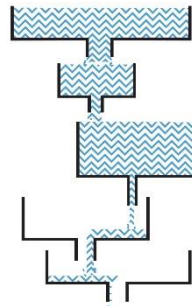


Critical Chain Project Management

Advanced

- *Training material* -

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Consulting

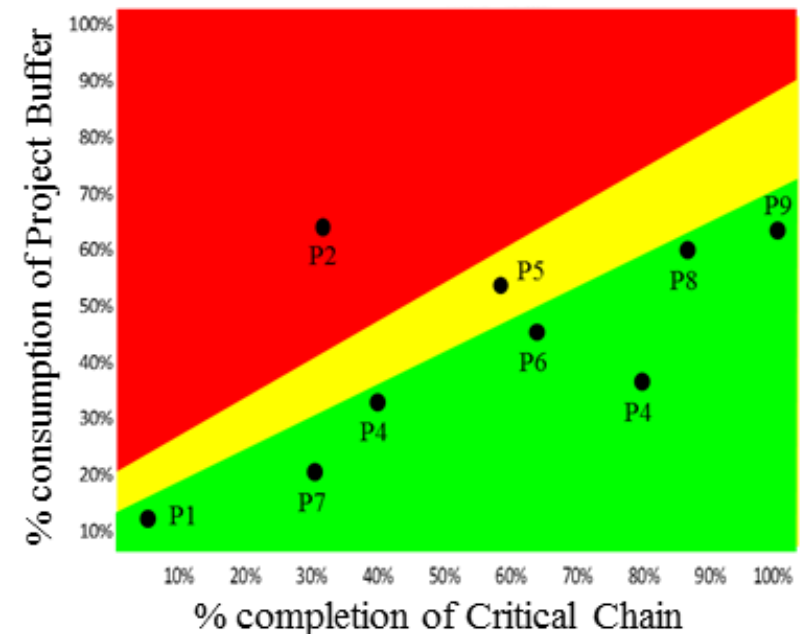


Paris, 24th of May 2019

Version 1.0

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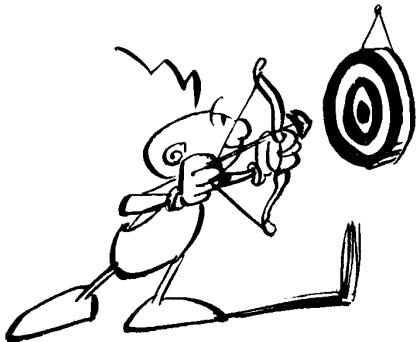
1. Introduction
2. Advanced project scheduling with Critical Chain
3. Identification of the capacity constraint in the project environment
4. Monitoring of project portfolios the Critical Chain way
5. Communication with customers
6. Focused continuous improvement
7. Critical Chain, Lean Engineering & DFSS
8. CCPM software solutions comparison
9. Conclusion



Training objectives

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- Deepen the details of CCPM planning
- Apply CCPM to different types of projects and portfolios
- Identify the capacity constraint in a project environment
- Know the constraints and selection criteria for a CCPM software
- Know how to perpetuate and exploit the benefits of Critical Chain



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Our ambition: to help you achieve all the benefits of CCPM in terms of time, efficiency and speed

- Finish almost all projects on time ...
- ... within budget ...
- ... and the initial specifications.
- Realize the projects 2 times faster.
- Finish twice as much projects per year with the same resources.



For each project typology,
it will be necessary to create its own standard schedule

- The project typology is a tasks networks categorization of different projects in an enterprise. The classification by typology allows you to create a standard schedule according to the project type.

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- For example in a product development portfolio (Research, Development & Industrialization) we can identify different families of projects:
 - Development of (real) new products,
 - Development of a variant or improvement of an existing product
 - Change of production process or material for an existing product
 - Adaptation of a product to a new country
 - Research / Technological watch



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Having standard schedules is a more of a Lean Engineering idea than a CCPM invention

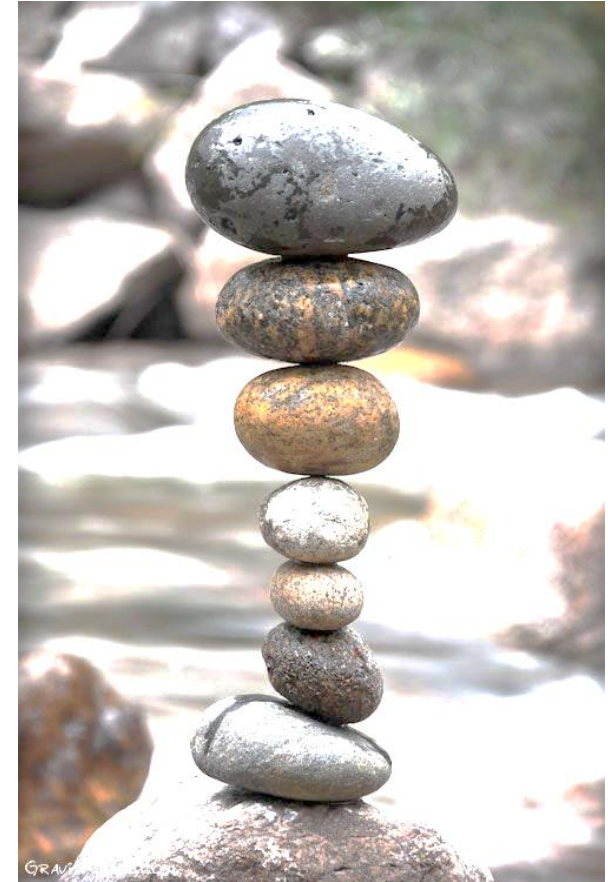
The progressive development of schedules is judicious for long and complex projects

- Long and complex projects are divided into successive phases, each of which can be entrusted to different project managers.
- Some of these phases will only be completed months or even years after the start of the project. So there is not the needed visibility on tasks and resources availability to plan the entire project all at once.
- In addition, CCPM scheduling requires a certain level of detail, so it makes sense to plan precisely the short-term activities, and more macroscopically the medium and long-term activities. As the project progresses, when the expected specifications and deliverables become clearer, detailed phase planning can then be performed.
- This method of progressive development is called *Rolling Wave Planning*.



The Critical Chain is the constraint, the backbone of the project

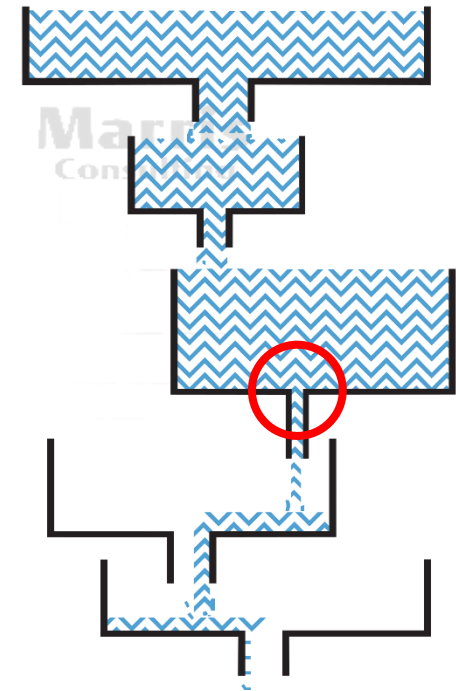
- When developing the project schedule, you must choose and create the "least bad" Critical Chain:
 - To reduce the duration of the project and obtain a project end date accepted by all,
 - To limit the multiplication of parallel tasks with similar durations. This makes the schedule fragile and vulnerable to changes of Critical Chain during the project execution, and it favours the appearance of quasi-critical chains.
 - To keep the Critical Chain in its area of expertise or in the direct control area of the project manager (not having > 50% of his Critical Chain in subcontractors, suppliers, etc. ...)
 - To avoid any poor dimensioning of the project buffer
 - A robust and stable Critical Chain allows the simplification of the communication and the focus of the team.



*Choose its constraint in order to avoid an unstable Critical Chain
and thus reduce the risk of non-compliance with the commitments*

How to identify the constraint in a projects portfolio

- Companies (factories, engineering departments ...) and other organizations inevitably have unbalanced capacities.
- Annual budgets pretend to balance organizations but they don't succeed.
- There is always a constraint somewhere in the system.
- One hour lost on that constraint (the bottleneck)
= one hour lost for the system = one hour of lost sales.
- One hour gained on a non-bottleneck is an illusion. A non-constraint must only work according to the constraint's requirements.
- A dual view is mandatory: different rules for constraints and non-constraints.

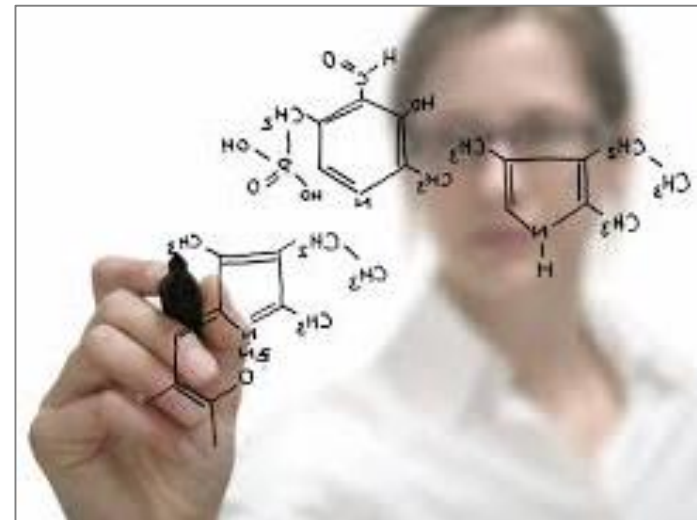
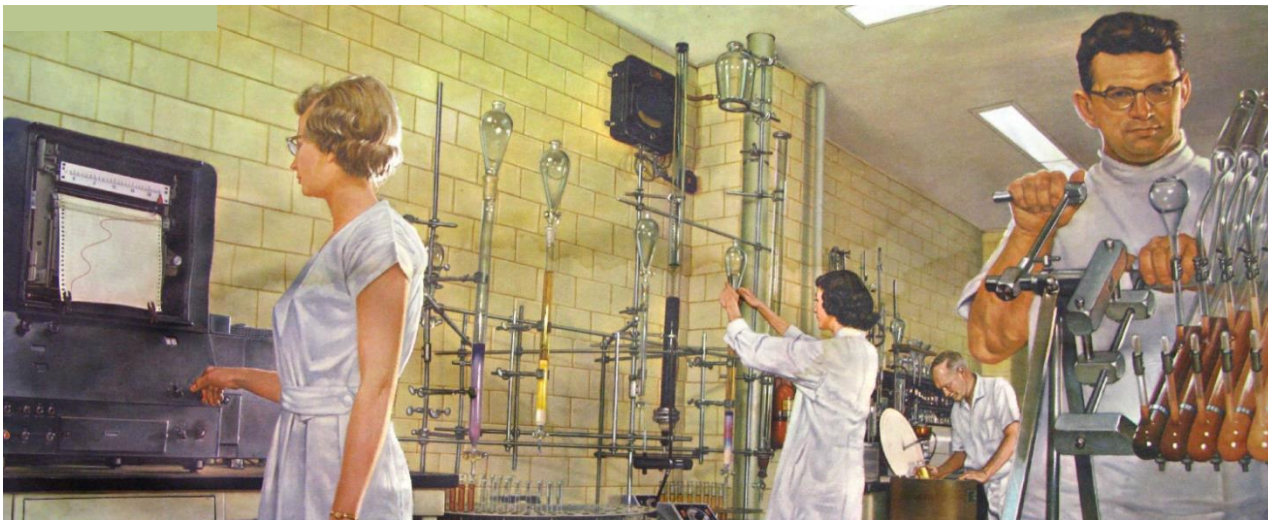


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The sum of local optimums is not equal to the global optimum

Today 75 to 80% of companies are mistaken when identifying their bottlenecks
The percentage is even higher in project environments

- A 280 person R&D department of a leading Animal Health Pharmaceutical firm.
- They thought the constraint was their 19 key research scientists.
- In fact it was their Industrialization Department because of an outsourcing decision 3 years before. This had tripled the workload on these 9 people.
- So the new drugs developed were all waiting for this department to define how and where they were going to be produced.



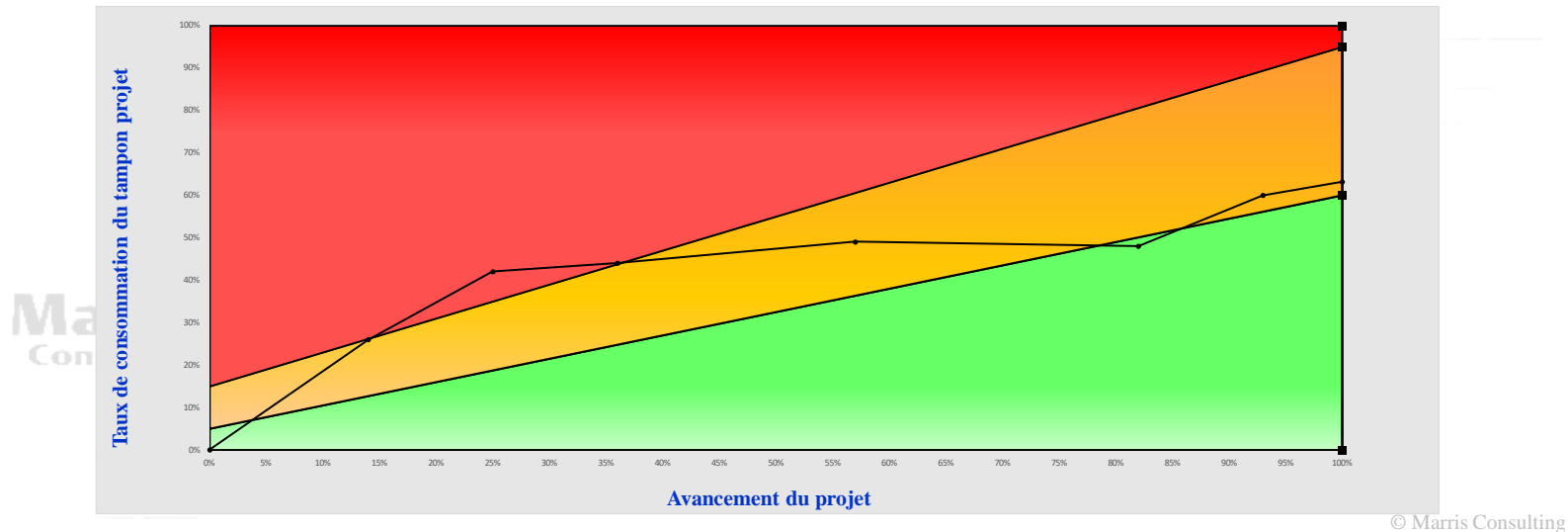
Communication to customers depends on their project management maturity and on the deadlines criticality

- To face their suppliers' delays, customers pad their operations with margins and impose unrealistic lead times.
- The ability for a supplier to ensure on-time delivery increases its power of negotiation and allows him to regain its customer's trust
- CCPM scheduling represents a dialogue and negotiation tool with the customer (taking into account the customer and suppliers needs, communication on the impact of a change of specifications,...)
- CCPM scheduling should be integrated and used from the responses to bid solicitations in order to improve communication between the business manager and the project manager.
- The process of response to calls for tender can also be managed with CCPM (to control the response lead time, and anticipate/control the availability of critical resources).

