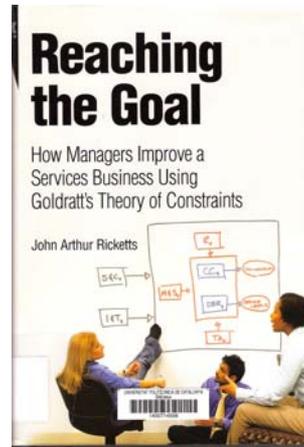


# Reaching the Goal: How Managers Improve a Services Business Using Goldratt's Theory of Constraints

*John Arthur Ricketts*



## Warning:

**Academics complain that there is no theory in  
Theory of Constraints**

*John A. Ricketts (p. 9)*

## James C. Spohrer review:

- “It provides foundational insights for practitioners and researchers seeking a science of service (sometimes called the emergence of Service Science Management Engineering and Design)”.
- “I highly recommend this book to all faculty who are establishing service science courses or degree programs, as well as service researchers and practitioners in industry and government”.

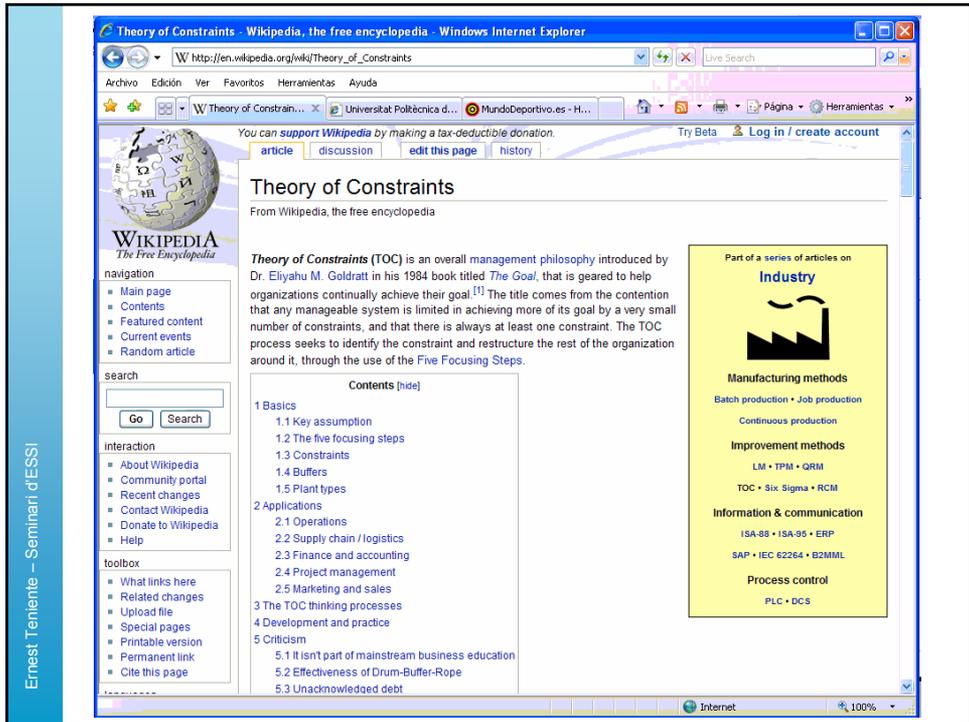


**Dr. James C. Spohrer**  
 Director Service Research  
 IBM Almaden Research Center  
 650 Harry Road  
 San Jose, CA 95120, US

“Services is the application of resources like technologies, information, competence, and skills for the benefit of another”

The screenshot shows a Google search results page for the query "goldratt's theory of constraints". The browser is Windows Internet Explorer. The search results include:

- Web**: Results 1 - 10 d'aproximadament 185.000 per a goldratt's theory of constraints. (0,29 segons)
- [¿Importan sus proyectos?](#) - [www.teoce.com](#) - ¡Lo último en Project Management! Overview y Seminario en Barcelona
- Articles acadèmics per goldratt's theory of constraints**
- [Theory of constraints - Goldratt's](#) - Citat per 409
- [Goldratt's theory of constraints: a systems approach to...](#) - Dettmer - Citat per 178
- [The goal - Goldratt](#) - Citat per 749
- Theory of Constraints - Wikipedia, the free encyclopedia** - [ Tradueix aquesta pàgina ]
- ISBN 0-88427-159-5. **Goldratt, Eliyahu M.** **Theory of Constraints** ... Beyond the Goal : Eliyahu **Goldratt** Speaks on the **Theory of Constraints** (Your Coach in a ...
- [Basics - Applications - The TOC thinking processes](#)
- [en.wikipedia.org/.../Theory\\_of\\_Constraints](#) - Còpia en memòria - Semblants
- [Introducing Goldratt's Theory of Constraints](#) - [ Tradueix aquesta pàgina ]
- Format del fitxer: Microsoft Powerpoint - [Versió HTML](#).
- Introducing **Goldratt's Theory of Constraints**. By Clarke Ching. [www.clarkeching.com](#). Harvey Karp's. HBR. Getting the Most out of Your Product Development ... [www.clarkeching.com/.../clarke\\_ching\\_goldratt\\_toc\\_xpday\\_2004.ppt](#) - Semblants
- Amazon.com: Goldratt's Theory of Constraints: A Systems Approach ...** - [ Tradueix aquesta pàgina ]
- Amazon.com: **Goldratt's Theory of Constraints: A Systems Approach to Continuous Improvement** (9780873893701): William H. Dettmer: Books
- [www.amazon.com/Goldratts-Theory-Constraints.../0873893700](#) - Còpia en memòria - Semblants



## Outline

- Motivation
- The Rise of Services
- Theory of Constraints (TOC)
- TOC Applications in Industry
  - Replenishment
  - Critical Chain
- TOC Applications in Services
  - Resource Management
  - Project Management
- Implementation and Technology
- Summary

## The Rise of Services

- Services are a rising if not a dominant force in many economies today.
- The services management field is still based largely on foundations that can be traced back to the industrial era.
- Enterprises in the services sector now face challenges that have no clear precedents in industry.
- This book is about an updated approach to services management that embraces diversity, distribution and complexity.
- In specific terms, it's about the adaptation of a highly regarded management approach from its roots in industry to the furthest of the services sector.

**This management approach is the Theory of Constraints (TOC)**

## Professional, Scientific and Technical Services (PSTS)

- **Differences between industry and services:**
  - Services cannot start until the customer arrives
  - There can be no inventory of completed services
  - Customization
- **Services on Demand** (as opposed to Services as Available):
  - Responsive, Variable, Focused and Resilient
- **PSTS sector is unique because it is the only sector where:**
  - The primary output is services, but sales are made on expertise
  - The degree of customization for specific clients is extremely high
  - Reliance on intellectual capital is quite high
  - Workers are typically assigned to serve specific clients
  - Repeatability of process is relatively low

## Theory of Constraints (TOC)

**“All enterprises are constrained by something”**

*If they weren't, they could grow as large and as fast as they wanted.*

**“A constraint limits what can be produced as a whole”**

### ■ Kinds of Constraints

- **External constraints:** are said to be in the market when clients do not buy what all the service provider could deliver.
- **Internal Constraints:** occur when the provider does not have enough capacity to deliver all the services clients would buy.
- **Interface Constraints:** apply when something at an interface prevents the provider from delivering more service, and thereby preventing the client from consuming more service (as desired).

## Applying TOC

### ■ Steps in applying TOC:

1. To figure out precisely where the constraints are.  
*What separates constraints from noise?*
2. To utilize the constraint to its fullest extent.
3. To make sure that nonconstraints keep the constraint busy.  
*Often this means that the nonconstraints have to be dialed down.*
4. To improve productivity of the constraint, *because lifting its performance is the only way to lift the whole performance.*
5. To repeat the previous steps.

## Warning (revisited)

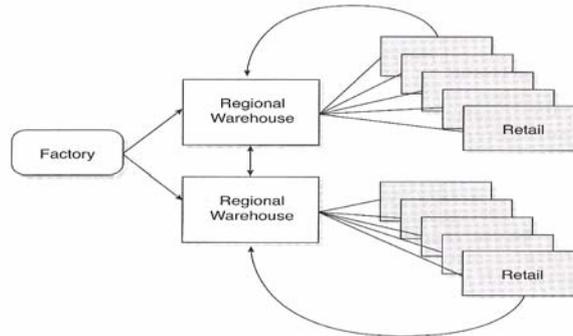
- Academics complain that there's no theory in Theory of Constraints, ...
- ..., while managers dismiss anything called a theory because its sounds so disconnected from the real world.
- Fortunately, neither viewpoint is entirely correct. TOC is grounded in the real world because it has evolved on what actually works in practice.

**So, if you're put off by theory – or the lack of it – do what others have done, and refer to TOC as constraint management.**

## TOC Applications in Industry

- Drum-Buffer-Rope
- Replenishment
- Critical Chain
- Throughput Accounting
- Implications for Services
- ... (many) others?

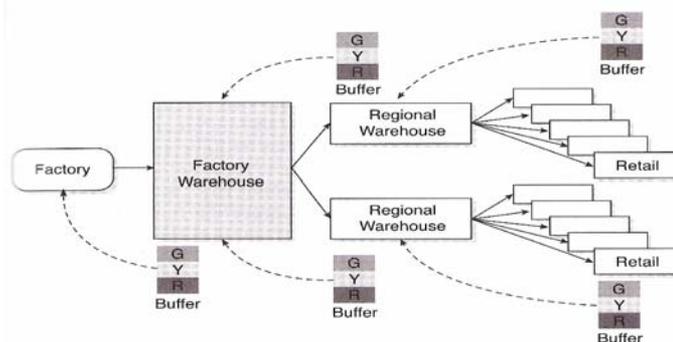
## Replenishment: Traditional Distribution



- It looks appealing: **only retail outlets make sales to customers.**
- However, **variability in sales is highest at retail locations**
  - Some retailers may have an abundance of some products while others not.
  - There's seldom an easy way to move inventory between retail locations.
  - When stockouts occur, the time required to restock a retailer may turn out into lost sales.

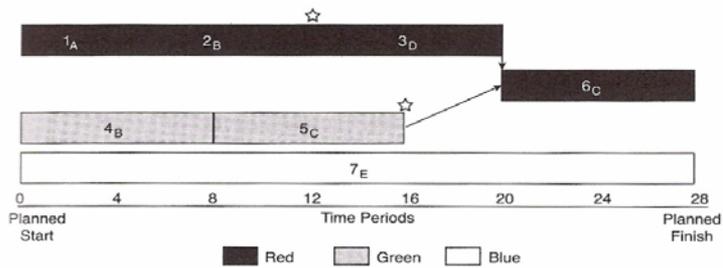
## Replenishment: TOC Application for Distribution

A sales constraint is broken by selling customers what they want, when and where they want it and at a price that corresponds with the perceived value.



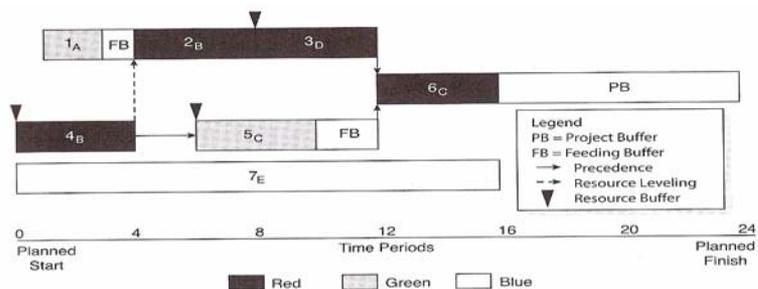
- Replenishment relies on aggregation to smooth demand.
- Replenishment is driven by actual consumption, not by sales forecast.
- Buffer sizing is based on variability and time to resupply.

## Project Management: Critical Path



- The **critical path appears to be the constraint**, because it determines the shortest time in which the project can be completed.
- However, **resources are a far less obvious constraint** hiding in plain sight in many project plans.

## Critical Chain: TOC Application for Project Management



- **The Critical Chain differs from the Critical Path because:**
  - All estimated task durations have been cut in half.
  - Resource contention has been resolved via resource leveling.
  - Tasks do not start until needed but must be completed asap once started.
  - A project buffer has been added at the end of the project.
  - Feeding buffers have been created where noncritical tasks precede critical ones.
  - Resource buffers have been inserted to remind resources of upcoming tasks.

## TOC Applications in Services

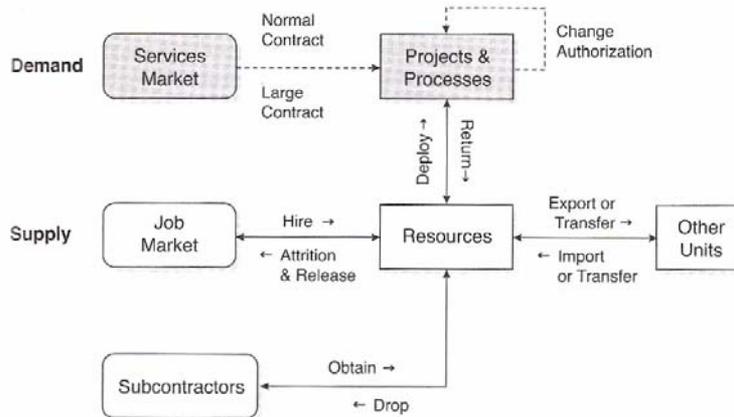
- **Resource Management**
  - The application of Replenishment to Services
- **Project Management**
  - The application of Critical Chain to Services
- ...

## Replenishment for Services ( $R_S$ ): Resource Management

- Resource management is a critical function in any services enterprise.
- Equipment is insufficient without human resources who have the knowledge to use them effectively:
  - A hospital is just another building without doctors, nurses and technicians.
- In PSTS, **getting skilled resources** when and where they are needed can be a constraint:
  - If the right resources aren't available it may be impossible to close the sale.
  - If key resources are lost after the sale, it is impossible to achieve client satisfaction.

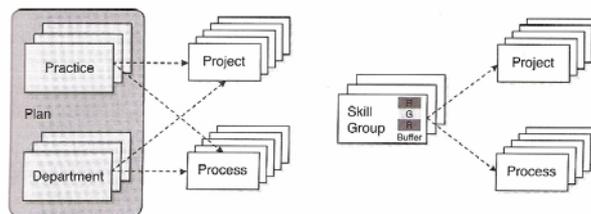
**Replenishment for Services ( $R_S$ )  
is aimed at providing skilled resources when required**

## $R_S$ : Demand and Supply in PSTS



## Replenishment for Services ( $R_S$ )

- