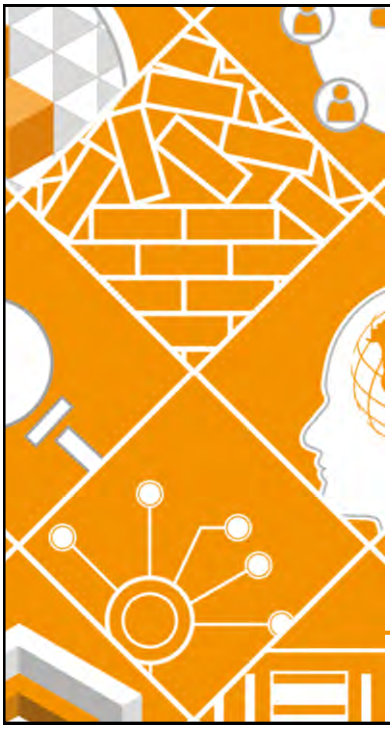

Quality on Time

How Systems Engineers Learned to Meet All Deadlines

Delivered by Niels Malotaux

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SE-T Business Development

Mr. Blaise Nyang

Blaise is an experienced professional in Business Development, Marketing and Sales with extensive hands-on experience in conducting business introduction, growing a client base for companies and evaluating/implementing growth strategies.

Experience:

- Assistant Project Coordinator at BRIWODEV COOP
- Account Relations Officer at NFC Bank
- Research Assistant at EAE Business School and Research Centre
- Marketing and Sales at SHIKS Incs.

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Course Presenter

Mr. Niels Malotaux

Project and Organizational Coach

Helping projects and organizations to quickly become

- More effective - doing the right things better
- More efficient - doing the right things better in less time
- Predictable - delivering as needed

Result Management

Getting projects back on track

Helping with Architecture/Design/Review of Electronics/Firmware/Software

Project Types: Electronic Products, Firmware, Software, Space, Railway, Telecom, Industrial Control, Parking System

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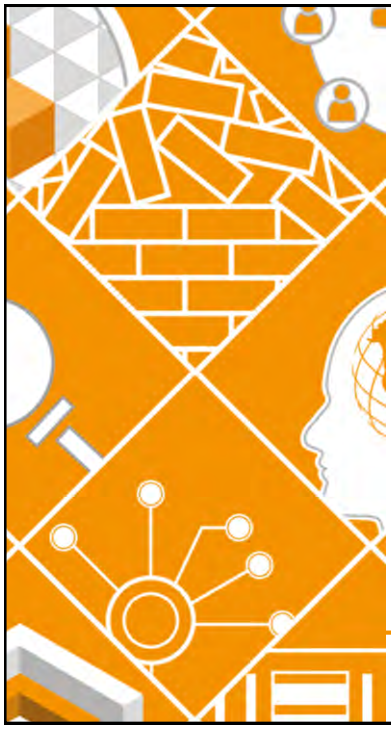

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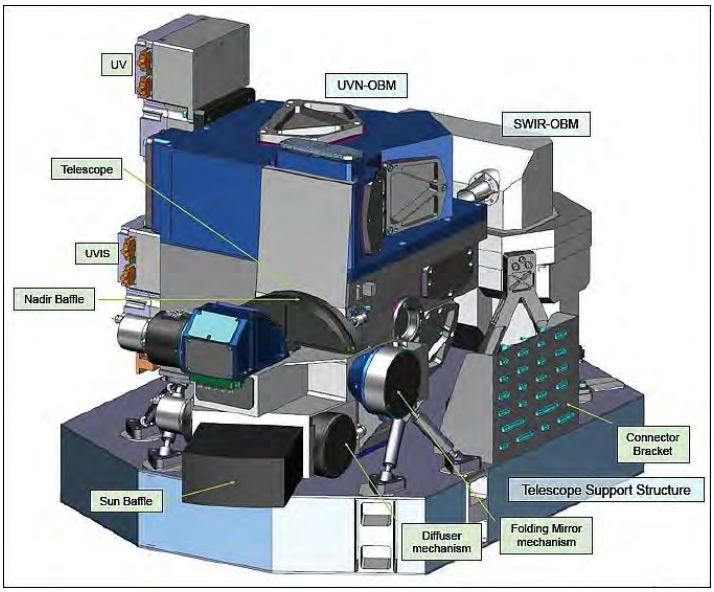
Can you help us?

