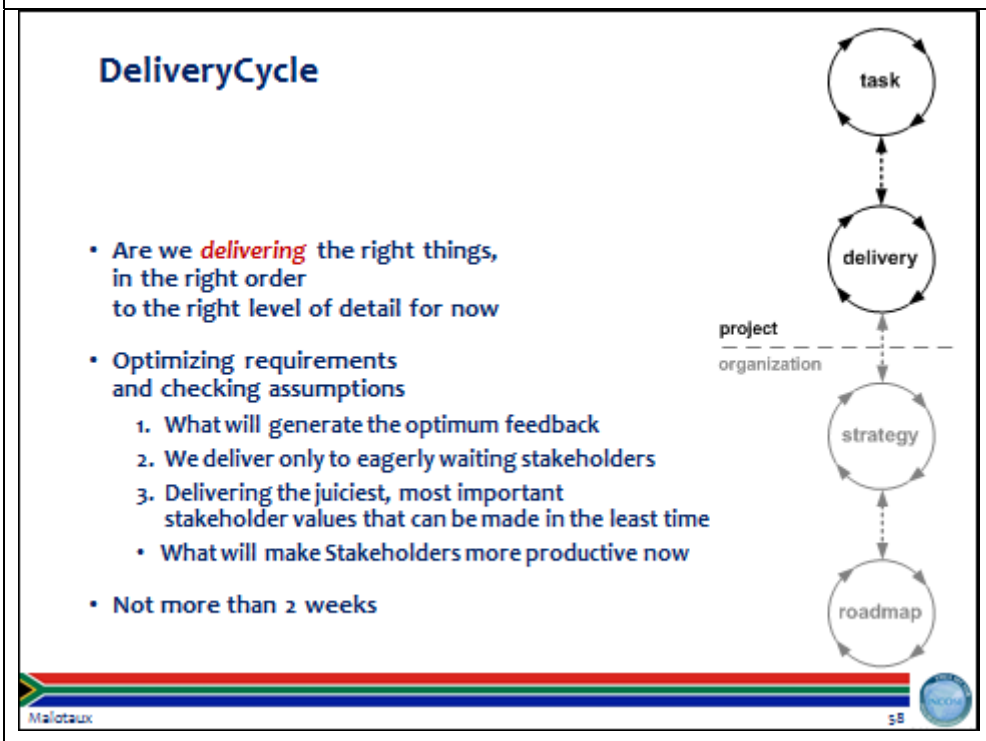


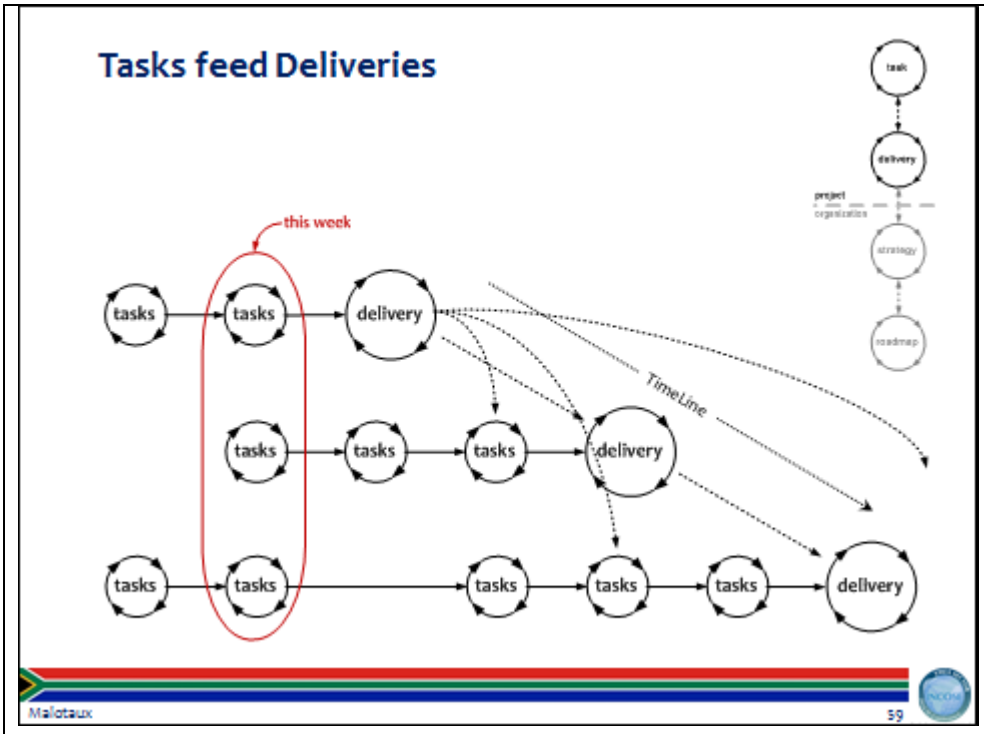
DeliveryCycle

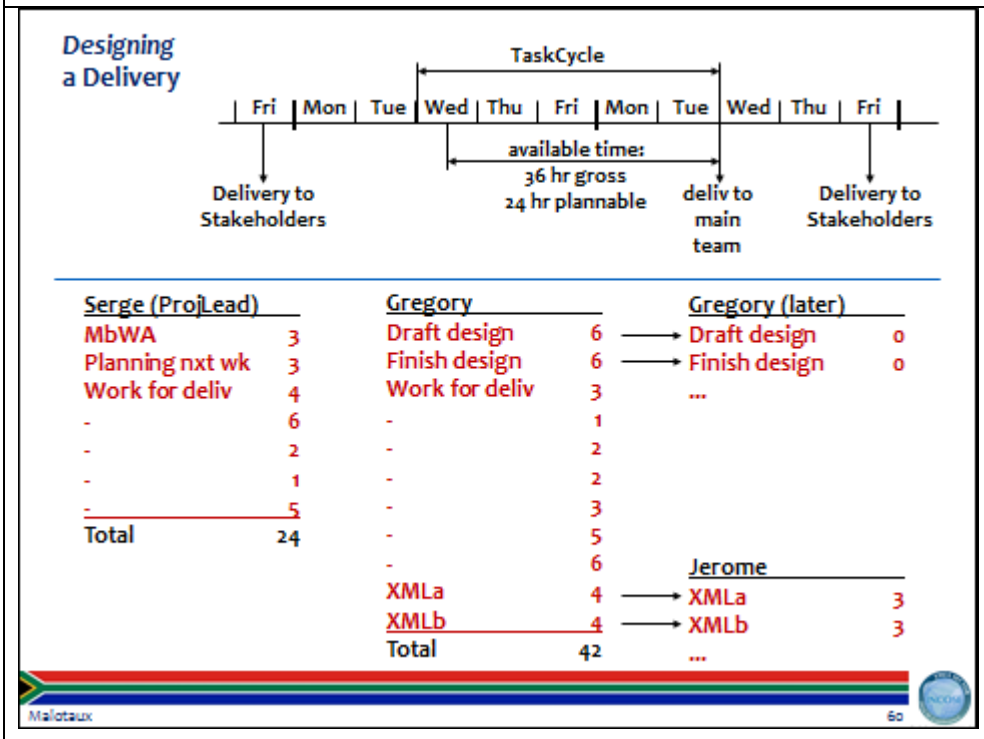
- Are we *delivering* the right things, in the right order to the right level of detail for now
- Optimizing requirements and checking assumptions
  1. What will generate the optimum feedback
  2. We deliver only to eagerly waiting stakeholders
  3. Delivering the juiciest, most important stakeholder values that can be made in the least time
  - What will make Stakeholders more productive now
- Not more than 2 weeks

Malotaux 58

Niels Malotaux

If space systems engineers could learn how to meet any deadline, couldn't you too?