Customers must gradually understand the advantage provided by suppliers using CCPM

The project buffer is consumed according to the successive realization of the critical tasks

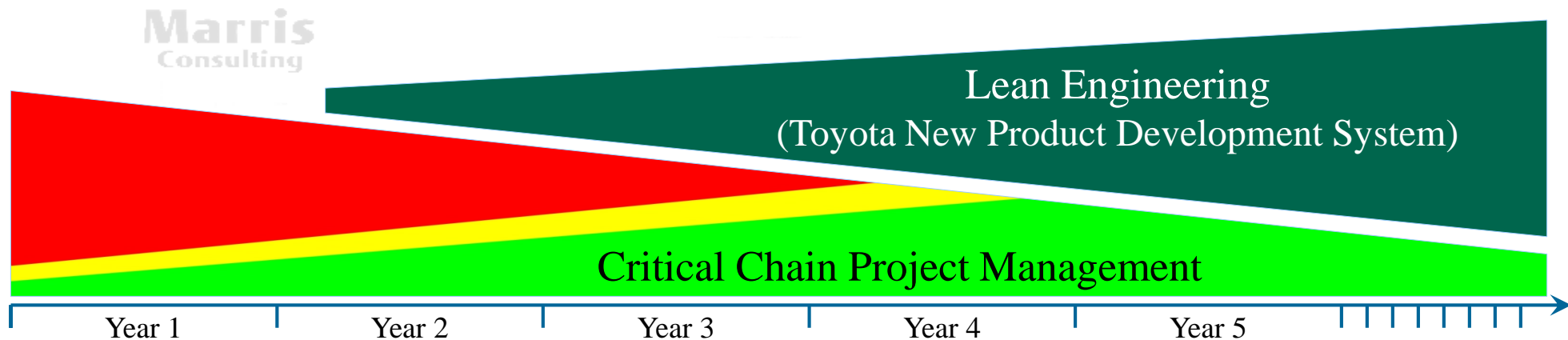
- The project buffer is not always consumed because of uncertainties on individual tasks.
- During each progress assessment, it is important to understand the cause(s) of consumption of the project buffer.
- To maximize the benefits of the Chain Critical method, the analysis of these causes will allow to launch continuous improvement actions during and at the end of each project.




*The "Fever Chart" makes it easy to control a project
but does not analyze the causes of consumption of the project buffer*

For New Product Development projects, CCPM is an ideal predecessor to Lean Engineering

- Lean Engineering or Lean Product & Process Development (LPPD) aims at:
 - Producing better products to satisfy the customers
 - Making production more efficient
 - Improving the process of development « Products and Production System »
- To initiate a real LPPD approach requires to plan and anticipate, to carry out tests, to capitalize on experience and feedbacks.
- But in a chaotic mode, it is not possible to implement such an approach.
- Thus CCPM is required to stabilize the system and free up time for a Lean Product & Process Development implementation.



See Philip Marris' conference on this subject (in French):
"Critical Chain + Lean Engineering"



Conception, développement et Théorie des Contraintes
En quoi la Théorie des Contraintes permet de relever les défis
d'une conception rapide en maîtrisant les risques
- Conférence ProGection / Philip Marris -



Annecy, le jeudi 8 octobre 2015
Version 1.1



Philip Marris



Conception, développement et Théorie des Contraintes
Annecy
Conférence
jeudi 8 octobre 2015
à 17h45
IUT d'Annecy

Conférence ProGection 2015 - 2ème partie
Lean Engineering **20:37**

(Fr) Lean Engineering :
Conférence ProGection 2015 - ...

You Tube

© Marris Consulting

The video: <https://youtu.be/WpoDQpFxEoI>









Conference material: <http://www.marris-consulting.com/formations-actualite/conferences/conference-progection>

Critical Chain deployment requires a software tool adapted to the needs and specifications of the organisation

- Numerous software solutions exist on the market to work the Critical Chain way, including traditional project management software which developed CCPM options, or other editors who propose add-ons or independent software based on CCPM principles.
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- The challenge consists in choosing the right solution depending on the specificities of the implementation, as well as the current and future requirements.
- In addition to the cost it represents, many parameters have to be taken into account to choose the tool.
- We have edited a CCPM software comparison, it includes about ten software, which represent a limited panel only.
- Comparison criteria of this study are not comprehensive, but help to guide the decision.



Comparison of CCPM software

Criteria								
Software Architecture	Web- based	Web-based	Cloud	PC-based	PC-based	Web-based	PC-based	C++ / Java
Mono-project	✓	✓	✓	✓	✓	✓	✓	✓
Multi-projects	✓	✓	✓	✓	✓*	✓	✓	✓
Programme Management	✓	✗	✓	✗	✓*	✓	N/A	✓
Multiple deliverables	✓	✓	✗	✓	✓	✓	N/A	On demand
Fever Chart	✓	✓	✓	✗	✓	✓	✓	✓
Project evaluation	✓	✓	✓*	✓	✓	✓	N/A	✓
Compatible with MSP	Import / Export	Import	Import	Add-On	Add-On	Interface	Add-On	Import / Export
Number of references	> 25	5	15	Free source	> 1000	> 65	N/A	N / A
Comments	Agile resource management, customization	Reporting	Fast implementation for small projects * Tedious evaluation	Compatible with MSP 2003-2007	* OK for ProChain Pipeline & Enterprise	Software and consulting integrated offer		Complex software for important programmes

Critical Chain Project Management: *too good to be true!?*

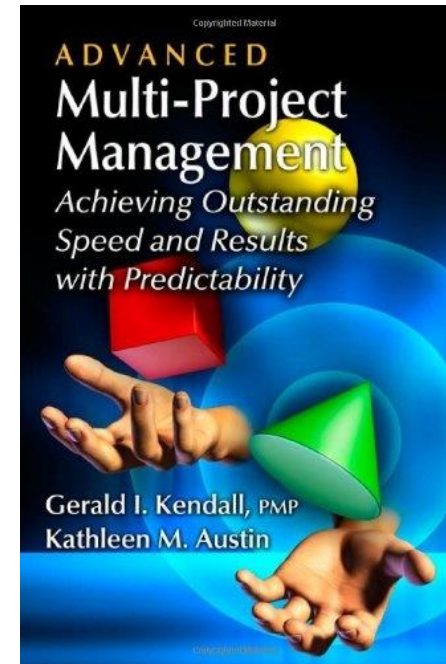
- Finish almost (80% to 100%)
all your projects on time...
- ...within budgets...
- ...and initial specifications.
- Finish projects twice as fast.
- Finish twice as many projects per year with
constant resources.
- Improve quality of life for everybody.



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List of the >350 companies using Critical Chain

3M, ABB, "ABB AG, Power, Tech. Division", ABB Cordoba, ABB Halle, Abbott Labs, Acccoat, "Action Park, Multiforme Grupo", Adirondack Oral & Maxillofacial Surgery, Advanced Energy Technology, Advasense Technologies, Aerojet Corporation, Agilent Technologie, AHIS-St. Vincent Health, Air Force Institute of Technology, "Airgo Networks, (Qualcomm)", Airshow Inc., "Alcan Alesa, Technologies", Alcatel, Alcatel-Lucent, Alfa Lava, Alna Software, AMCC, AMD, Amdocs, American Rubber Products, AMGEN, Andover Healthcare Inc., Applied Plasmonics, AREVA, Arterain Medical, Atomic Energy of Canada Ltd., Avaya, Avitronics, BAE Systems, Balfour Beatty, Barco, Baxter, Bell Canada, BHP Billiton, Bimba Manufacturing, Boeing (Military), Boeing Space & Intelligence Systems, "Boeing Wing, Assembly", Bosal, Bosch Rexroth Ltda., Boston Scientific, Bovis Pharmaceuticals, BP Oil, Brice Manufacturing, BT Radianz, BVR Technologies Company, C.F. Roark Welding & Engineering Co. Inc., C.N. Cotrentes, CAE USA, "Californie, Department of Corrections", Callaway Golf, Celite Corporation / World Minerals Columbia Industries, Celsa Group, Central Dupage Health, Central Nuclear Almaraz Trillo, Chrysler, Clopay, Coca-Cola, Colgate Palmolive, Computer Sciences Corp, Confluence UK, Conoco, Converge Medical Inc., Corning Cable Systems, Cray, Inc., Cueros Industrializados del Bajio S.A., Cytore Therapeutics, Inc., DaimlerChrysler UK, Danfoss, Danisco (Genencor), Del Monte Foods, Delta Air Unes, Inc., Delta Faucet Company, Detroit Diesel Reman-West, Dr. Reddy's Laboratories, DuPont, e2V Semiconductors, Eastman Kodak Company, ECI Telecom Ltd., Eclozion Informatique, Edwards Lifescience, eIRcom, eIRcom, Embraer, emcocables, Emesa, Erickson Air-Crane, Ericsson, Estonian Telephone, Ethicon, ExxonMobil Chemical, Fairchild Semiconductor, Fisher Controls, Fluid Brasil Sistemas E Tecnologia, Fluke Corporation, FMC Technologies, Fonterra, French Air Force, Fuel Cell Energy, Gambro Healthcare, GE Industrial Systems, General Dynamics, Gillette, GlaxoSmithKline, Graftech, Hach, Halliburton, "Hamilton Beach, Brands, Inc.", "Harris, Semiconductor", Hawker Beechcraft, Heineken, Heineken, Spain, Henkel, Hewlett Packard, Hitachi Computer Products, Honda, Honeywell, "HP Digital Camera, Group", IBM, IKEA Trading und Design, Ismecca Europe Semiconductor, "Ismecca, Semiconductor", ITT Canon, ITT Corporation, ITT Space Systems, Johnson & Johnson, Kawasaki Heavy Industries, Ltd., Kraft Foods, L-3 Communication Systems, "LeTourneau, Technologies Inc.", Lockheed Martin, Lord Corporation, LSI Logic, LSI Logic, Lucent Technologies, M&M Precision Systems, Marshall Industries, Marvell, McKee Foods, Medtronic, Medtronic, Medtronic, Europe, Medtronic, Inc., Merck Medco Managed Care, Merichem Chemicals & Refinery Services, Microsoft, Milwaukee Forge, Motorola, NASA, Nike, Northrop Grumman, Numonyx, Oregon Freeze Dry, Owens-Illinois, "Oxford-Radcliffe, Hospitals, UK", P&G Pharmaceuticals, Pharmacia, Philip Morris, Philips Semiconductors, Pioneer, Portsmouth Naval Shipyard, Puget Sound Naval Shipyard, Qualcomm, Railcare Wolverton, UK, Raychem, Raytheon, Rex Materials Group, Roche Diagnostics, Rolls Royce, RSA Security, SAAB Avionics, SanDisk, Sapient, Seagate Technology LLC, Shea Homes, Siemens, "Siemens Generator, Engineering", Skoda Power, Skye Group, Sony Ericsson Mobil Communications, Spectranetics, Spirent Communications, Spirit Aerosystems, Sprint, Sun Microsystems, Sylvania, Symbian, Tadiran Spectralink, Tata Steel, Tecnobit, Tektronix, Tellabs, Tenet Health Care, The Boeing Company, ThyssenKrupp, Timco, Tripod Data Systems, Inc., TRS Refrigeration, TT Technologies, Tundra Semiconductor, Tyco Electronics, Tyco Healthcare, U.S. Air Force (multiple bases), "U.S. Army Fleet, Support", "U.S. Army, Corpus, Christi", "U.S. Marine Corps, (Multiple bases)", Unilever, United Behavioral Health, UPC Technology, US Air Force, Valley Cabinet Works, Vascore Medical, Ventana, Volvo, Von Ardenne, Workscape, Xerox Corporation.



Source: "Advanced Multi-Project Management Achieving Outstanding Speed and Results with Predictability" 2013 book by Gerald I. Kendall & Kathleen M. Austin.

Appendix
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References of Critical Chain implementations throughout the world (#1/10)

Industry	Project Type	Company	Results	Reference
Power	Engineering	ABB AG, Power Tech. Division	Throughput increase over 33% from 300 Bays to 430 Bays per year.	www.realization.com
Power	Engineering	ABB Cordoba	Engineering cycle time reduced from eight months to three months.	www.realization.com
Power	Repair	ABB Halle	Number of projects completed per year increased from 42 to 54, >25%.	www.realization.com
Construction	Theme park design, install, and commission	Action Park Multiforme Grupo	Increased number of projects completed from 121 to 153.	www.realization.com
Communications	Product development	Airgo Networks (Qualcomm)	Cycle time improved from 19 months to 8 months.	www.realization.com
Airport terminal administration and management	Various building projects	Airplan (Colombia)	2 pilot projects : Control tower project & project of terminal extension finished on time	www.tocpractice.com
Aluminum	Engineering	Alcan Alesa Technologies	Number of projects completed increased over 30%.	www.realization.com
Communications	Telecom switch design	Alcatel-Lucent	Increased throughput by 45% per person.	www.realization.com
Software	Software development	Alna Software	Cycle time reduced by 25% and project completions increased 17%.	www.realization.com
Automotive	Product development	Alpine Electronics	Delivery dates compliance rate went from 22% to 88%	www.japan-toc-association.org

References of Critical Chain implementations throughout the world (#2/10)

Industry	Project Type	Company	Results	Reference
Communications	Customized software development	Amdocs	14% increase in revenue/man-month; 20% reduced cycle time.	www.realization.com
IT	IT installation	Avrio (Hitachi Data System)	Remote site installation time reduced by 54%	www.exepron.com
Glass Manufacturing	Engineering (ETO + NPD)	Asahi Seisakusho	+23% throughput (number of projects completed per month), Overtime rate reduced by 35% , +50% increase in revenues with ¥50M in profits	www.realization.com
Manufacturing	Boiler installation	Babcock	Actual versus planned went from +200% to -20%. Between 20% and 55% reduction of manhours. 40% reduction of cycle time	www.tocpractice.com
Aerospace	Aircraft manufacturing	BAE/ RAAF	Reduction of TAT (TurnAround-Time) by 43%	www.exepron.com
Building	Civil Engineering	Balfour Beatty	Project delivered 9.5 weeks earlier than estimated, which was 45 weeks earlier than actually contracted (the contracted delivery date was the client's deadline) - in spite of increased scope of work	www.goldratt.co.uk
Resource	Engineering	BHP Billiton	25% reduction in hours needed to complete project and project finished three weeks early.	www.realization.com
Aerospace	Engineering	Boeing (Military)	Reduced required wing assembly time by 50%.	www.goldratt.com
Aerospace	Design and assembly	Boeing Space & Intelligence Systems	Doubled throughput and decreased cycle time by 28%.	www.realization.com
Aerospace	Engineering	Boeing Wing Assembly	On schedule, under budget. Reduced required wing assembly time by 50% (F-22).	www.goldratt.com

References of Critical Chain implementations throughout the world (#3/10)

Industry	Project Type	Company	Results	Reference
Machine manufacturing	Packaging line development	Bosch Packaging Systems	100% on-time delivery. +27% turnover. 30% cycle time reduction for projects >2500 hours	www.japan-toc-association.org
Communications	IT Professional Services (eg: website)	Bowne & Co (Rapid Solution Group)	Due date performance improved by 30%, lead times reduced by 25%	www.realization.com
Energy	Cleanup	BP Oil	Saving of over \$700 million with accelerated project and production required to meet project needs.	www.pinnacle-strategies.com
Power	Engineering	C.N. Cotrentes	Increased due date performance from 60% to 95%.	www.realization.com
Software	Flight simulation systems	CAE USA	Reduced cycle times by two to four months, with a \$37 million increase in the number of profitable programs.	www.goldratt.com
IT	IT	Caesar	95% of projects on time.	www.tocico.org
Construction	New hospital facility	Californie Department of Corrections	Built and opened new mental hospital in 6 months that other approaches failed to do in 12 months.	www.vectorstrategies.com
Software	IT	Celsa Group	Increased completion of SAP projects from 15 to 20 per month.	www.realization.com
Power	Engineering	Central Nuclear Almaraz Trillo	Increased number of projects completed from 19 to 24-30 per month.	www.realization.com
Automotive	Product development	Chrysler	Cycle time for prototype builds reduced from 10 weeks to 8 weeks.	www.realization.com

References of Critical Chain implementations throughout the world (#4/10)

Industry	Project Type	Company	Results	Reference
Iron ore mining	Truck overhauls	Cliffs Natural Resources Michigan Operations	Overhaul duration reduced by 67%	www.sinclairassociates.com
Financial services	Software development	Confluence UK	95% of projects on time.	www.criticalchain.co.uk
Building	Bank construction	Construtora Veloso	Triple revenues in 2 years. 98% on-time delivery	www.tocico.org
Building	SAP Implementation	Daiwa House	2011 Results after 1st implementation : 26% cycle time reduction for SAP module implementation 2015 Results after 4 years CCPM : +160% of completed projects per year - compared to 2011. >25% gain on project duration for 58%	www.realization.com
Biotechnology	Engineering	Danisco (Genencor)	Increased from 20% projects on time to 87%.	www.realization.com
Aerospace	Repair	Delta Air Lines, Inc.	23% increase in engines produced per year; 30% reduction in engine turnaround time.	www.realization.com
Pharmaceutical	Product development	Dr. Reddy's Laboratories	83% increase in projects completed in first 12 weeks; 75% increase in new product launches year over year.	www.realization.com
Energy	Installation	Duke Energy	Doubled throughput in 3 months	www.realization.com
Semiconductor	Design and manufacturing	e2V Semiconductors	Cycle time reduced from 38 months to 23 months.	www.realization.com
Communications	Network design and installation	eIRcom	On-time delivery improved from 75% to 98%+. Average cycle time was reduced from 70 days to 30 days.	www.realization.com

References of Critical Chain implementations throughout the world (#5/10)

Industry	Project Type	Company	Results	Reference
Communications	IT	eIRcom	From 40% to 90%+ of projects on time; lead time reduced from 150 days to 30 days.	www.toc-goldratt.com
Defense	Electronics	Elbit Systems	Within the Test Equipment department, 70% of on-time or <1-month delay delivery	www.tocpractice.com
Pharmaceutical	Development of Document Management Systems	Eli Lilly and Co	Projects schedule up to 12 months, reduced to 4 months	www.pmiwdc.org
Pharmaceutical	Product development	Eli Lilly and Co	On-time delivery of 100% with Critical Chain versus 60% with traditional project management	www.prochain.com
Aerospace	MRO	Embraer	Aircraft Turn Around Time cut by more than half (from >10 weeks to 5 weeks). Increase of mechanic's productivity by 70%	www.marris-consulting.com
Construction	Manufacturing plant	emcocables	Reduced 11 -month average project duration to 7 months. Increased revenue by 55%, received 4 months earlier.	www.realization.com
Construction	TGV station	Emesa	€ 5 million penalty avoided.	www.realization.com
Refrigerator Compressing Manufacturing	Product development	Embraco	+100% throughput in 4years (number of completed projects per year) & 11% lead time reduction	www.realization.com
Manufacturing	Product development	Emmerson	100% on-time delivery. 75% cycle time reduction	EM Strasbourg 2016 TOC conference
Aerospace	Helicopter manufacturing and maintenance	Erickson Air-Crane	Increased projects on time from 33% to 83%.	www.realization.com

References of Critical Chain implementations throughout the world (#6/10)

Industry	Project Type	Company	Results	Reference
Measurement instrumentation	R&D	Endress + Hauser	+270% throughput, 60% higher reliability	www.a-dato.com
Energy	Engineering	FMC Technologies	50% reduction in test and final assembly time.	www.pinnacle-strategies.com
Military	Repair	French Air Force	Returned two out of five aircraft to Air Force (€ 300 million value).	www.realization.com
Public Institution	Efficiency improvement	Guarantee Fund Lithuania	95% reduction of pending applications. Application lead time reduced by 88%	www.tocico.org
Durable goods	Product development	Hamilton Beach Brands, Inc.	Increased from 34 to 52 new products in first year, 70+ in second year with no increase in head count.	www.realization.com
Semiconductor	Plant construction	Harris Semiconductor	Began full high-tech production in 13 months, instead of 54-month industry norm.	www.goldratt.com
Consumer goods	Product development	Heineken, Spain	20% faster time to market. Improved projects on time from 90% to 98%.	www.realization.com
Data Security and Lossless Compression IP cores	Software integration	Helion Technologies	40% increase in IT integration Throughput in 4 months. 97% of projects finished on time	www.exepron.com
Aerospace	MRO	Helisota	Went from 20 aircrafts/year to 40/year. Reduction of Turn Around Time by 52%	www.exepron.com
Consumer goods	Product development	HP Digital Camera Group	Improved new products from 6 in 2004 to 15 launched in 2005.	www.realization.com

References of Critical Chain implementations throughout the world (#7/10)

Industry	Project Type	Company	Results	Reference
Semiconductor	Engineering	Ismeca Semiconductor	25% reduction in cycle time, from 84 days to 64 days.	www.realization.com
Manufacturing	Product development	Johnston Sweepers Ltd	90% on-time delivery	www.tocpractice.com
Building	Bridge building	Juntos	On Design Department : Due Date Performance increased by 65%, overtime reduced by 20%, subcontractor costs reduced by 40% and CT reduced by 50%	www.tocpractice.com
Building	Building construction	Kimly Construction Pte Ltd	30% reduction in confidence cycle, better alignment of departments & subcontractors involved in various project stages, ability to assess the impact of potential changes	GoldrattInstitute
Energy	Design and manufacturing	LeTourneau Technologies Inc.	Reduced design and engineering from 15 months to 9 months, production engineering from 9 months to 5 months.	www.realization.com
Building	27-floor building construction	Lithuanian building company	27-floor building construction, running late with due date several times postponed, came back under control according to schedule, delivered a month before planned.	www.exepron.com
Aerospace	Engineering and assembly	Lockheed Martin	Cut aircraft full finish time by 57% without reducing scope.	www.goldratt.com
Aerospace	IT	Lord Corporation	Found additional 60% capacity without hiring people.	www.vectorstrategies.com
Semiconductor	Design	LSI Logic	Went from major tool releases were always late to released on time for three years in a row.	www.realization.com
Aerospace	MRO	Lufthansa Techniks Maintenance International	TAT decreased by 15-20%, mechanic's utilization rates increased by 45%	www.realization.com

References of Critical Chain implementations throughout the world (#8/10)