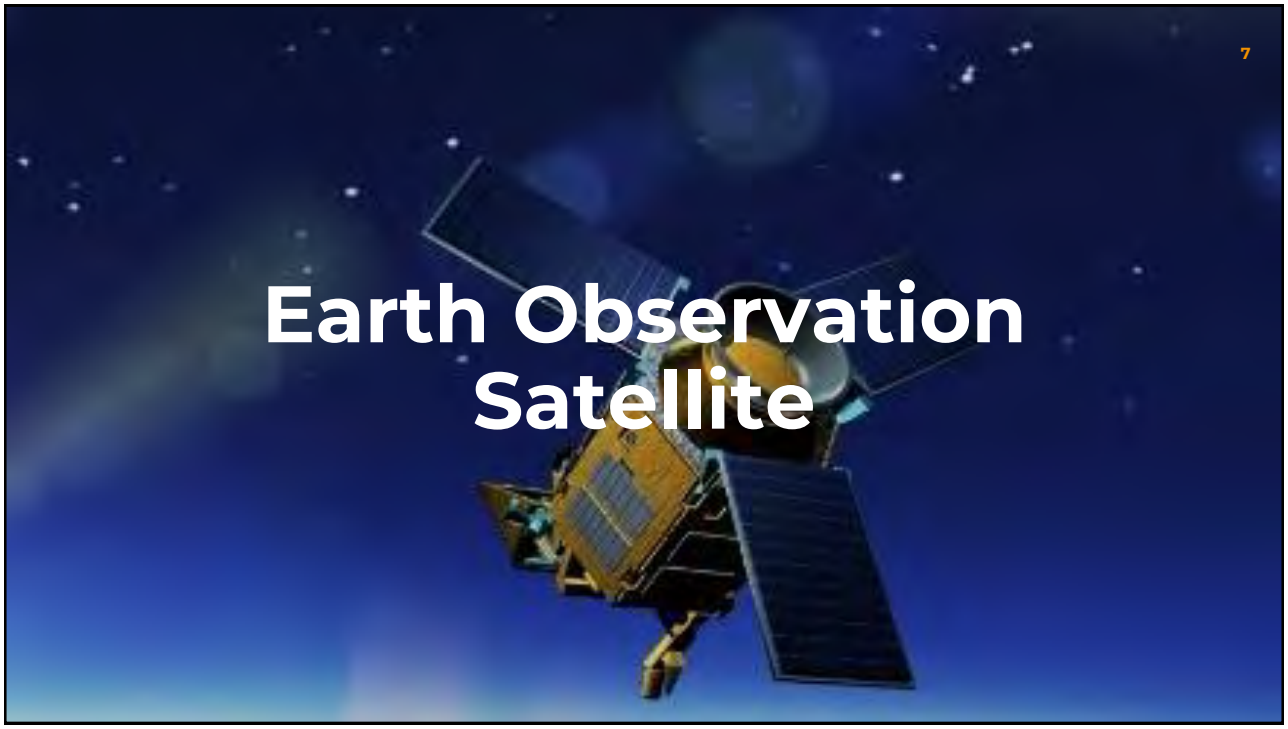
Time - Budget

- We will be late, and we don't want to be late
- We cannot afford to be late
- When the money is used, **there is no more.**



6

Earth Observation Instrument



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In Short

- Very experienced Systems Engineers
- Using quantified requirements routinely
- 6 year pure waterfall project (process 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
- "Sorry, we delivered 1 day early" (instead of expected 1 year late)
- **Savings: at least 40 man-year (about €6M ?)**
- **How did they do that ?**

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Issues

- Many interdependent deadlines
- Many unforeseen issues, resulting in significant changes
- Delay declared unacceptable by customer
  - Launch date fixed
  - Money fixed
- Team over-stressed, no clear focus on tasks at hand
- Everything is 80% complete – nothing 100%

Ref: Project Systems Engineer

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Convincing the Project Manager

How to convince the Project Manager

1

- We've been doing these kinds of projects for 27 years.
- We're very good at it.
- What do you think you can contribute to that?

2

- Do you have to deliver anything by the end of the week?
- A status report?
- How much time do you need?
- How much time do you have?
- Does it fit?

3

- What are we going to do about it?
- Please coach the team!

