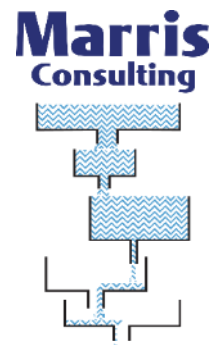




Critical Chain Project Management

Webinar



Paris, Tuesday 5th of December 2023
Version 1.0



Agenda

- Introduction
- Why you should already have implemented Critical Chain Project Management
- Critical Chain planning principles
- Project execution the Critical Chain way
- Example: New Product Development at Circor Aerospace
- Conclusion

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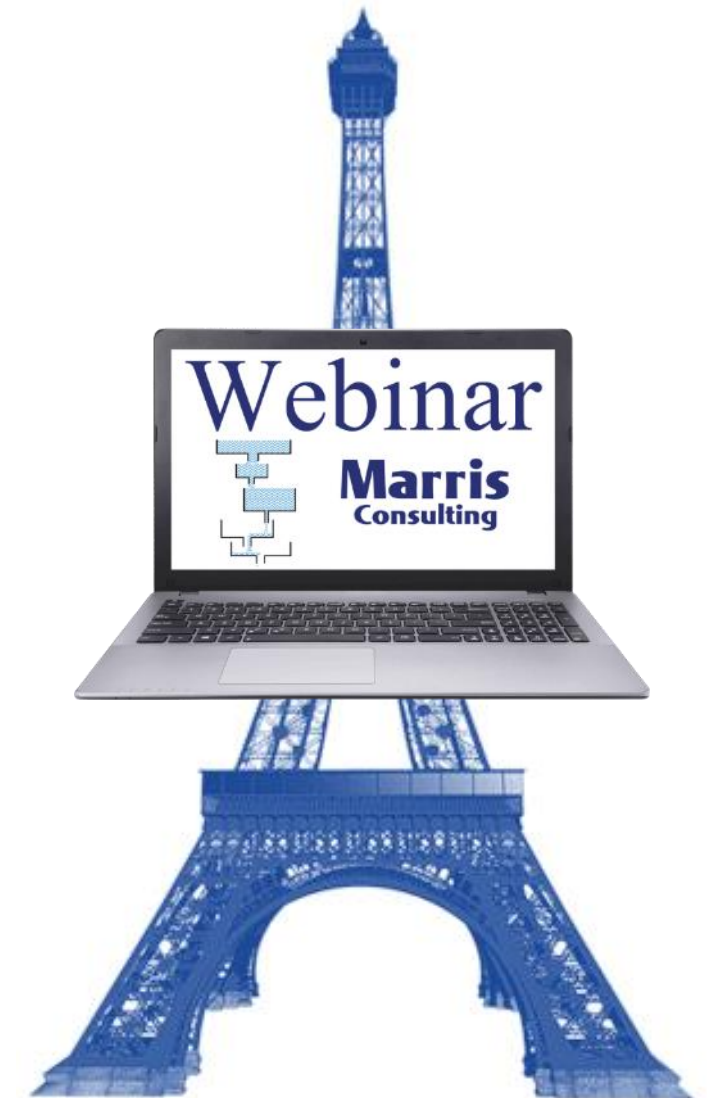
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Philip Marris

Organization of the webinar

- Presentation : 40 minutes.
- Followed by a Questions & Answers session of 20 minutes.
- You can ask questions and make written comments throughout the webinar using the "Q. and A." feature.
- The slides will be available on our website at the end of this webinar.
- There will be surveys during the webinar.
- The webinar is managed by 2 people:
 - **Philip Marris the "speaker"**.
 - **And a webinar manager whose role is:**
 - To read the written questions as the webinar progresses.
 - To manage the questions and answers session (choice of questions, etc.).



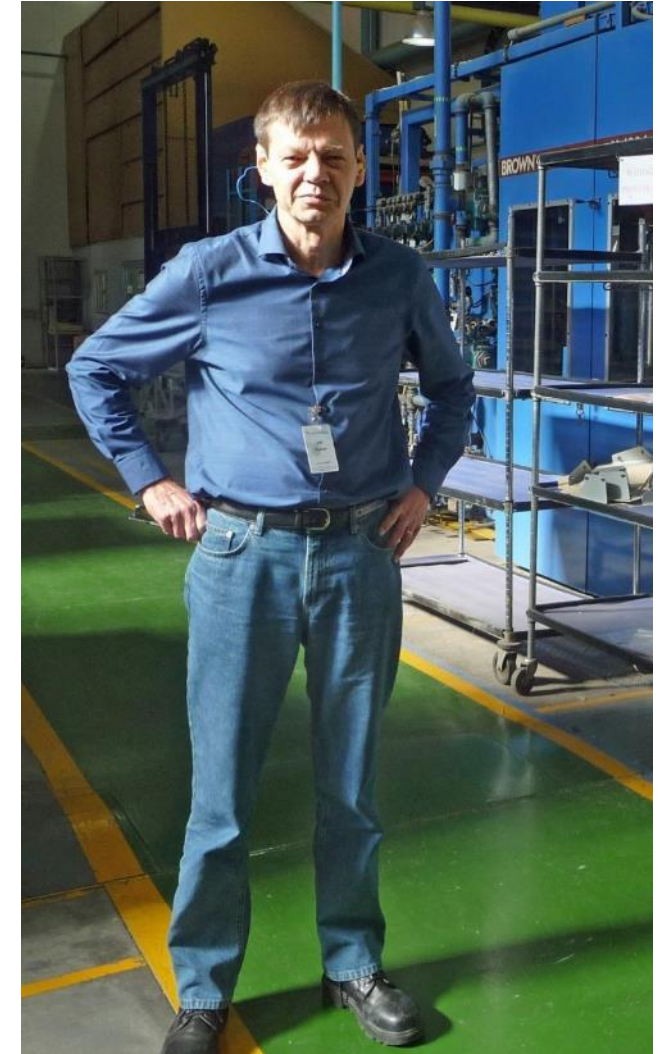
Philip Marris: CEO, Marris Consulting

- English...and European,
- Bilingual & bicultural English/French.
- Consultant (sorry).
- Started using Lean in industry in 1984.
- Has been implementing ToC since 1986, when he worked with Eli Goldratt, the founder of Theory of Constraints/ToC.
- Implementation of ToC and Lean in more than 300 companies around the world.
- Author of the French reference book on ToC in production: *Le Management Par les Contraintes*.
- Founder in 2005 of Marris Consulting.



Marris Consulting, a consulting firm specialized in operational excellence and project management

- Founded in 2005 by Philip Marris and based in Paris.
- 15 consultants and its network of partners.
- Over 70 Critical Chain Project Management implementations.
- Over 400 videos of customer testimonials, educational presentations, expert interviews, etc.
- Discover our new Critical Chain Project Management **online training**, launched in 2023.



We are honored to have been able to help...



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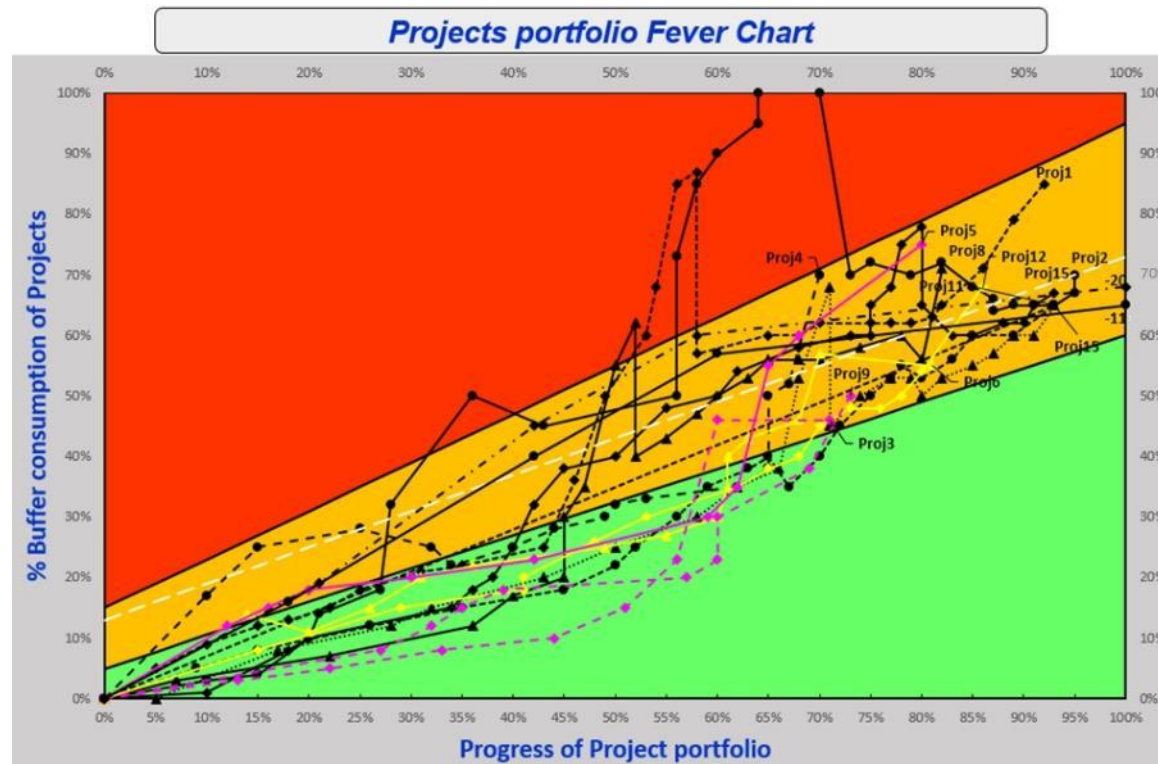
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Why you should already have implemented Critical Chain Project Management #1/4

- The results are literally extraordinary:
 - To finish nearly all your projects on time (and within budget and full specifications).
 - And simultaneously to do your projects twice as fast as before.
 - And at the same time doing twice as many projects per year with the same resources.