Industry	Project Type	Company	Results	Reference
Medical	Transformation and compliance with new technology and legislation	Maasstad Ziekenhuis Hospital	Within 6 months, number of finished projects/month multiplied by 2, projects lead time cut by half and 95% of projects delivered on time, scope and budget	www.tocico.org
Medical	Product development	Medtronic	Improved software release intervals from 6 months to 9 months to every 2 months.	www.realization.com
Medical	Product development	Medtronic, Europe	Reduced project cycle time from 18 months to 9 months.	www.realization.com
Insurance	IT	Nationale Nederlanden - Groupe Life	Due Date Performance went from 52% to 82%	www.tocico.org
Textile	Capacity expansion	Nakoda	A scheduled 14-month project expected to be finished in May 2013, project finished in January 2013 (10-month duration)	www.realization.com
Supply Chain	Data Systems and S/W integration	NeoGrid	25% improvement in Time and Material Cost Recovery	www.exepron.com
Consumer goods	Sales	Oregon Freeze Dry	Increased number of sales projects completed per year from 72 to 171.	www.realization.com
Glass	Plant engineering	Owens-Illinois	Decreased cycle time from 6 months to 2.5 months.	www.realization.com
Health Care	Emergency room in hospital	Oxford-Radcliffe Hospitals, UK	Increased patients through emergency room from <70% within four hours to 100%, while patient load grew by more than 25%.	www.tocinternational.com
Pharmaceutical	Product development	P&G Pharmaceuticals	Increased projects completed per quarter from five to eight, and on-time rate from 55% to 90%.	www.realization.com

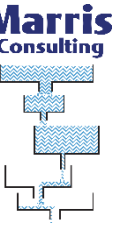
References of Critical Chain implementations throughout the world (#9/10)

Industry	Project Type	Company	Results	Reference
Shoe producer	New Product Development	Plasticaucho	On-time seasonal delivery for new models went from 37% to 78%	www.exeptron.com
Rail	Repair	Railcare Wolverton, UK	100% on-time delivery. Increased from one project at a time to three.	www.realization.com
Defense	New Product Development	Raytheon	Ontime deliveries, cost avoidance, reduction in project duration, etc... example of Tracer Software : duration reduction, schedule went from 71 days to 24. \$1,8M cost avoidance	www.raytheon.com
Manufacturing	Engineering and manufacturing	Rex Materials Group	Lead time down from six weeks to 10 days.	www.cmg-toc.com
Communications	Product development	Ricoh	New teleconference system (P3000) delivered on-time without any compromise on the initial design	www.beingmanagement.com
Aerospace	Product development	Safran Group / Sagem	Reduced the average product development lead time of the entire portfolio by 50%.	www.marris-consulting.com
Aerospace	Factory plant layout modification	Safran Group / Sagem	Total transformation of shopfloor layout. >80% of machines moved. Initial estimate 5 weeks, CCPM result 8 days with 4 hours of buffer unused.	www.marris-consulting.com
Aerospace	Product development	Safran Group / Sagem	Recovery plan for an overdue critical new product development programme. 300 people, 6 facilities. Project deliverables promised to client recalculated and honoured.	www.marris-consulting.com
IT	Product Development	Seagate Technology	Cut New Product Development durations by half	www.stottlerhenke.com
Construction	Home building	Shea Homes	Reduced cycle time by 40% from 91 days to 56 days.	www.vectorstrategies.com

References of Critical Chain implementations throughout the world (#10/10)

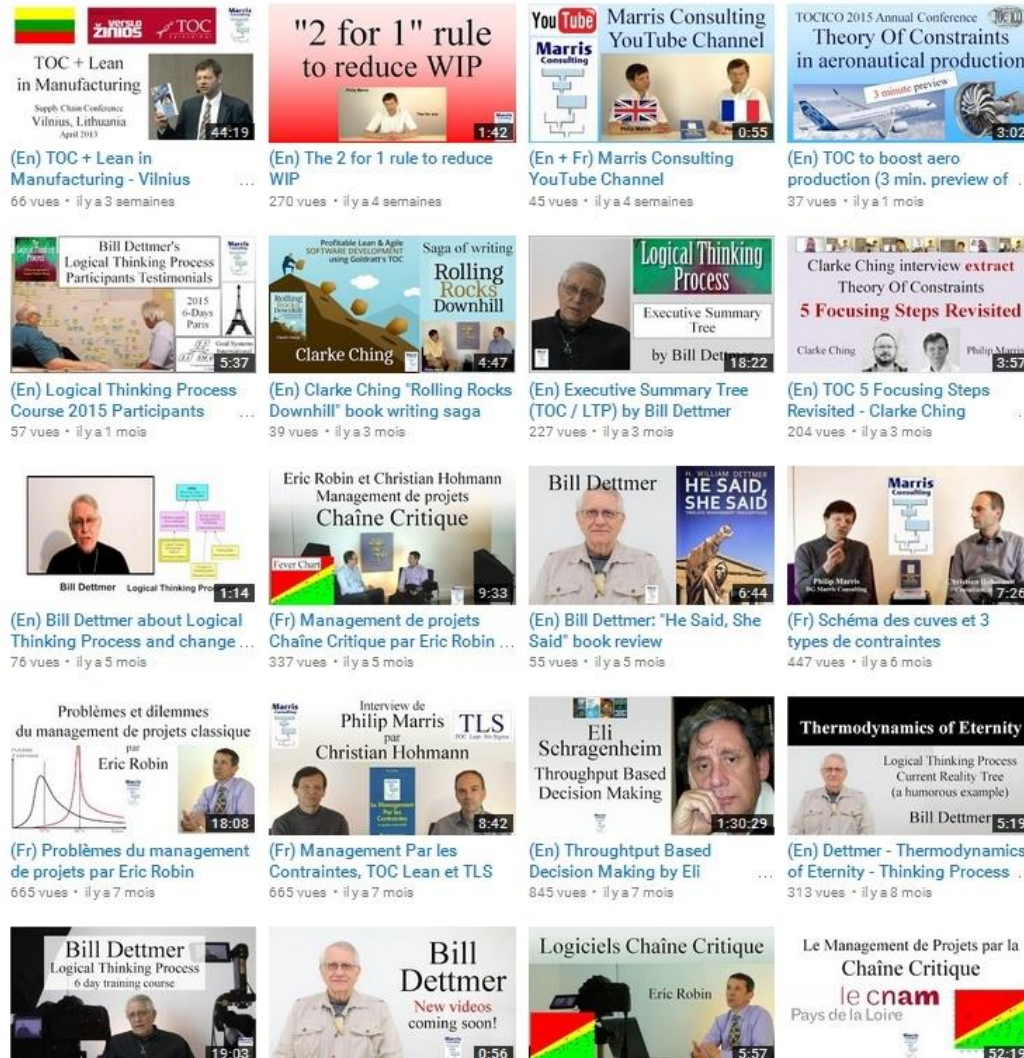
Industry	Project Type	Company	Results	Reference
Power	Engineering	Siemens Generator Engineering	Went from 110 to 128 projects completed, with 30% increase in throughput.	www.realization.com
Power	Engineering	Skoda Power	30% increase in casings per year. Went from 60% to 90% on-time delivery, with 20%+ faster cycle time.	www.realization.com
Textile	Design	Skye Group	100% due date performance with 30% reduction in lead times.	www.realization.com
Aerospace	Engineering	Spirit Aerosystems	Reduced cycle time from 12+ months to 7 months.	www.realization.com
Building	Infrastructure building	Sub-contractor for Wroclaw city	Building roads, tram route, tram/bus station and Wroclaw stadium in order to host the UEFA 2012, all delivered on-time	www.tocpractice.com
Plastic	Mold Manufacturing	Takagi	Overall CT decreased by average 20%, production CT decreased by average 30%, throughput increased by 30% (number of projects completed per month)	www.tocpractice.com
MRO	Aircraft Maintenance	TAM MRO	7% reduction in TAT, ontime performance and quality increased	UNITED STATES SECURITIES AND EXCHANGE COMMISSION - LATAM Airlines
MRO	Aircraft Maintenance	TAP Maintenance & Engineering	21 % reduction in TAT, avoidance of subcontracting expenses	www.mromarketing.aviationweek.com
Steel	Plant maintenance	Tata Steel	68% faster project time; went from 11 -day planned shutdown to 5 days.	www.realization.com

Please note that this list only represents a small part of Critical Chain implementations, many other companies manage their projects with this approach: 3M, Abbott Labs, AMD, BELL, Coca-Cola, FEI, etc....