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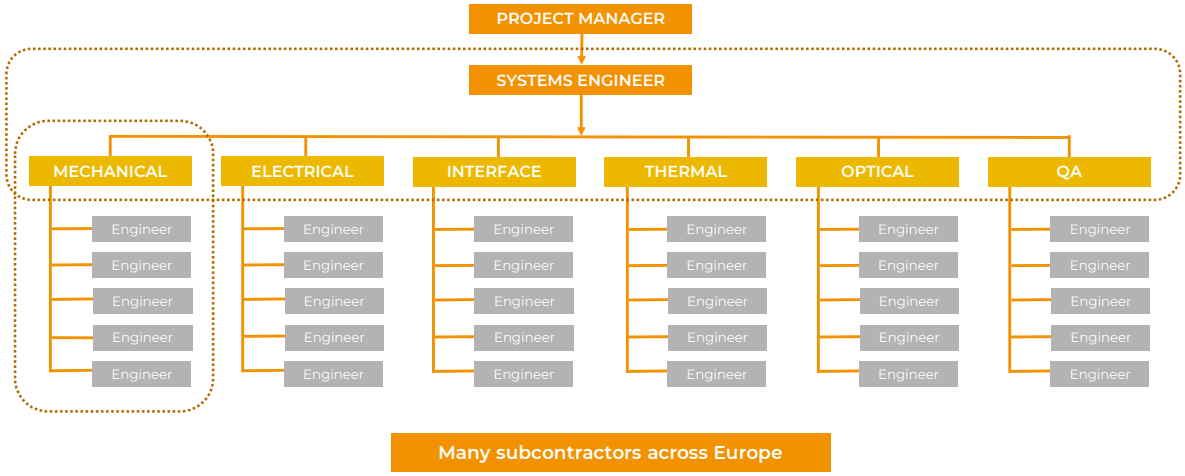
Systems Engineering

The Project



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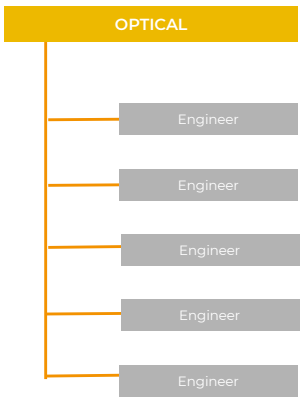
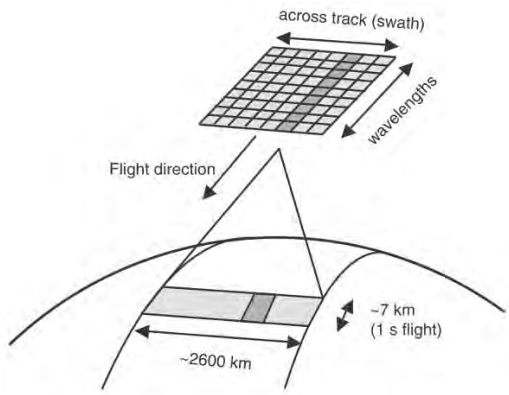
Systems Engineering

Scanning the Globe





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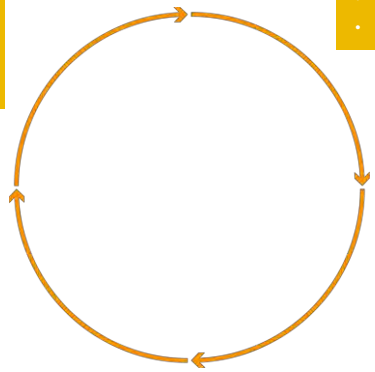
Evolutionary Project Management

Plan – Do – Check – Act | The Powerful Ingredient for Success

PLAN
- What to achieve
- How to achieve it

ACT
- What are we going to do differently?



CHECK
- Is the result according to plan?
- Is the way we achieved the result according to plan?

DO
Carry out the plan!

14

Evolutionary Project Management

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- What to achieve
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ACT
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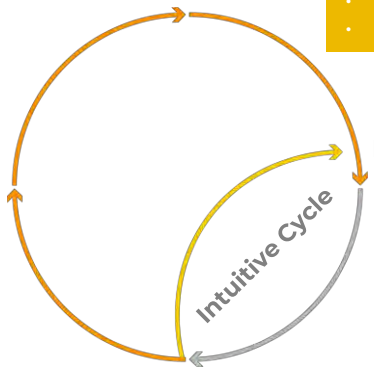


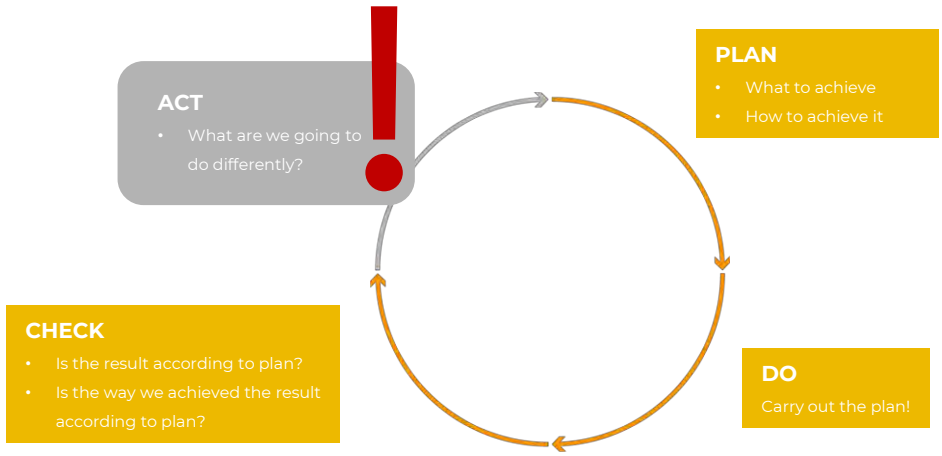
CHECK
- Is the result according to plan?
- Is the way we achieved the result according to plan?

DO
Do something

15

Evolutionary Project Management

Plan – Do – Check – Act | The Powerful Ingredient for Success



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Evolutionary Approach (Evo)

Plan – Do – Check – Act - *on every level*

- **Zero Defects**
  - Prevention costs less than repair
- **Business Case** — **Why?**
  - Why are we going to improve what?
- **Requirements Engineering** — **What? How much? Are we done?**
  - What are we going to improve?
  - How much will we improve? - Quantification
- **Architecture Design**
  - Selecting the optimum compromise for the conflicting requirements — **How?**
- **Early Review and Inspection**
  - Measuring quality while doing, learning to prevent doing the wrong things. — **Check as early as possible**

Right Result

- **Weekly Task Cycle**
  - Short-Term Planning
  - Optimising Estimation
  - Promising what we can achieve
  - Living up to our promises
- **Bi-Weekly Delivery Cycle**
  - Optimising requirements, checking assumptions
  - Soliciting feedback by delivering real results to eagerly waiting stakeholders
- **Timeline**
  - Getting and keeping control, predicting the future
  - Feeding program/portfolio/resource management

Efficiency of what we do

Effectiveness of what we do

What will happen
What will we do about it?

Right Time

EVO PROJECT PLANNING

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Quality on Time

=

Right Result + Right Time

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Evolutionary Approach (Evo)

Plan – Do – Check – Act - *on every level*

- **Zero Defects**
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- **Business Case**
  - Why are we going to improve what?
- **Requirements Engineering**
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- **Architecture Design**
  - Selecting the optimum compromise for the conflicting requirements
- **Early Review and Inspection**
  - Measuring quality while doing, learning to prevent doing the wrong things.

Right Result

Why?

What?
How much?
Are we done?

How?

Check as early as possible

- **Weekly Task Cycle**
  - Short-Term Planning
  - Optimising Estimation
  - Promising what we can achieve
  - Living up to our promises
- **Bi-Weekly Delivery Cycle**
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Right Time

Efficiency of what we do

Effectiveness of what we do

What will happen
What will we do about it?

EVO PROJECT PLANNING

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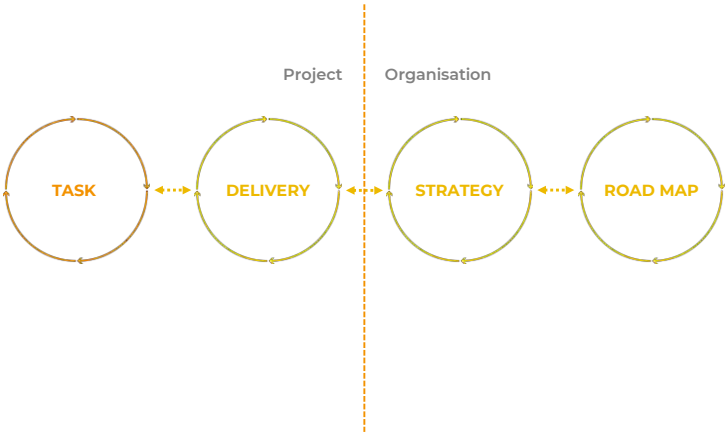
Weekly TaskCycle