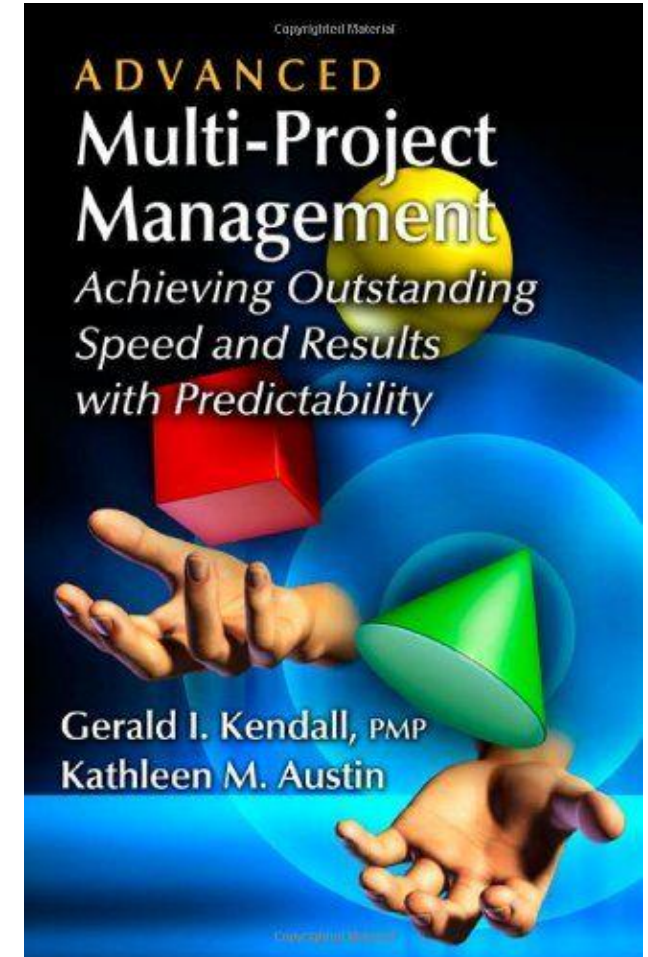
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Why you should already have implemented Critical Chain Project Management #2/4

■ The results are literally extraordinary:

- To finish nearly all your projects on time (and within budget and full specifications).
- And simultaneously to do your projects twice as fast as before.
- And at the same time doing twice as many projects per year with the same resources.

Results	Average	Worst case	Best case
Project durations	- 39%	- 13%	- 78 %
Number of projects completed in a given time	+ 70 %	+ 15%	+ 222%
Throughput	+ 53%	+ 14%	+ 150%



Source: “Advanced Multi-Project Management Achieving Outstanding Speed and Results with Predictability” 2013 book by Gerald I. Kendall & Kathleen M. Austin, page 95. The analysis is based on public information available concerning 60 different organizations working in different industries that had applied CCPM.

Why you should already have implemented Critical Chain Project Management #3/4

- The PMI 2019 Best Project Of The Year was awarded to Embraer for developing a new airplane using Critical Chain and breaking many industry performance records.

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Best project of the Year 2019 Award

← EMBRAER

E-Jets E190-E2

Project Management Institute.

PMI
Project Management Institute®

Using **Critical Chain** Project Management approach

E190-E2 BUFFER CONSUMPTION

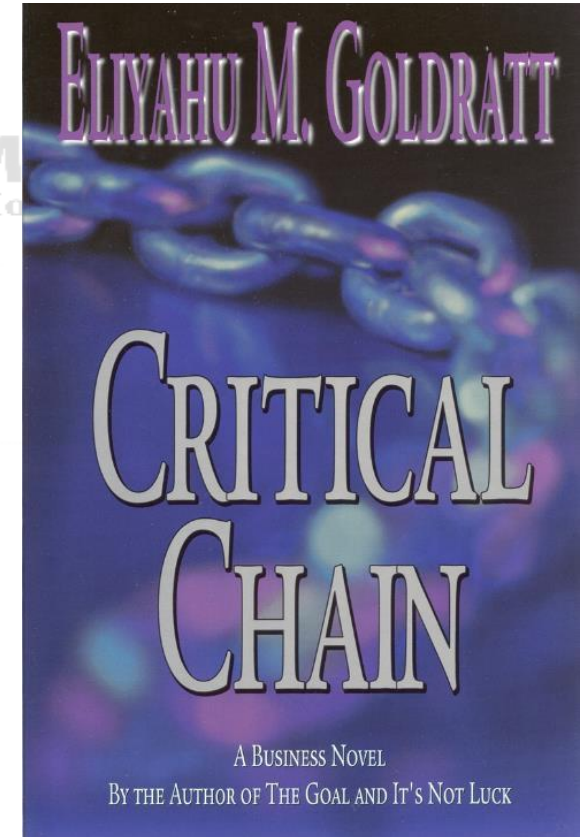
Schedule reduction was of 22.5 months

* Project Management Institute, international association of 1,000,000 members

Why you should already have implemented Critical Chain Project Management #4/4

- The number of implementations worldwide:
 - Over 3,000?
© Marris Consulting
 - Failures are rare.
 - The results are long lasting.
- Because it's easy.
 - This webinar aims only to give you an "Executive summary" and to seduce you, but to understand 80% of CCPM it takes less than a day.
- Because it contributes significantly to a better working environment.

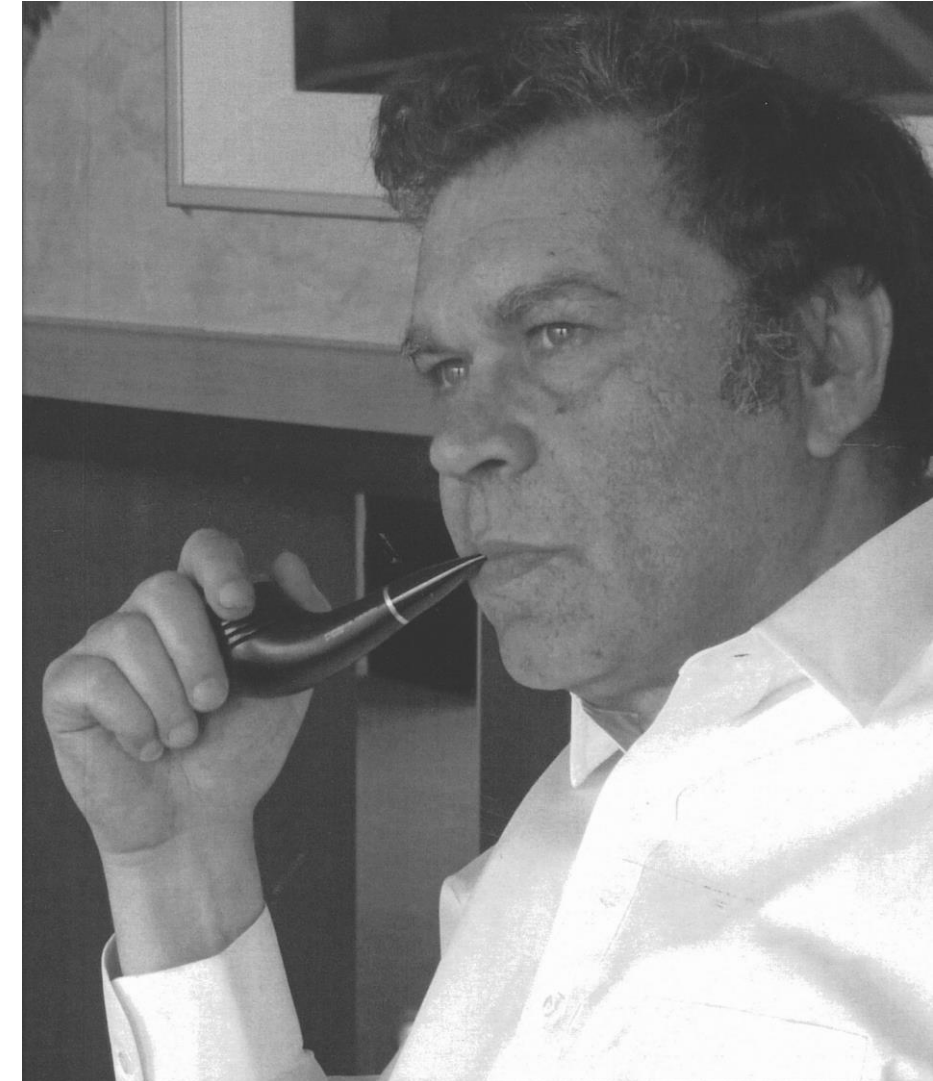
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Either your projects fail, or you use Critical Chain