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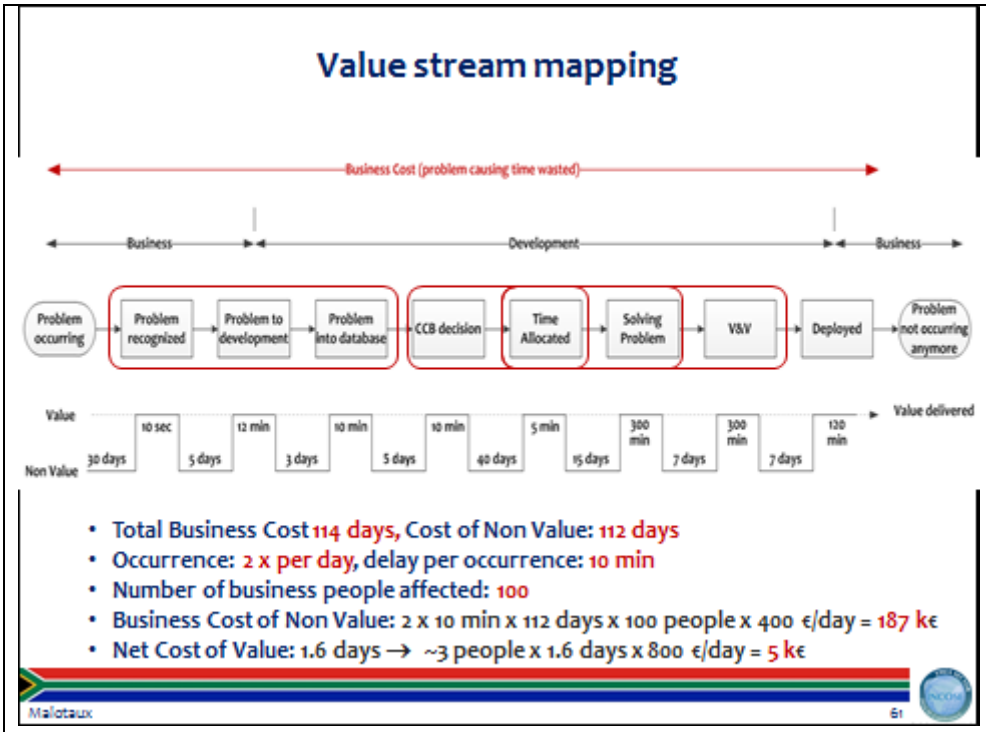
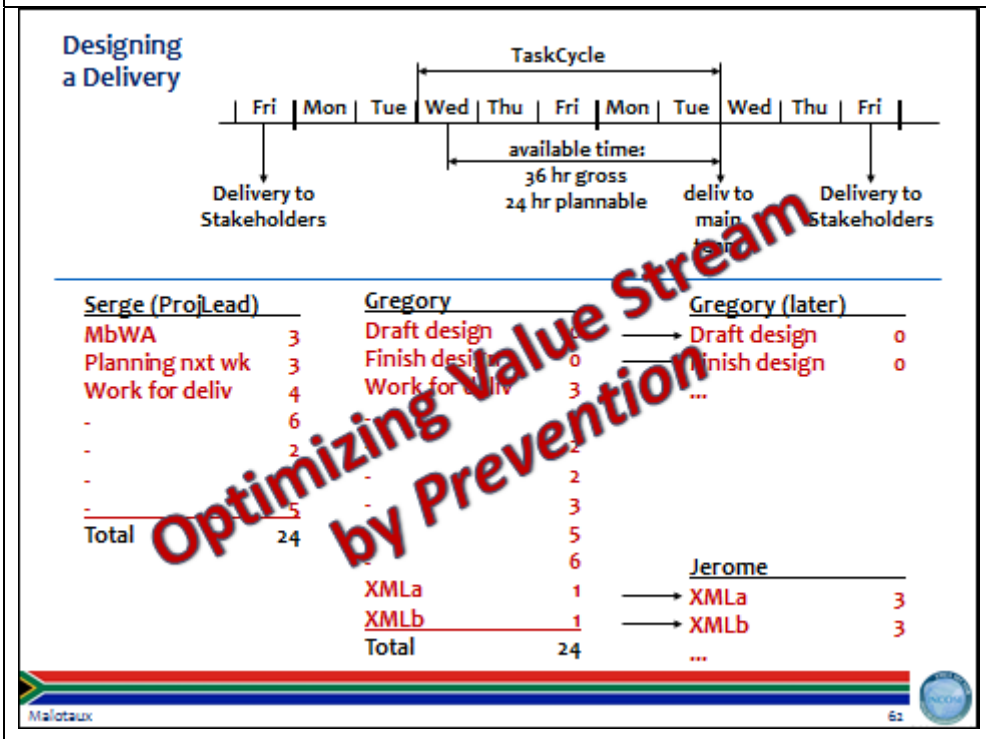
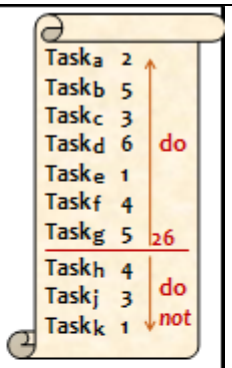




TaskCycle Exercise



- How much time do you have available
- 2/3 of available time is net plannable time
- What is most important to do (update your list)
- Estimate effort needed to do these things
- Which most important things fit in the net available time (default 26 hr)
- What can you do, and what are you going to do
- What are you *not* going to do
- Why ?

Malotaux 63

Now we are already much more efficient

- Organizing the work in very short cycles
- Making sure we are doing the right things
- Doing the right things right
- Continuously optimizing (what not to do)
- So, we already work more efficiently

but ...

- How do we make sure the whole project is done on time ?