What are we going to do, what not, and why



Removing Waste Before Time Spent

- Are we doing the right things?
  - In the right order
  - To the right level of detail for now
- Optimising 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 (default 2/3)
  - In the remaining time, do whatever else you have to do
- Tasks are always done, 100% done

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Weekly TaskCycle

What are we going to do, what not, and why

Task	Hrs
Task a	2
Task b	5
Task c	3
Task d	6
Task e	1
Task f	4
Task g	5
Task h	4
Task j	3
Task k	1

DO

26

DO NOT

Weekly Plan

- How much time do we have available
- 2/3 of available time is net plannable time
  - 2/3 is default start value. This value works well in development projects
- What is most important to do
- Estimate effort needed to do these things
- Which most important things fit the available time
  - Default 26 hours per week
- What can, and are we going to do
- What are we **not** going to do

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Weekly Planning

Optimising Time Spent on Planning

Individual Preparation

- Conclude current tasks
- What to do next
- Estimations
- How much time is available

Modulation with / coaching by ~~Project Managment~~ Systems Engineer/Team Lead

- Status
  - All tasks done, completely done, no need to think about it anymore?
- Priority Check
  - Are these really the most important things?
- Feasibility
  - Will it be done by the end of the week?
- Commitment and Decision

Synchronisation with group (team meeting)

- Synchronisation
- Formal Confirmation
  - This is what we plan to do
- Concurrency
  - Do we have to synchronize?
- Learning
- Helping
- Socialising

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Awful Schedule Pressure!

	Doc 1	Doc 2	Doc 3	Doc 4	Doc 5	Doc 6	Doc 7
John	x		x	x	x	x	
Samuel	x	x		x		x	x
Paul	x	x	x	x	x	x	x
Michael	x			x	x		
Marc			x	x		x	x

Per Doc		Hour
4 Heavy	15	60
3 Easy	2	6
Other Work	Total	66 33
	Total	99

Available	2x26	52

Problem - Solution

- Meeting with sub-contractors in three weeks
- 2 weeks to review documents
- “Impossible deadline”
- How many documents to review?
- How much time per document?
- Some suggestions…
- Result: well reviewed, great meeting, everyone is satisfied

Time Line

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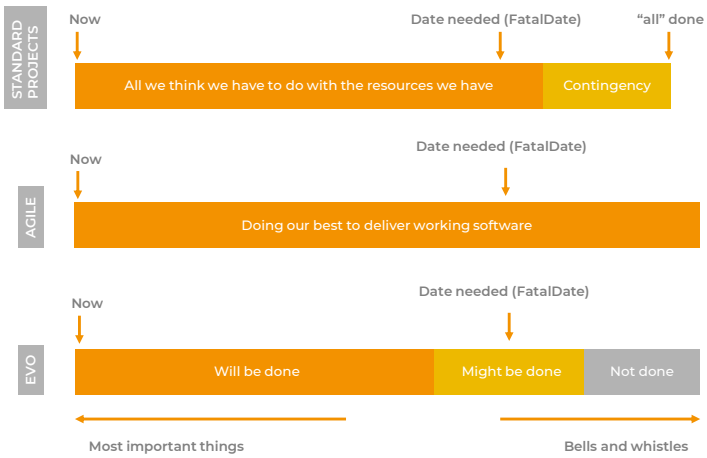

TimeLine

- How do we know that we do and get what is needed, when it's needed?
- Better 80% 100% done, than 100% 80% done.
- Let it be the most important 80%

Starting Deadlines

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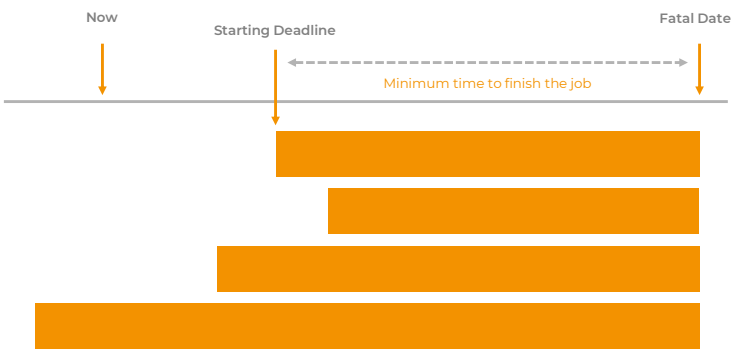
Even more important...