The hidden side of the Theory of Constraints*

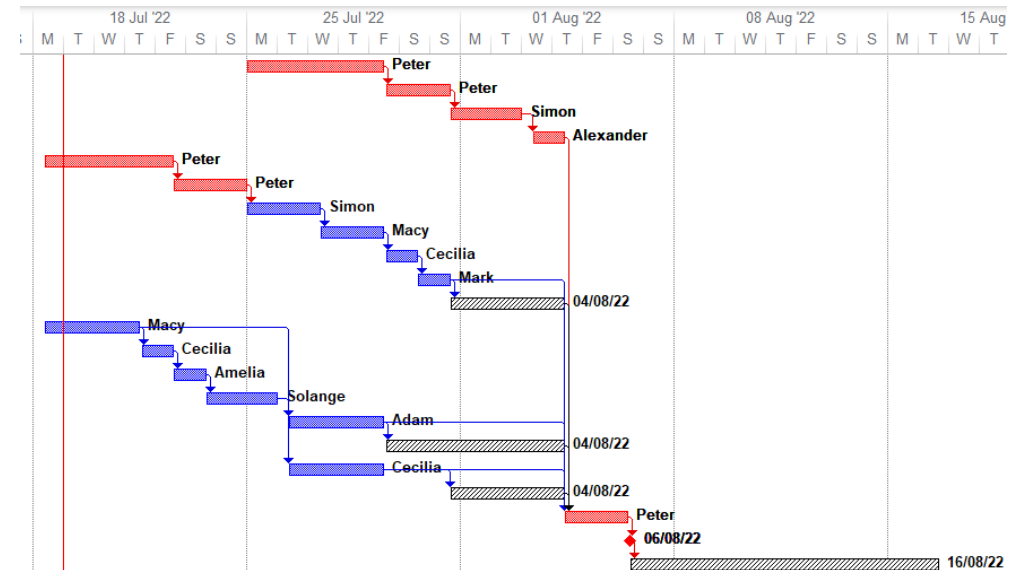
- The Theory of Constraints is often considered to be only dealing with capacity constraints and flow management.
© Marris Consulting
- But another facet of ToC is just as important: its explicit **management of variability and uncertainty** whatever the cause.
 - Machine breakdowns, quality problems, unforeseen fluctuations in demand, **uncertainties about task durations**, etc.
- And it is this facet that the Critical Chain approach exploits.
- Because project environments are very unpredictable.
 - The duration of a design task, the number of iteration loops during product development, the characteristics of a product that does not yet exist, etc.
- The duration of a task cannot be described with a single number. At least 2 are needed: the average and the standard deviation.



* See the replay of our webinar about Theory Of Constraints available on our Marris Consulting YouTube Channel

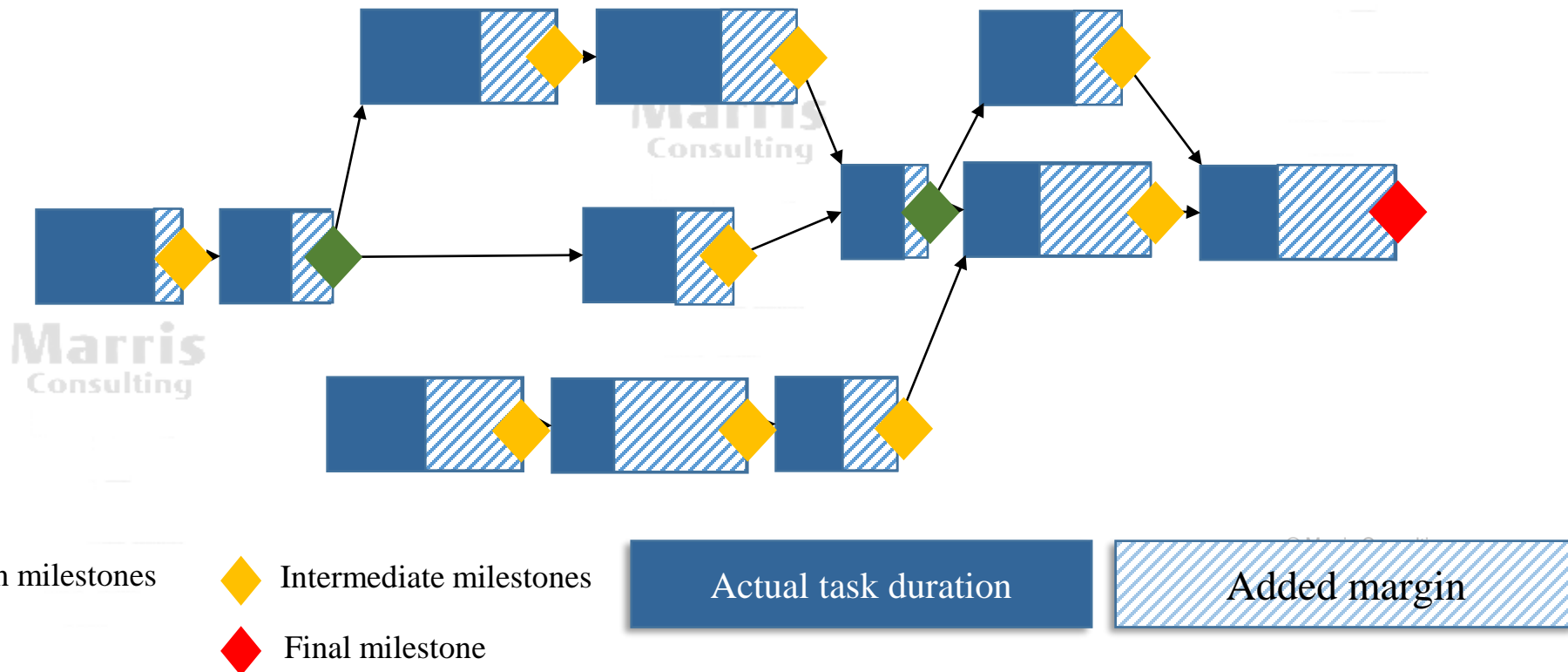
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Project managers try to compensate for the uncertainties inherent in their projects

- Management asks for commitments on dates of task completions
- Local margins are added to each task duration
- Failures encourage micro-management and more and more detailed schedules



Critical Chain aims to protect the project as a whole, not the individual tasks

- All project tasks have significant security margins, but they are wasted.
- In Critical Chain, these margins are reduced and mutualized in a buffer at the end of the project.

With traditional planning...



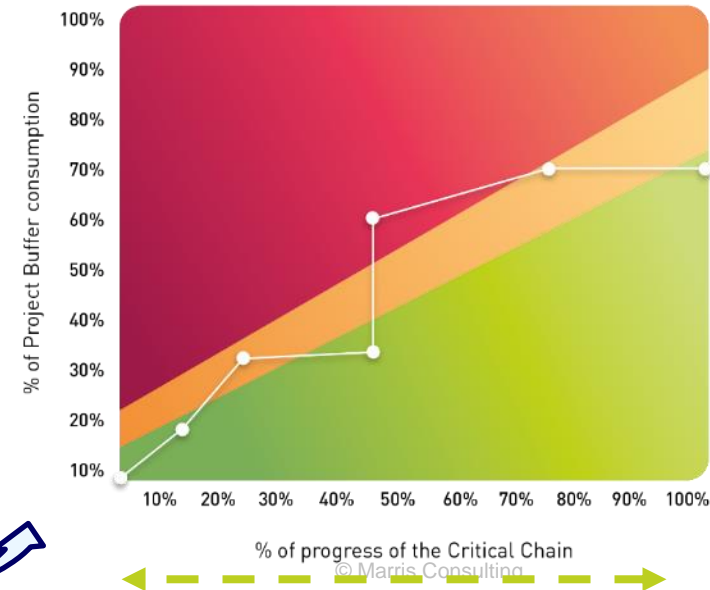
... each task has its own margin



With Critical Chain, margins are mutualized in a buffer at the end of the project