Malotaux 64

Niels Malotaux

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TimeLine

How to make sure we get

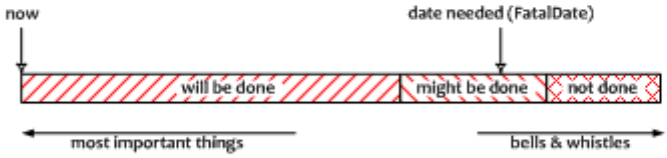
the Right Results at the Right Time

Malotaux 65

TimeLine

What the customer wants, he cannot afford

Standard Projects



Evo

Better 80% 100% done, than 100% 80% done
Let it be the most important 80%

Malotaux 66

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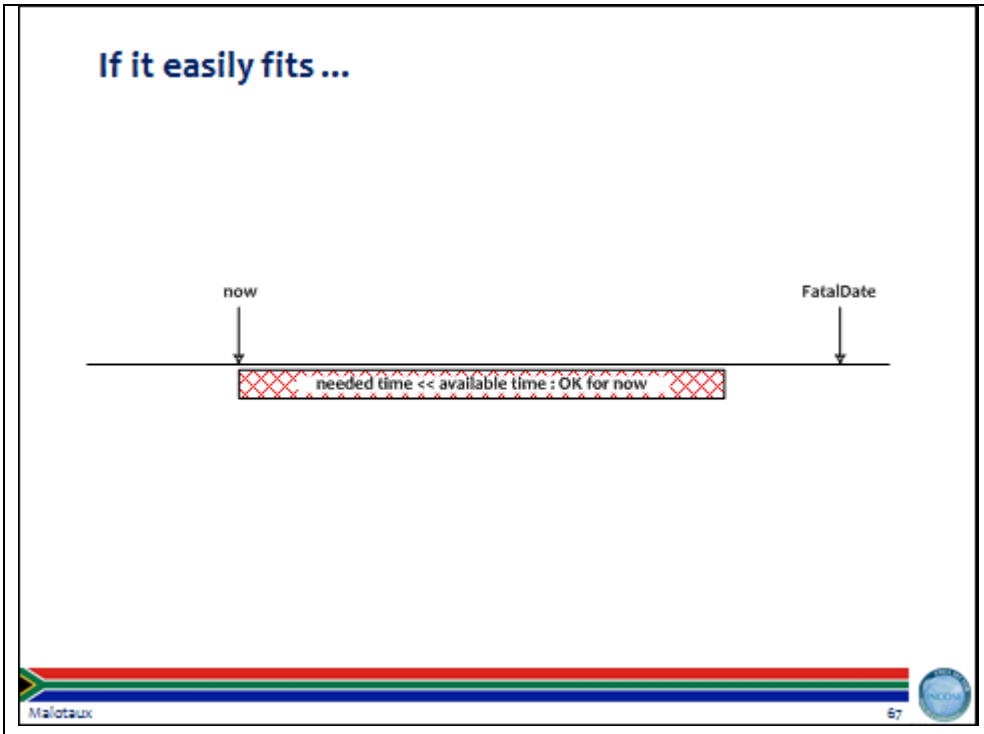

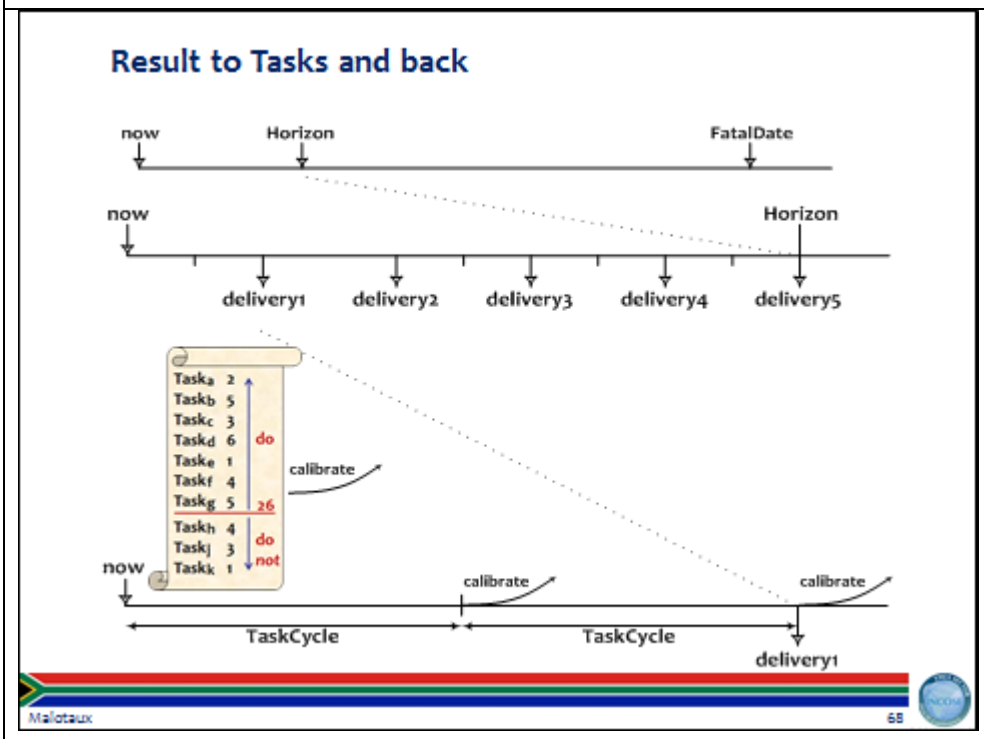

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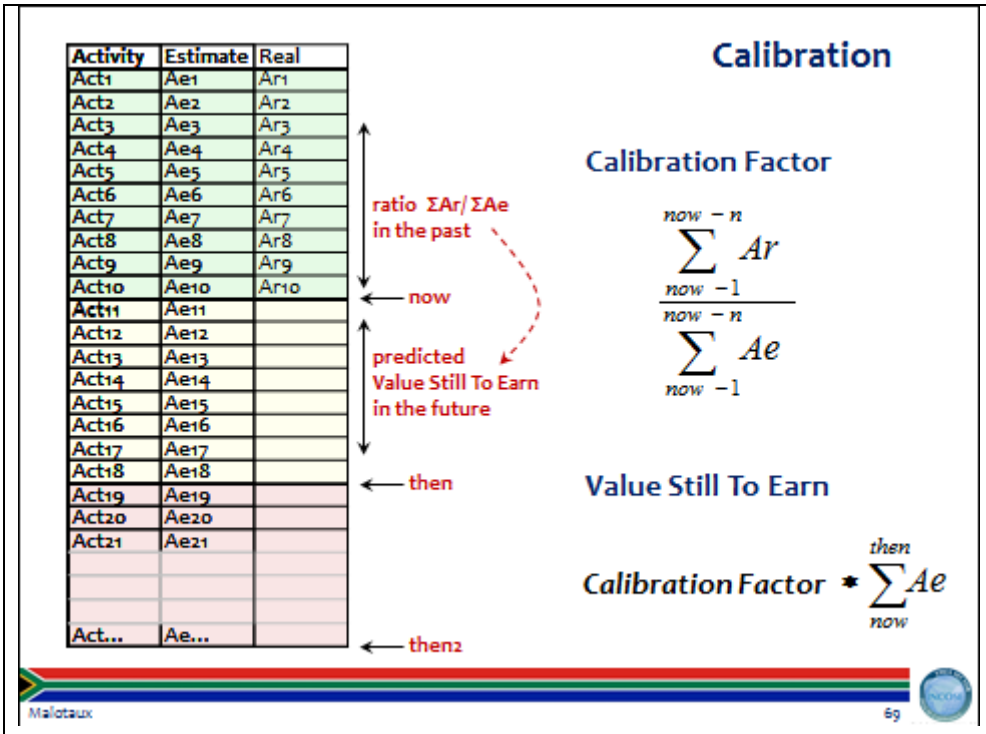

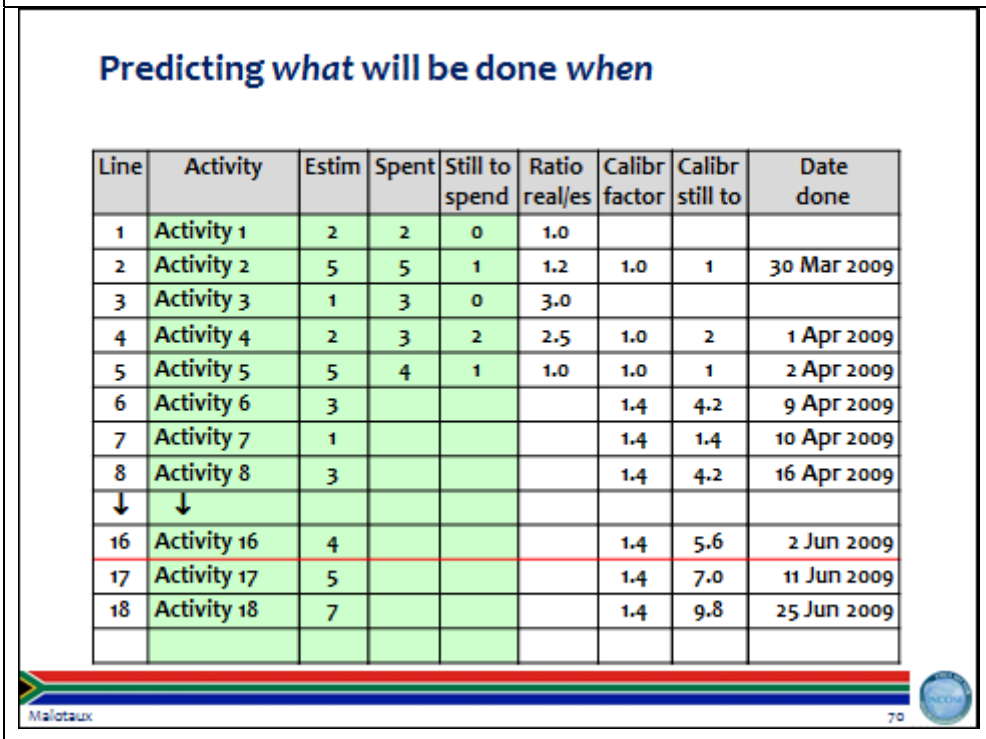

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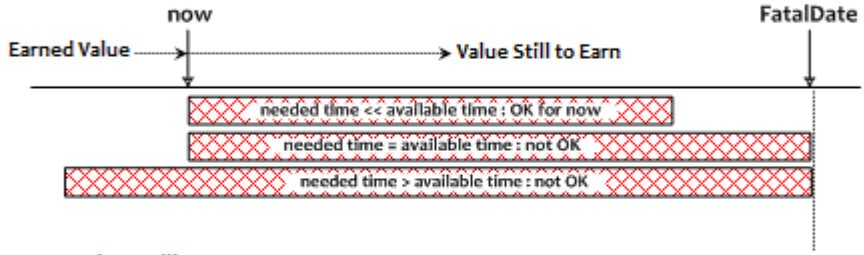
What do we do if we see we won't make it on time?