Starting Deadline

- Last day to start to make the finish deadline
- Everyday we start later, we will end later

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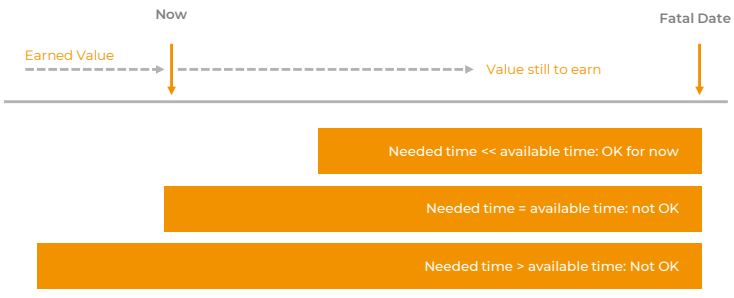
Failure is Not an Option

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



Most projects are late - what can we do about it?

- Value Still to Earn **vs.** Time Still Available.
- If the match is over, we cannot score a goal!

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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 Fatal Date is really felt

INTUITION OFTEN GUIDES US IN THE WRONG DIRECTION

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Adding People

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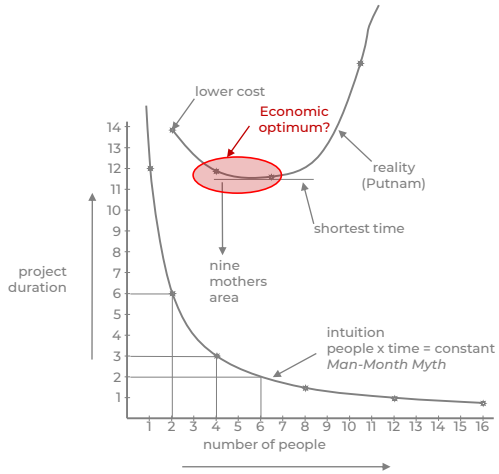

Brooks' Law (1975)

Adding people to a late project makes it later!

Saving Time

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We can save time <u>without negatively affecting the result!</u>

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 the 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 to do things better and overcoming bad tendencies

Efficiency in when we do it

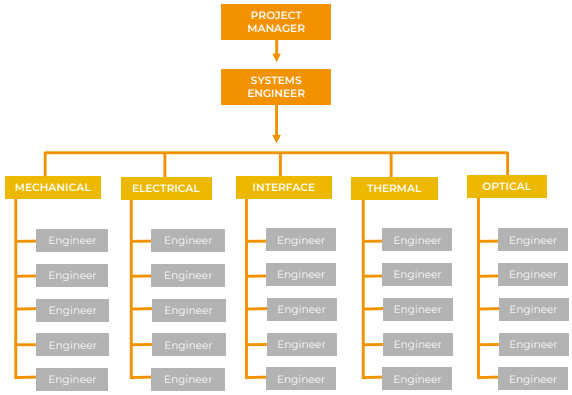
- At the right time
- In the right order

Time Boxing

- Much more efficient than Feature Boxing!

CONTINUOUS ELIMINATION OF WASTE

Did it work for this project?



Did it work?

- 2 months needed to get the process in full swing
- All engineering documents in PDF, and CDR data packages on time
- Stress level in team greatly reduced
- More supervisory work for Systems Engineer
  - Can effectively handle up to 8 people
- People not in the Evo swing lag behind so we need everyone to follow.
- Good enough to become company standard? I say YES!

Ref: Project Systems Engineer

Launch

Why did it take so long before actual launch?

- The launch delay was caused by issues you cannot predict, even with Evo
  - The launch SW from the Ukraine, bought by ESA 5 years ago was to be used in Russia Incomprehensibly, that was a bit more difficult than it was 5 years earlier
  - By now, the problem seems to have been solved and the launch is planned March, … April, …
  - (New Deadline: August… Finally launched 13th October 2017)
- Incidentally, I just today introduced Evo to a new team member of our current project
  - Mapping the large-scale structure of the universe over a cosmic time covering the last 10 billion years
- I'm curious to find out how quickly she'll really get the idea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Quality on Time
Delivered by Niels Malotaux
14 - 15 June 2021 | on-line
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