A video website: Marris Consulting's YouTube Channel

<https://www.youtube.com/user/marrisconsulting/videos>



To facilitate viewing and video selection use the playlists:

- English videos
- Critical Chain videos
- Etc.

A dedicated Critical Chain website (currently only in French)

www.chaine-critique.com

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LA CHAÎNE CRITIQUE

Rechercher... OK

Accueil Chaîne Critique | La méthode en action | Le Quiz Chaîne Critique | Notre point de vue | Cas pratiques | Pour aller plus loin | Nous contacter

La Chaîne Critique : une méthode innovante de gestion de projet

Cette démarche, inspirée de la Théorie des Contraintes (TOC), permet aux chefs de projet de répondre à 2 questions récurrentes :

- Comment réussir un projet en respectant les délais impartis, dans le cadre du budget fixé tout en conservant les spécifications définies par le client ?
- Comment, plus globalement, accélérer les processus de développement et de production ?

🕒 RATIONALISER LA DURÉE DES TÂCHES

👤 ANTICIPER LES CONFLITS DE RESSOURCES

🛡️ **PROTÉGER LE PROJET CONTRE LES ALÉAS**

📊 PILOTER AVEC PERTINENCE LE PROJET

🚀 GÉRER LE MULTI-PROJET

LA MÉTHODE EN ACTION

Accéder à l'animation pour découvrir la démarche

Article sur la Chaîne Critique

Quand le bon sens révolutionne le management de projets

Ecrit par Isabelle Icord et Philip Marris

Nuage de mots

projet méthode formation pert
conférences Gantt gestion de
projet Goldratt chaîne critique
conflit ressource

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A permanent news website dedicated to CCPM

EN:

<http://www.scoop.it/t/critical-chain-project-management>

FR:

<http://www.scoop.it/t/chaîne-critique>

Critical Chain Project Management
"CCPM" Project management approach that is part of the Theory Of Constraints (TOC) developed initially by Eliyahu Goldratt. This is YOUR COMMUNITY. PLEASE SUBMIT your links by logging in and using the SUGGEST BUTTON below.
Curated by Philip Marris

Manage 292 Views Find Share Suggestions 16

Rescooped by Philip Marris from **Théorie des Contraintes (ToC) & CCPM**

Critical Chain Project Management new LinkedIn discussion group

From www.linkedin.com • September 21, 9:56 AM
Group created September 20th 2013.

The goal of this group is to discuss all aspects of CCPM:

- Planning and execution
- Resources: books, websites, presentations...
- Events: conferences, seminars, training sessions...
- Case studies and examples
- Variants according to context: Pharma, Construction...
- New ideas and evolutions
- Managerial (alignment, visual tools...)
- Cultural aspects of CCPM (attitude to commitments and uncertainties...)
- Combination with Agile, Scrum, Kanban...
- Links with standard project management best practices: PMI, Prince...
- Links with Lean (Engineering, Projects...)
- Comments on CCPM software
- Simplified CCPM for simple projects, maybe without software
- General project management issues (such as Work Breakdown structure architectural best practices) especially when CCPM has an impact
- Etc.

Via **Guillaume Maison**

Philip Marris's insight:
I am the administrator of both this webpage you are reading and the LinkedIn group. My goal is that these 2 entities reinforce each other. News and minor/quick/simple comments here and in depth discussions in the LinkedIn discussion group.

Mazda credits Critical Chain Project Management for company turnaround

From www.pr.com • October 6, 3:01 PM

Mr. Mitsuo Hitomi, Executive Officer from the Mazda Motor Corporation Power Train Development Division presented [...] how Critical Chain Project Management enabled Mazda to quickly develop their innovative SkyActiv capability. [He] described the crisis faced by Mazda [...] surviving four straight years of significant financial losses. Mr. Hitomi described the last chance for Mazda to survive by developing technology that would achieve low fuel consumption from an internal combustion engine that would rival a hybrid engine, no compromise in the driving pleasure, and affordable for all customers. The product development cycle had to be cut in half for Mazda to survive. Starting with Critical Chain Project management education in 2007, the momentum grew within the company for holistic project management until the development project duration was cut by half. [...]

Rami Goldratt, CEO of Goldratt Consulting, said, "Mazda gives the world another great example of the power of TOC to generate results previously thought not possible - financially, operationally, and at least as importantly, in the growth and harmony of the people themselves." Mazda has won 73 awards for its SKYACTIV technology as of 20 January 2013 including Japan

Chaîne Critique
Le management de projets et de portefeuilles de projets par la Chaîne Critique ; approche Théorie des Contraintes de Goldratt.
Curated by Philip Marris

Business 292 Views Find Share Suggestions 16

Rescooped by Philip Marris from **Théorie des Contraintes**

5 sites d'information permanente gérés par Philip Marris

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Rescooped by Philip Marris from **Théorie des Contraintes**

Safran E&D - Mise en oeuvre de la Théorie de Contraintes (y.c. Chaîne Critique) en développement produits et en production - 7 mins.

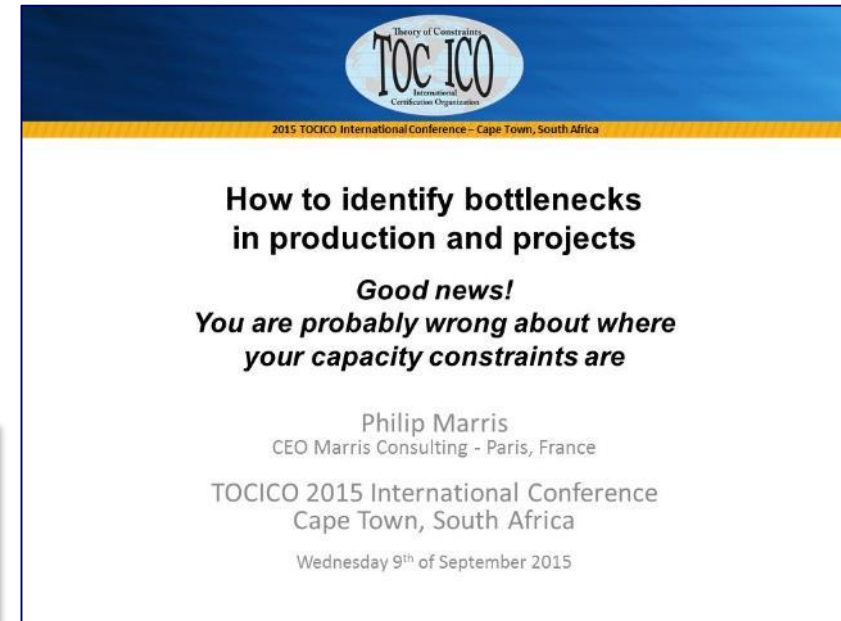
From www.marris-consulting.com • June 30, 2:21 PM

Stéphane Vitrac, Directeur d'Usine chez Safran Electronics & Defense décrit comment son usine a mis en oeuvre la Théorie des Contraintes ainsi que les résultats obtenus. En développement et industrialisation de nouveaux produits, le management de projets par la Chaîne Critique (de la Théorie des Contraintes) a permis de diviser les temps de développement par 2 et de respecter toutes les dates de fin prévues. En gestion de production le pilotage des flux de la Théorie des Contraintes a permis de réduire les cycles de 9 mois à environ 2 mois. L'usine vise maintenant un cycle de 24 heures en repensant totalement le process. Stéphane Vitrac de Safran Electronics and Defense est interviewé par Philip Marris Directeur Général de Marris Consulting.

Rescooped by Philip Marris

2015 Conference: How to identify bottlenecks in production and projects

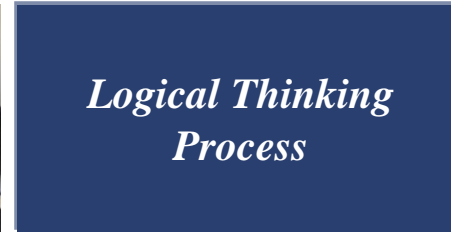
- TOCICO Annual Conference in Cape Town South Africa by Philip Marris.
- PDF available here:
http://www.marris-consulting.com/medias/fichiers/tocico_2015_toc_bottlenecks.pdf
- Video here:
https://youtu.be/ulXqO86OfpU?list=PLuB3wmjsgiuMLT_rrMFfHfQ33X3yf4S



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Marris Consulting hosts over 30 public or internal training sessions every year

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Marris Consulting:

Recognized European Critical Chain experts

■ Our Critical Chain projects:

- Aeronautical, satellite, pharmaceutical, software, rail and aeronautical MRO, ETO & MTO, video security systems, armoured vehicles, luxury handbags, large engineering projects...

© Marris Consulting

■ Our consultants experienced in significantly improving project performance

Marris Consulting

■ Our training sessions:

- Inter-enterprises training “Will you dare to finish your projects on time?” 1 day course, three times a year since 2010. Numerous internal training sessions: 1, 2 or 5 day courses (over 20 a year).

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■ Our websites dedicated to CCPM and TOC

■ Numerous conferences:

- TOCPA Paris (2018), Swiss Quality Association (2017), TOCPA Guangzhou, China (2017), TOC Conference, St. Petersburg, Russia (2017), TOCICO Annual Congress (Theory Of Constraints International Certification Organisation) Berlin (2017), TOCPA Helsinki (2017), Innova Maintenance (2016), Strasbourg, France (2016), Carrefours Excellences, Paris (2016), TOCICO Cape Town, South Africa (2015), ProGection Annecy (2015), Loire Chamber of Commerce France (2015), INSA University TLS Master Rennes (annual since 2014), CNAM Management School 2014, TOCICO Frankfurt (2013), Strasbourg University 2014, Supply Chain Conference Vilnius (2013), ProGection Annecy France (2013), TOCICO Chicago (2012), Carrefour Logistiques Paris (2012, 2011), PIOM Luxembourg (2011), International Pharma Congress, Montpellier, France (2011), ...

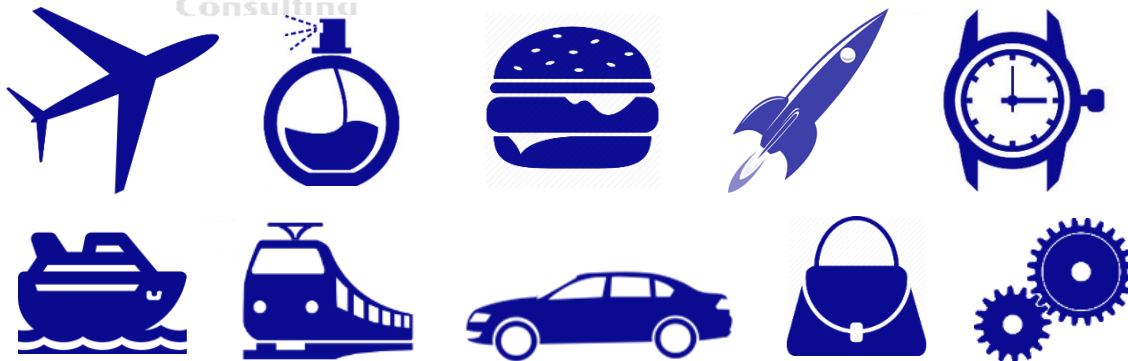
■ Articles regularly published:

- Usine Nouvelle (at least once a year since 2010), La Tribune (2018), Industrie & Technologies (2011, 2010), Pharma Pratique (2011), Railway Gazette International (2011), Maintenance & Entreprise (2011), Logistiques Magazine (2011), Mesures (2010), Innovation & Industrie (2010), Production Maintenance (2010), ...

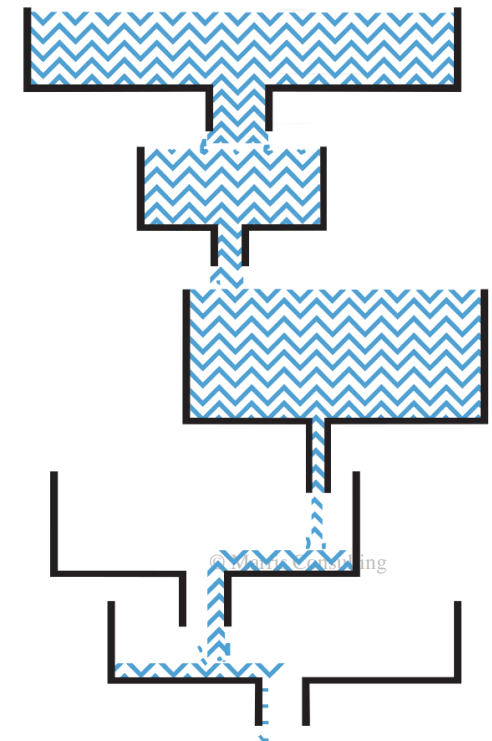
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What we do

- Marris Consulting has a reputation for its capacity to be pertinent in nearly all kinds of industry. We have worked in over 200 companies helping in designing, making, selling and distributing:
 - cars, hamburgers, aeroplanes, perfume, trains, rockets, industrial equipment, pharmaceuticals, home delivery services, computer chips, chips (food), maintenance / repair / overhaul (MRO) of planes and trains, luxury handbags, corrugated cardboard production, the defence industry, Swiss watches, steel manufacturing, plastics, bank notes, satellites, gold mines ...
- We are committed, viscerally, to producing results. Results that are well beyond our clients' expectations. And results that last. Better still we incessantly seek to strengthen the process of on-going improvement; we want to see our ex-clients getting better and better many years after we intervened.



Marris Consulting



How we do it

- We understand that the hardest part of what we do is to change "people". Apart from the pertinent ideas that we must have we must directly and indirectly change individual and collective behaviour.
- We work simultaneously at all levels of the company from the front line to the board room.
- We are recognized experts in many different fields: "Lean" (manufacturing/engineering/management/...), the Theory Of Constraints, Six Sigma, Industry 4.0, DDMRP ...
- One of our key strengths is that we analyse each of our new client's business & culture and then we mix up the right cocktail of solutions. We never impose a so called industry best practise.
- We like simple solutions. Simple is beautiful.



Philip Marris presents the
38th TOCPA Conference program

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



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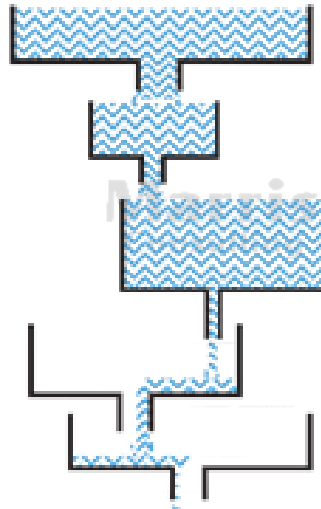
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