- Value Still to Earn

versus

- Time Still Available

If the match is over, you cannot score a goal

Malotaux 71

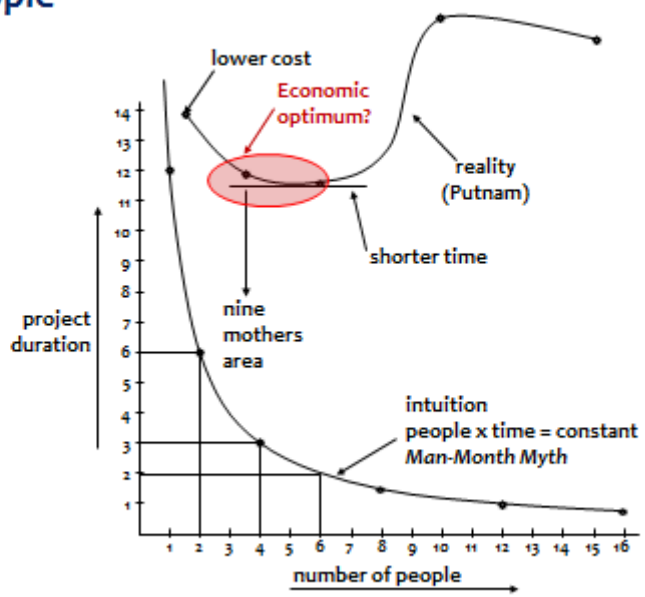
Deceptive options

- Hoping for the best (fatalistic)
- Going for it (macho)
- Working overtime (fooling ourselves)
- 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

Intuition often guides us in the wrong direction

Malotaux 72

Adding people



Brooks' Law (1975)
Adding people to a late project makes it later

Malotaux 73

Saving time

Continuous elimination of waste

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
  - Not doing what later proves to be superfluous
- Efficiency in *how* we do it - doing things differently
  - The product
    - Using proper and most efficient solution, instead of the solution we always used
  - The project
    - Doing the same in less time, instead of immediately doing it the way we always did
  - Continuous improvement and prevention processes
    - Constantly learning doing things better and overcoming bad tendencies
- Efficiency in *when* we do it - right time, in the right order
- TimeBoxing - much more efficient than FeatureBoxing

Malotaux 74

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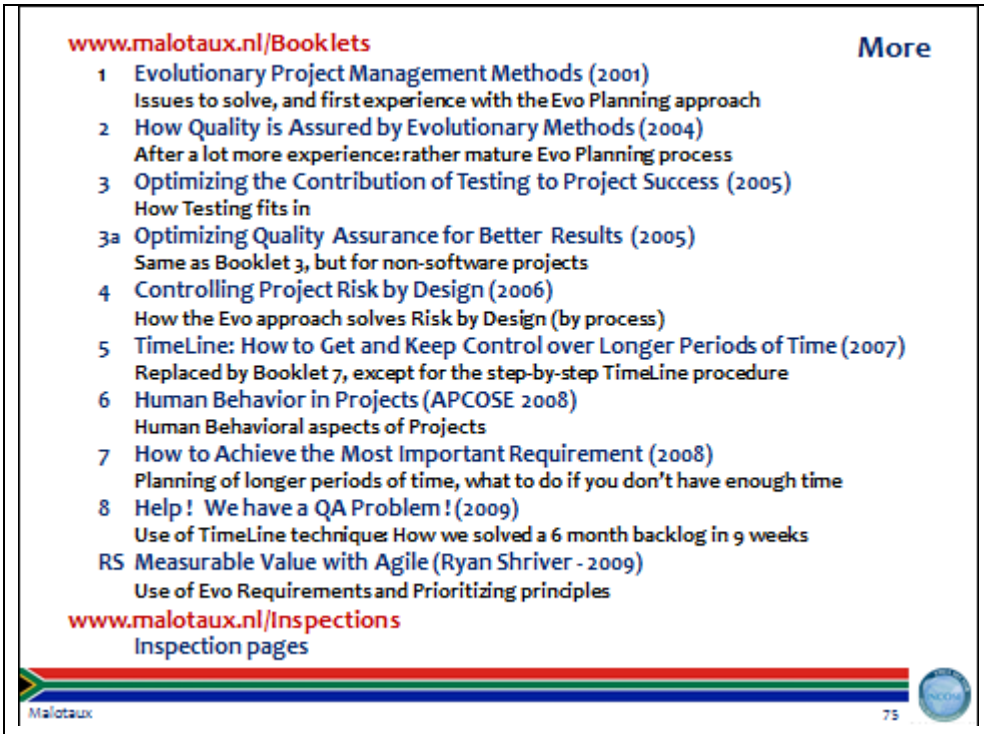

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If we add something …

If we add something, something else will not be done

Rather than letting it happen randomly

We better decide what will happen

Malotaux 77

Active Synchronization

Somewhere around you, there is the bad world.

If you are waiting for a result outside your 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

Malotaux 78

Interrupts

- Boss comes in: "Can you paint the fence?"
- What do you do?

- In case of interrupt, use the interrupt procedure

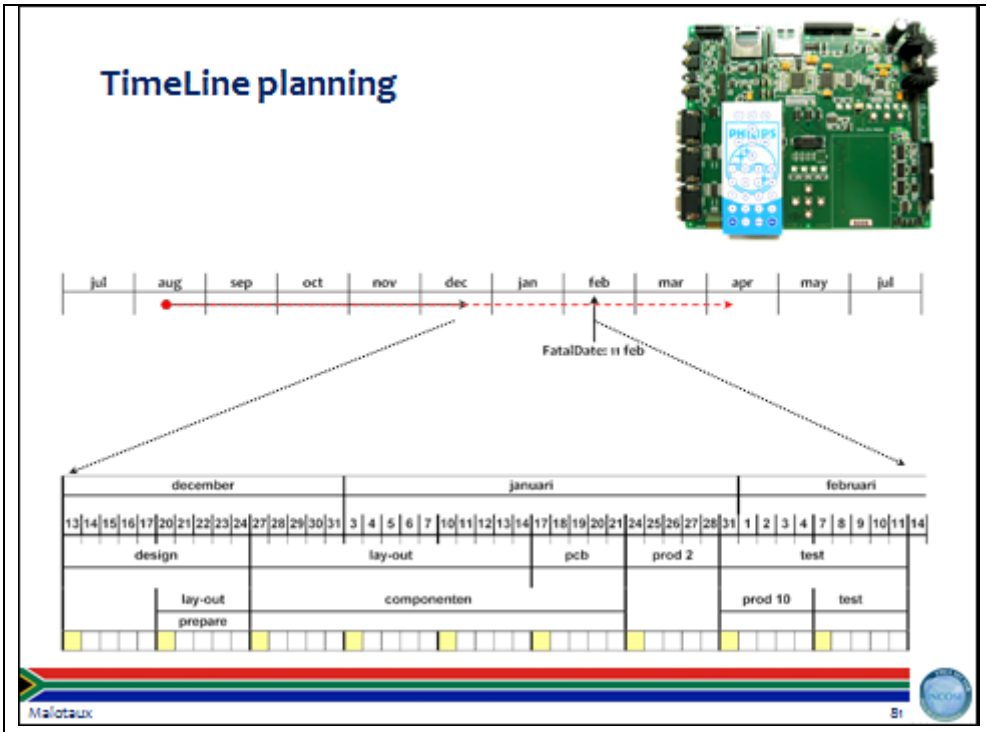
Malotaux 79

Interrupt Procedure "We shall work only on planned Tasks"

If a new task suddenly appears in the middle of a Task Cycle
(we call this an Interrupt) we follow this procedure:

1. Define the expected Results of the new Task properly
2. Estimate the time needed to perform the new Task, to the level of detail really needed
3. Go to your task planning tool (many projects use the ETA tool)
4. Decide which of the planned Tasks is/are going to be sacrificed (up to the number of hours needed for the new Task)
5. Weigh the priorities of the new Task against the Task(s) to be sacrificed
6. Decide which is more important
7. If the new Task is more important: replan accordingly
8. If the new Task is *not* more important, then do not replan and *do not work* on the new Task. Of course the new Task may be added to the Candidate Task List
9. Now we are still working on planned Tasks

Malotaux 80


TimeLine planning
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prepare
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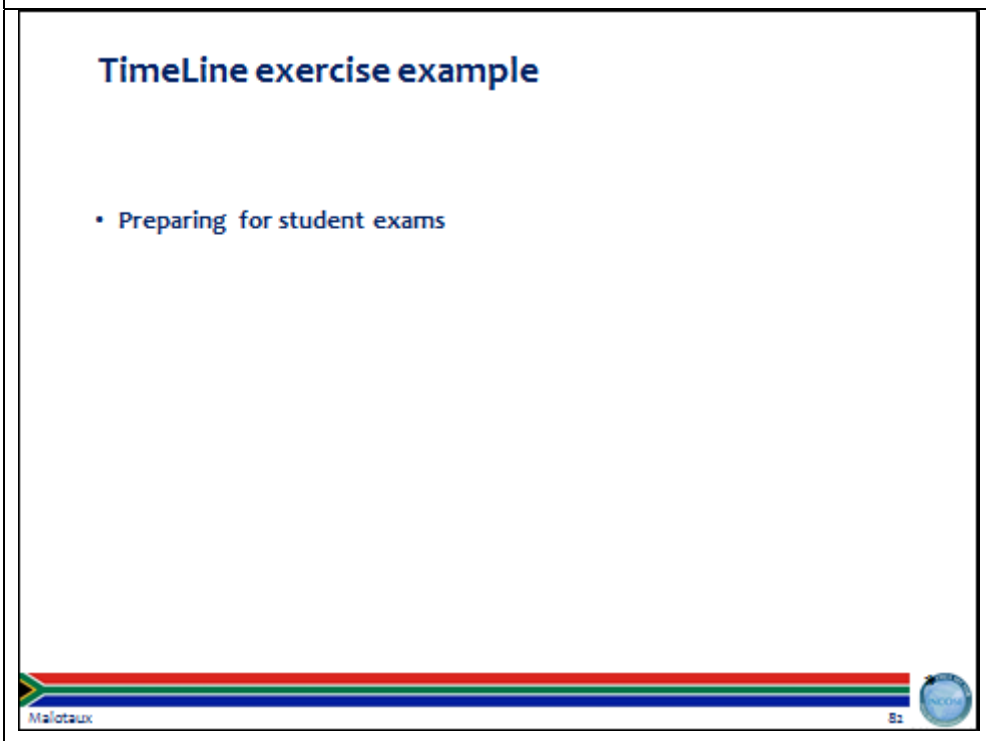
test
Malotaux
81


TimeLine exercise example
• Preparing for student exams
Malotaux
82

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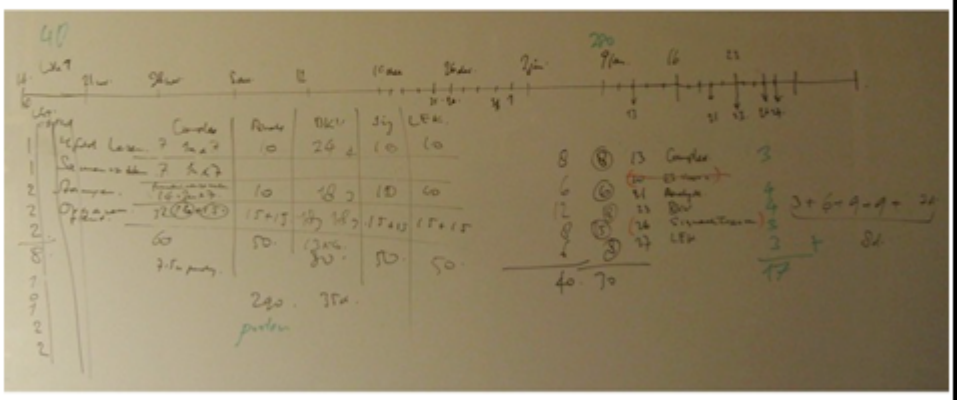
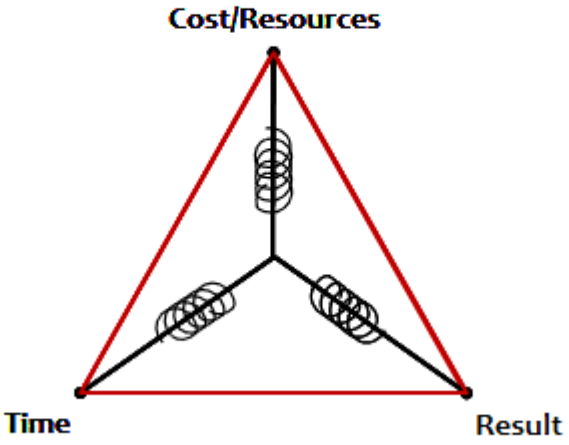
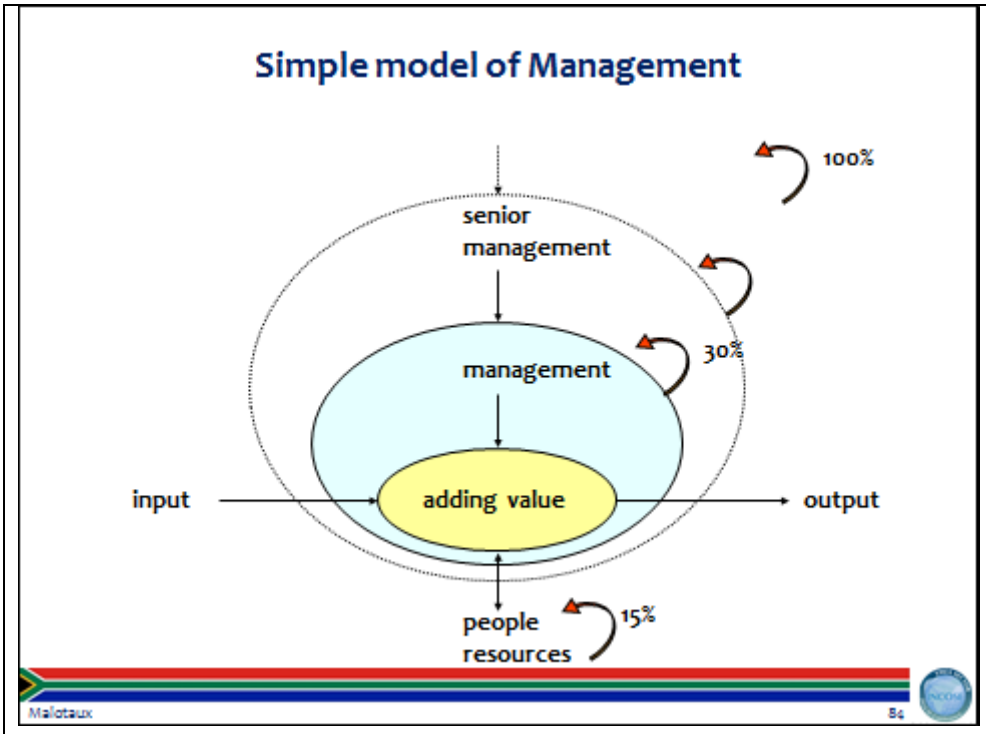
What we did



Iron triangle ?





EMEA Systems Engineering Conference 2014
28 October 2014, Cape Town

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N R Malotaux - Consultancy
tel +49-5632 922 5132
mob +31-655 753 604
fax +49-5632 923 9054
niels@malotaux.nl
www.malotaux.nl