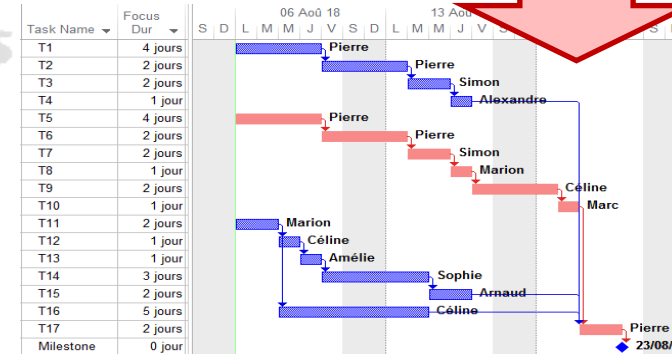
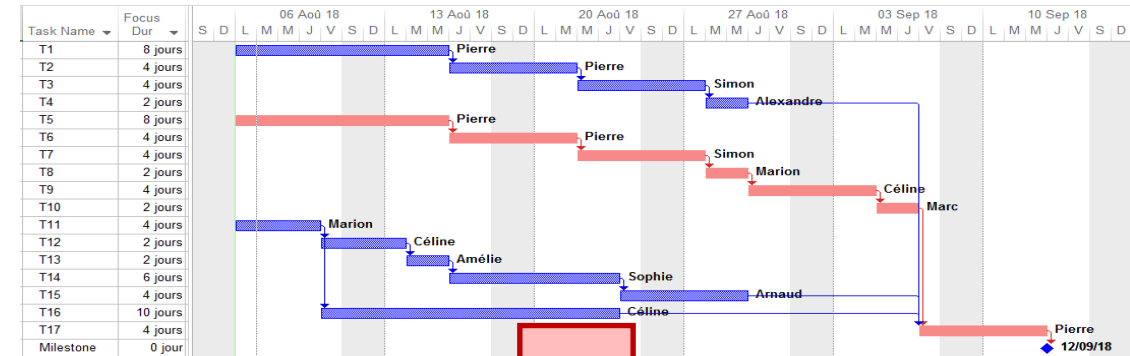
Fever Chart



With Critical Chain planning, the planned duration of tasks is reduced by 50% on average (!)

- **The "focused" duration** is the working time required on average to complete the activity:
 - In perfect working conditions,
 - No other concurrent work (no multitasking),
 - With all the necessary information available (full-kit),
 - Without interruptions.
- There is no added safety margins.
- The focused duration is not a commitment. There is a 50% probability of exceeding it.

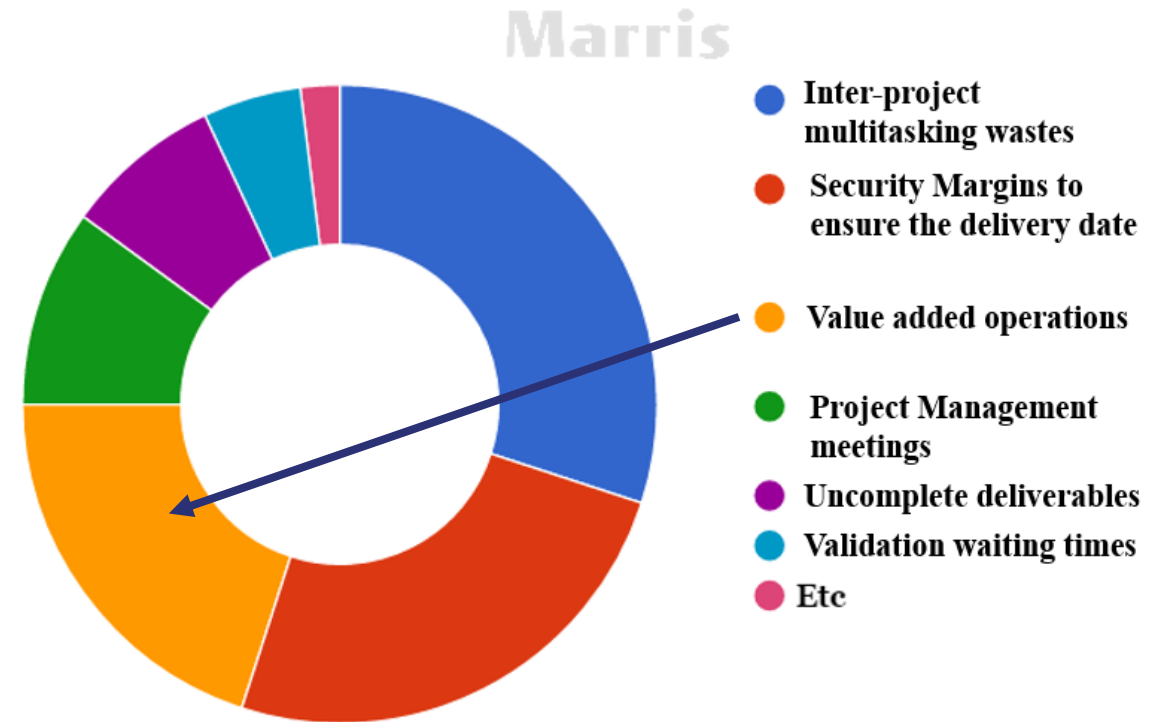
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Getting everyone to accept very short focused durations is easy!

- To reduce the duration of tasks by about 2:
 - We formally advise against the approach that is too often recommended: a top-down decision.
 - **We recommend to trust the seductive capacity of the Critical Chain: train all those who must predict the durations (one day of training) then ask them to re-estimate their "focused" durations.**
- We find that durations can be reduced by more than 50% on average.
- Note that some tasks will go from 2 weeks to 1 day, others will be incompressible (e.g. stability test of a drug or traditional sub-contracting).



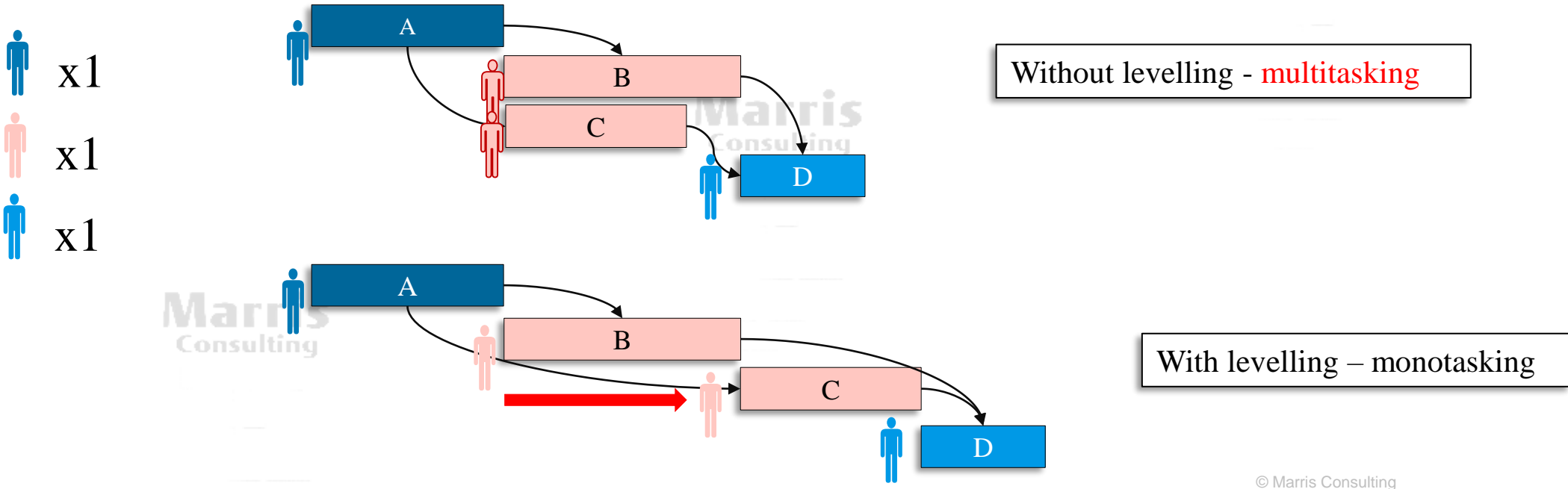
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Online course extract:

The capacity of the resources is rarely taken into account



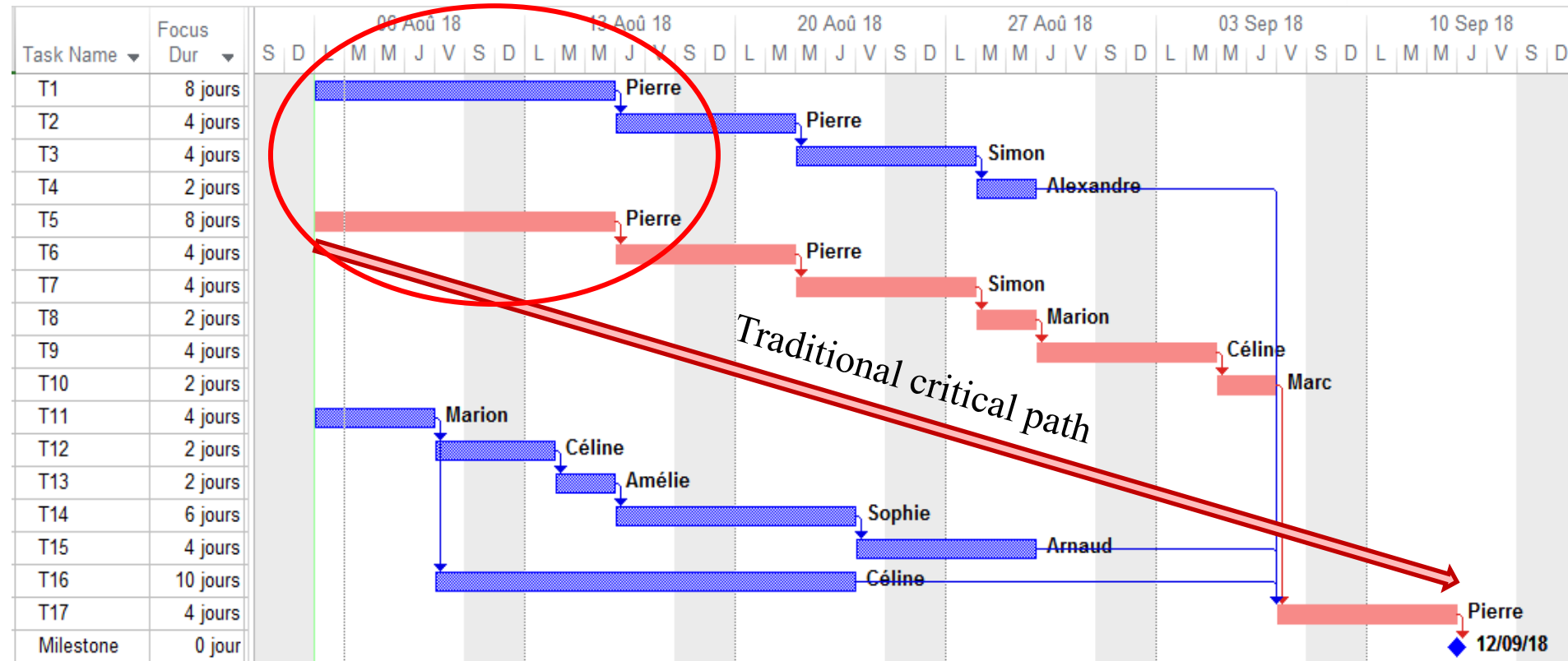
- Levelling (*technique to adjust start and finish dates taking into account resource contentions in order to balance the demand for resources and their availability**) exists in almost every project management software.
- It is rarely used, because resources are not described in schedules, but also because levelling extends the project scheduled duration:



* Source: PMBOK Project Management Body Of Knowledge / Project Management Institute (PMI)

Unlike traditional approaches (such as Critical Path), planning takes into account the capacity and availability of resources (finite capacity)

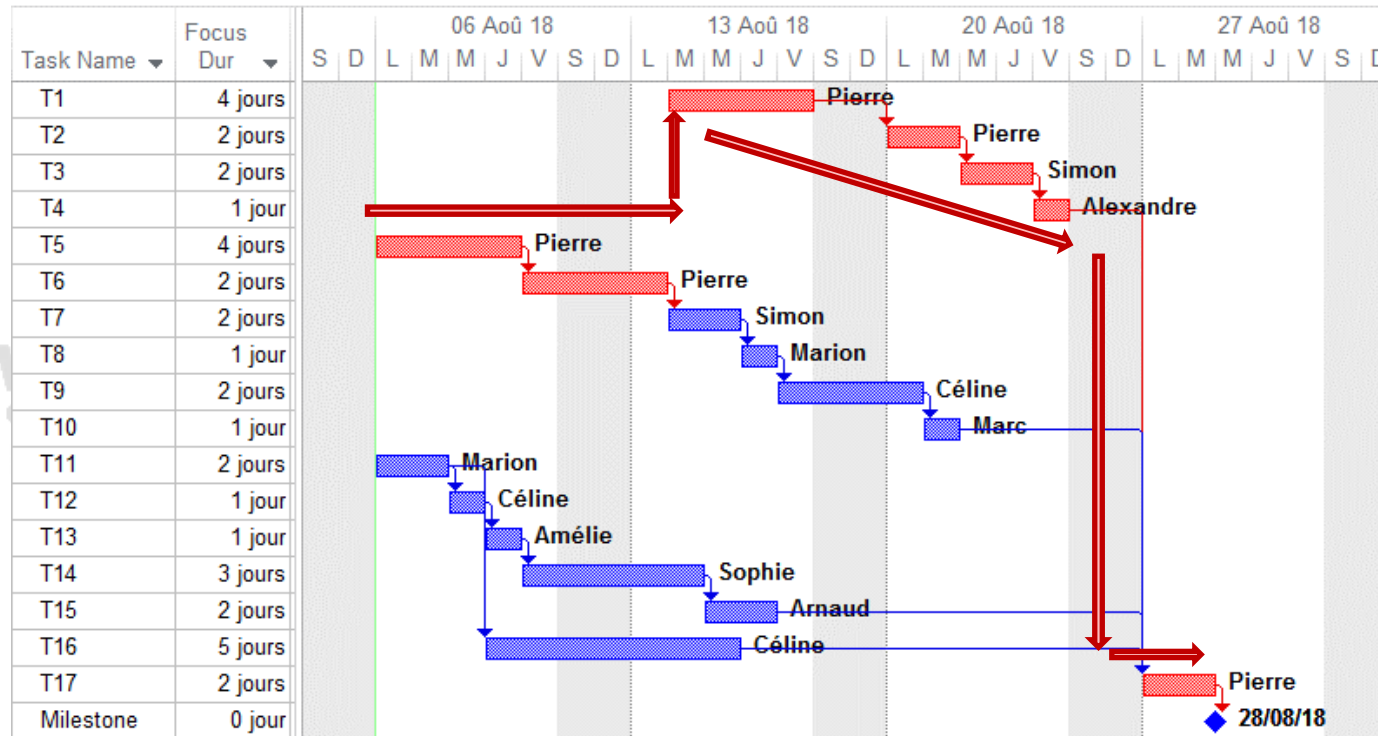
- Resources are rarely taken into account in traditional planning, so:
 - The same resource can have several tasks scheduled at the same time (no leveling).
 - The “Critical Path” (the traditional approach) ignores resource constraints.



The Critical Chain is a kind of “leveled Critical Path”

■ **The Critical Chain is the longest path of a project, taking into account logical links and resource dependencies.**

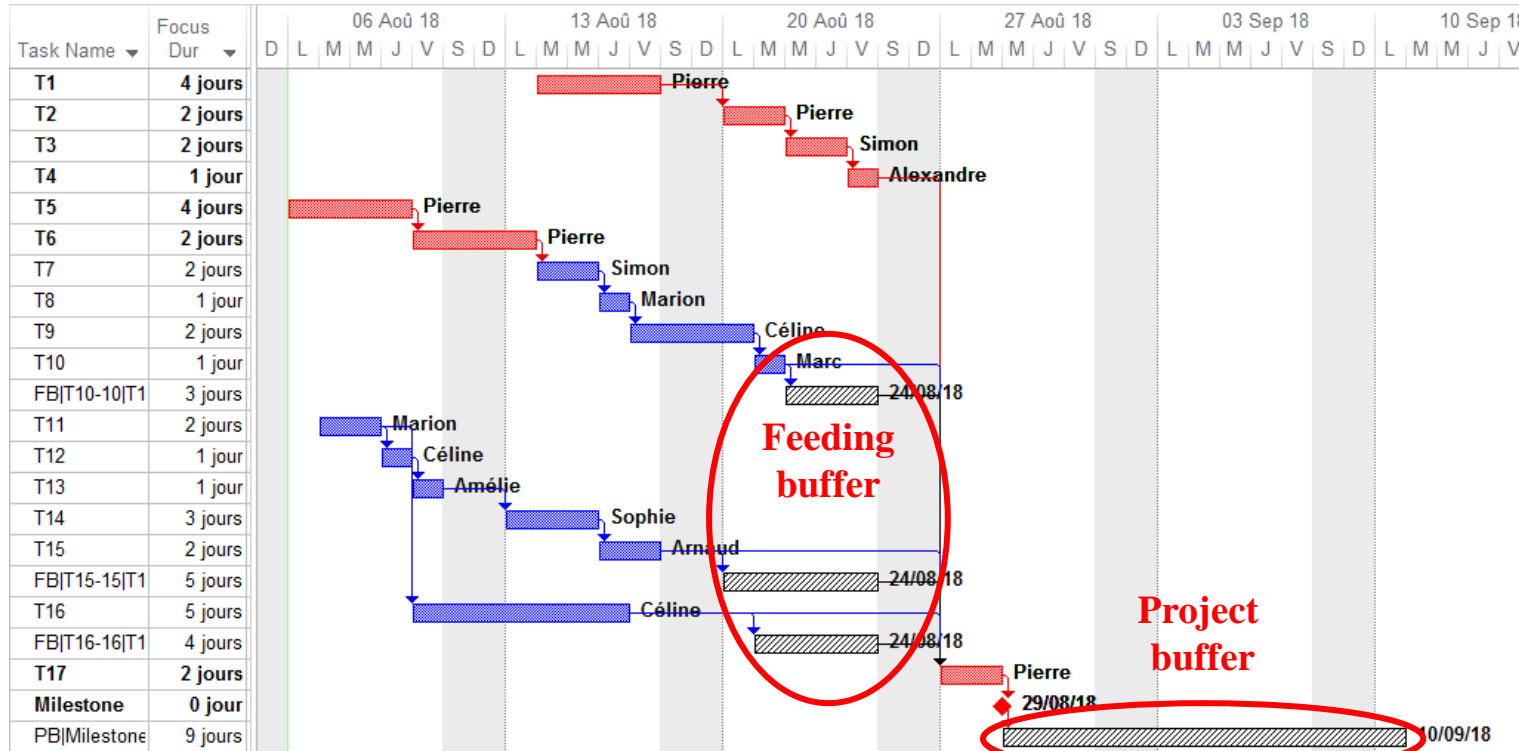
- It is achieved by leveling tasks so as not to schedule multitasking.
- The duration of the project is determined by its constraint: the Critical Chain.



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The total duration of the project is equal to the Critical Chain plus a “Project buffer”

- The project buffer pools the safety margins of critical tasks; it represents about a third of the total project duration.
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- The Critical Chain is protected from non-critical tasks by “Feeding buffers”.



The addition of Feeding Buffers ensures that the Critical Chain will not change during execution (unless there is a very major disruption)

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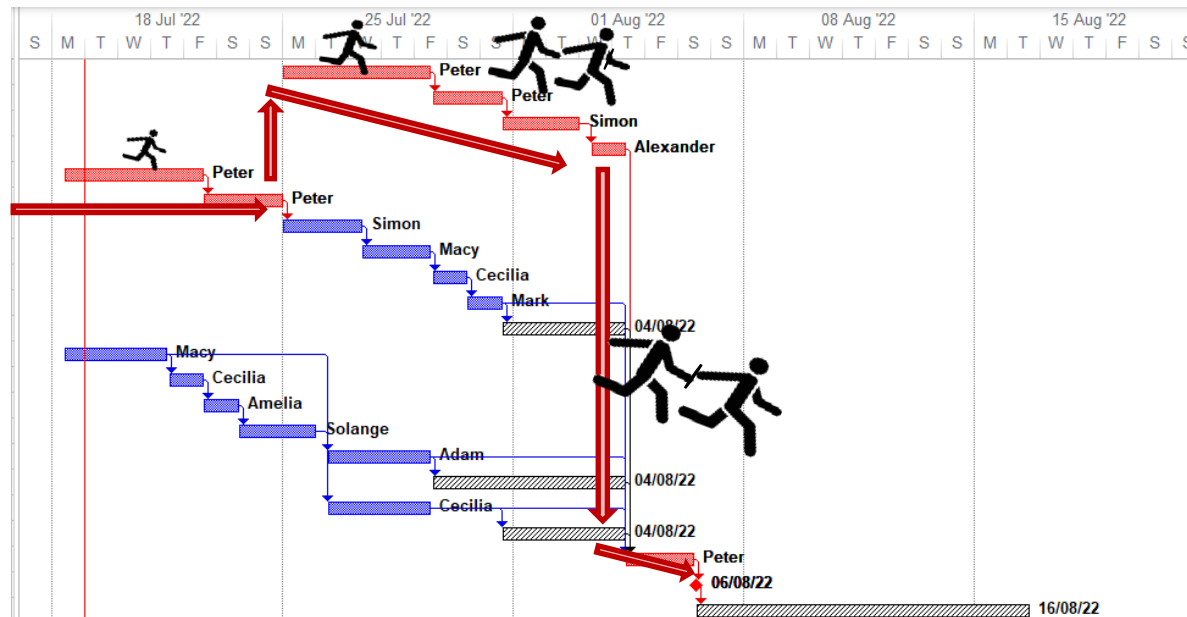
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During project execution, we focus on the smooth execution of tasks on the Critical Chain

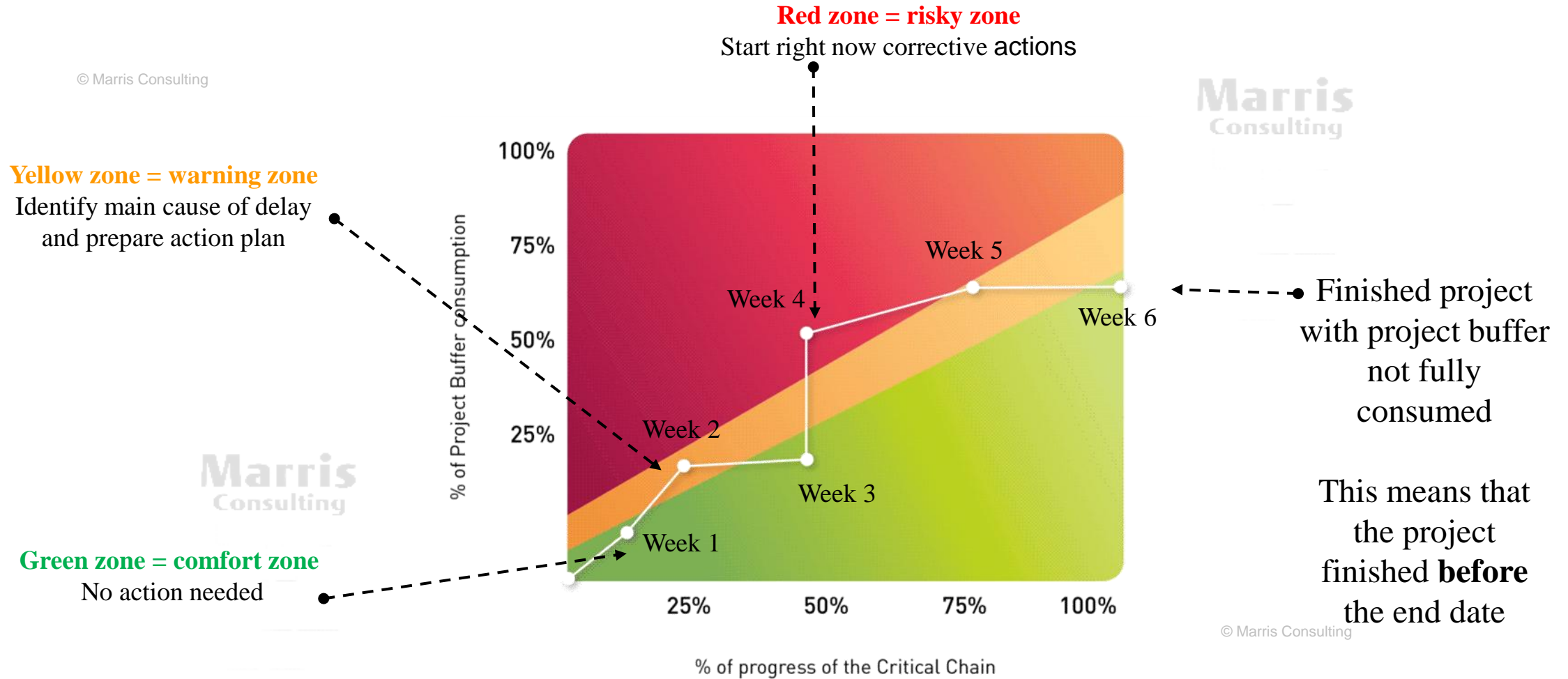
- The project is carried out according to the principle of the **relay race** throughout the Critical Chain.
- Having a mascot (a noticeable object) enables one to follow physically the successive offices and workstations the Critical Chain passes through.

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*By asking less than 1% of the resources to run,
it's in fact the whole company that goes faster*

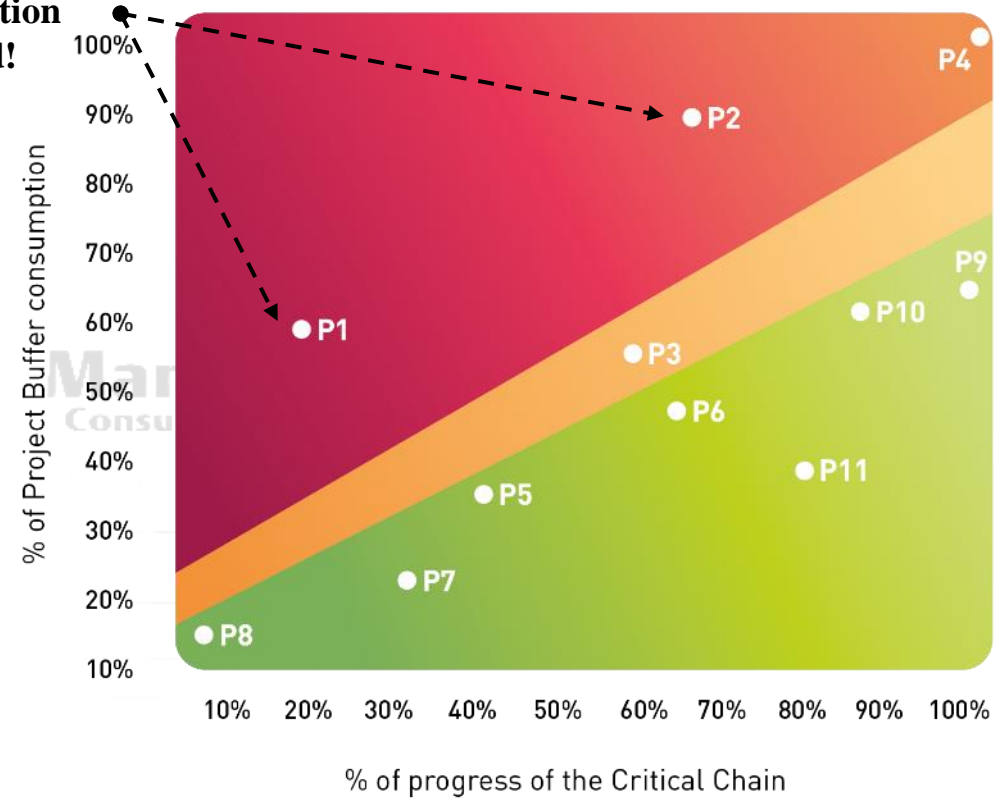
Project monitoring is easy thanks to the **Project Fever Chart**



Managing a project portfolio the Critical Chain way is easy

- If each project in the portfolio is well planned taking into account the uncertainties, available resources, and practicing the “relay race” on the critical chain - if each project has a good chance of finishing on time - then managing a portfolio of healthy projects is relatively easy!
- It is sufficient to have a good system for identifying the priorities allowing all the actors to know what they have to do at any time by referring to a shared and objective system.

Projects 1 & 2:
urgent action needed!



Project 4:
Finished exactly on time

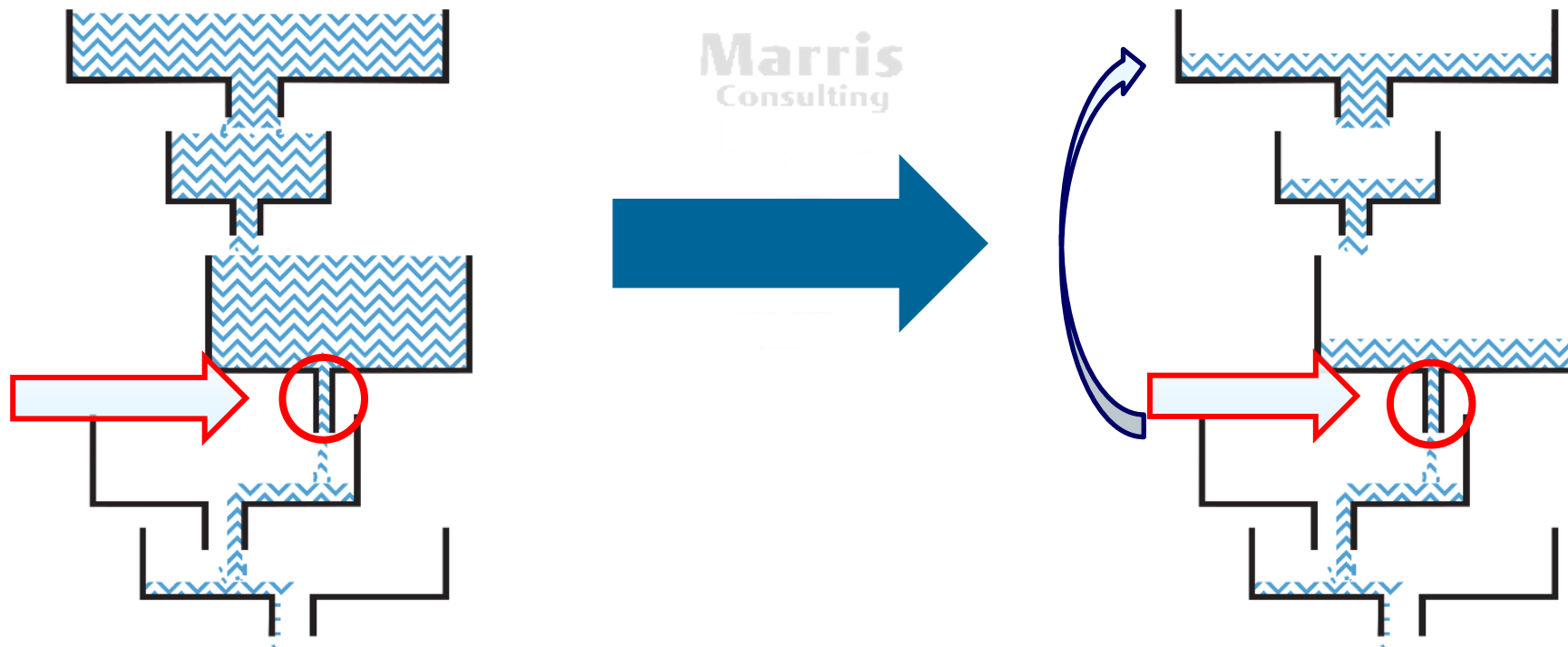
Projects 6 to 11:
(green zone)
nothing to report

Project 9:
Finished before the end date

The Portfolio Fever Chart helps to quickly track all the projects in the portfolio with objectivity and transparency

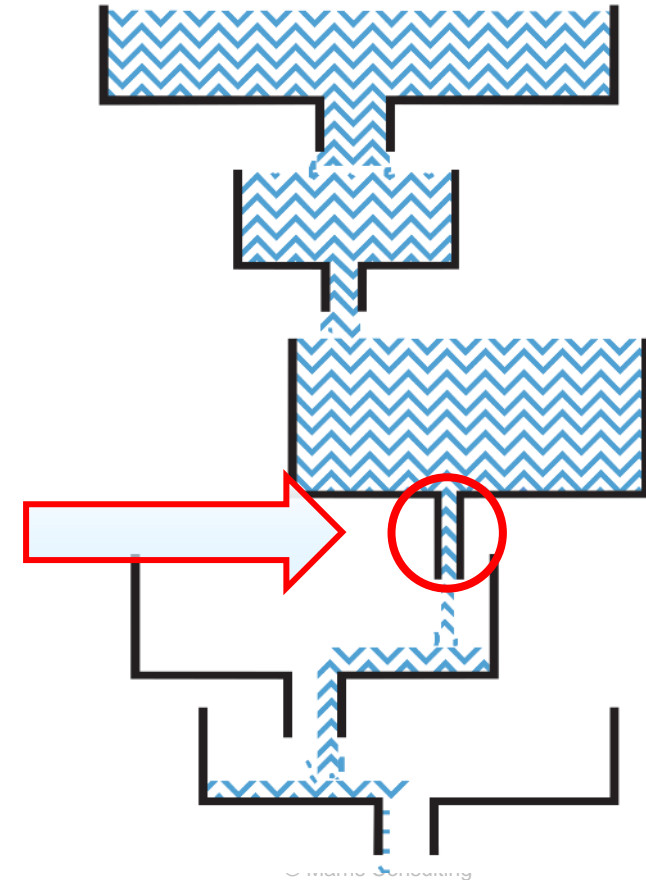
To limit the number of ongoing projects, do not launch projects too early

- Traditionally, people try to level resources between all projects.
- With the Critical Chain approach, we only consider the capacity constraint.
- Projects are launched according to the constraint's availability.
- Thus, we avoid unnecessary WIP that generates (very) bad multitasking.



Focus on the capacity constraint (the bottleneck) of the portfolio

- In project environments, there are 2 types of constraints:
 - The constraint of a project is its Critical Chain.
 - The constraint of a project portfolio is a resource (or group of resources).
We often see that it is:
 - From one of the business services,
 - Or one or two people with critical and unique skills,
 - Or the testing phases*.
- Theory of Constraints: the performance of the organization is determined by the performance of its (capacity) constraint.
- Just focusing on the bottleneck usually allows an increase of 20% to 100% of the overall performance (throughput or projects finished per year)



** See the replay our previous webinar about identifying the constraint
Available on our Marris Consulting YouTube Channel*

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Management de Projet par la
Chaîne Critique - Aéronautique



Témoignage client
Circor

For this webinar we chose a recent client assignment: Circor Aerospace

- Marris Consulting has implemented CCPM over 70 times over the past 15 years.
- You can see many of our clients' testimonials on our YouTube channel



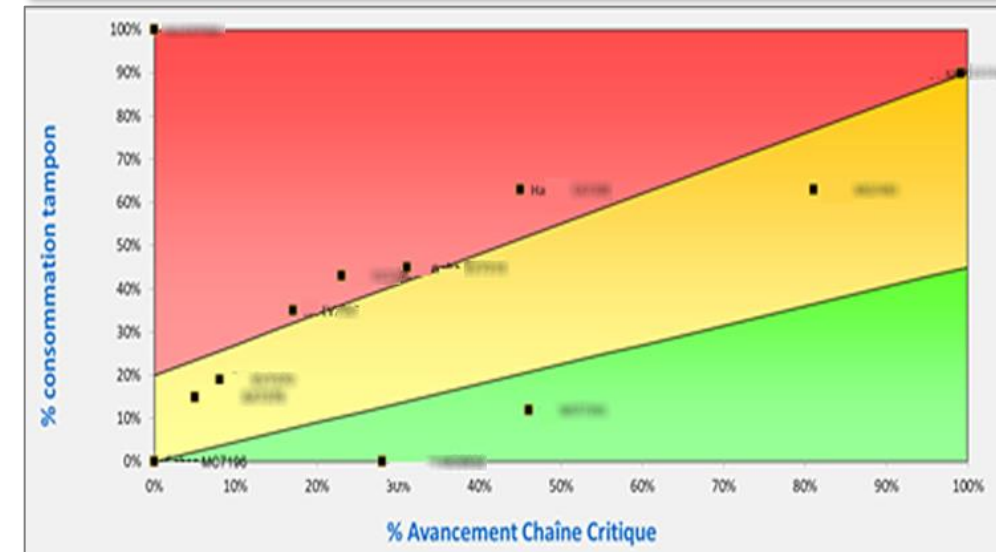
Circor Aerospace was suffering from poor performance in its new product development

- Circor International >3,000 people. Circor Industria >100 people.
- The main facility is based in France in Le Plessis-Tréville.
- Their products are found on most commercial and military aircraft, as well as on unmanned aircraft, military ground vehicles, shipboard applications and spacecraft.
- Core product lines: solenoid valves, pressure valves, motor-operated valves & manifold blocs for flight control systems & brake systems.
- They suffered from very poor OTD (On Time Delivery) project performance. The project durations were too long. There was a significant capacity bottleneck in the qualifications laboratory.
- Marris Consulting did a 2-Day Diagnostic and then an implementation assistance over 18 months.



Circor: a New Product Development and Industrialization project portfolio

- Initial implementation of the Critical Chain approach on 3 pilot projects.
- Panda mascots for each project.
 - © Marris Consulting
- Identification of opportunities to accelerate projects: sourcing using draft plans, involvement of stakeholders as early as possible in the project, internalization of prototyping, etc.
- Laboratory debottlenecking: 5S, checklists, earlier involvement in development projects, extra shifts for long cycle endurance testing etc.
- Used ProChain Microsoft Project add-on as a CCPM software.
- Decision-making based on the Fever Chart: prioritization of projects, allocation of additional resources, etc.
- Then, one year later, deployment across the entire project portfolio:
 - Creation of a standard schedule.
 - Analysis of the causes of buffer consumption.





Results: after 18 months projects finished twice as fast & on time delivery went from zero to 100%

Results:

- Reduction of project durations from 3-4 years to 18 months for full / complex product development.
- The qualification phase initially planned for 4-5 months has been reduced to 2 months.
- In-house prototyping enabled a 2-month acceleration on the Critical Chain.
- All project deadlines are honored, and all project milestones finished on or before scheduled dates.
- Enhanced visibility of project progress and their criticality, prioritization of projects using the portfolio Fever Chart.



Testimonials in French with English subtitles

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ONLINE COURSE



WILL YOU DARE TO FINISH ALL YOUR PROJECTS ON TIME?

A man in a blue shirt is visible in the bottom left corner of the slide.

Marris Consulting has launched several online training courses

Marris Consulting's Online Training Courses

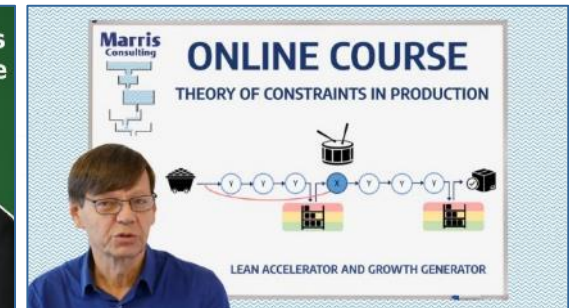
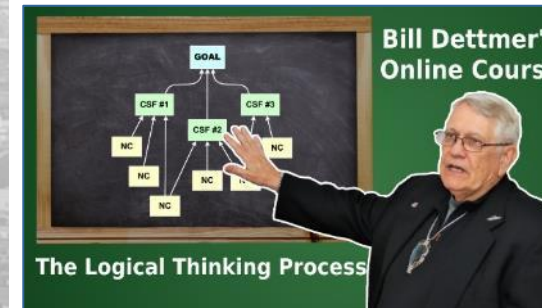
Welcome to our e-learning platform!

Here you can learn more about our online training offers:

Theory Of Constraints, Lean Management, Critical Chain Project Management.

Marris Consulting is a consulting and training company focused on significantly and sustainably improving the performance of manufacturing and process industries.

[Learn more about Marris Consulting](#)





*For our CCPM online course
we are offering a special 30% discount
valid until the 20th of December 2023
Apply the coupon: WEBINAR_SPECIAL_PROMO*

**TOC, CCPM & Lean
Online training**
<https://e-learning.marris-consulting.com/>

LTP Online training
<https://logicalthinkingprocess.podia.com/>

You can boost your improvement process now

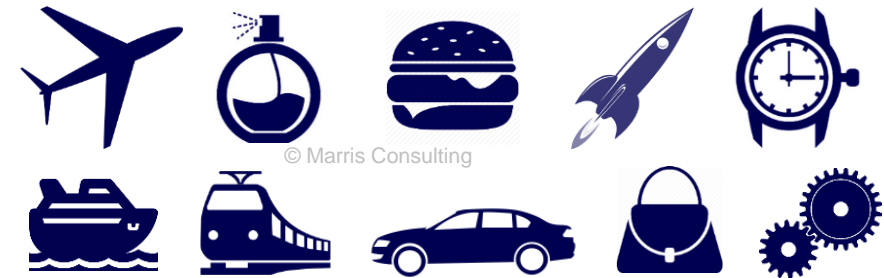
-  Purchase one of our online training courses
-  Or participate in one of our face-to-face training sessions in Paris and in French:
 - Theory of Constraints training on the 28th of March 2024
 - Critical Chain Project Management on the 14th of March 2024
 - Good Lean versus Bad Lean training on the 23rd of May 2024
- We offer all our training in-house and in-person worldwide



We also help organizations in their Critical Chain journey

- We are currently helping 8 companies implement Critical Chain Project Management in many different industries, all over the world © Marris Consulting
- Ask for our 2-day flash diagnostic during which we help you find your bottleneck and the main issues preventing you from improving your performance. The combination of this diagnostic and a one day of training is highly appreciated by our clients.
- We have several different ways of implementing CCPM, it depends on the environment:
 - New Product Development
 - MRO: aeronautical, naval, rail
 - Capex projects
 - Software and IT projects
 - ETO industry (Engineering To Order)





Thank you for your time

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Questions?

Do not hesitate to connect with me on LinkedIn
[linkedin.com/in/philipmarris](https://www.linkedin.com/in/philipmarris)

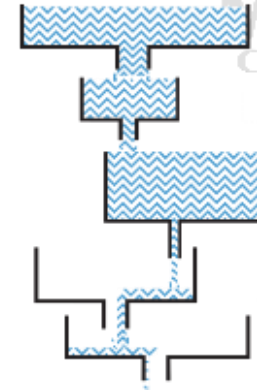


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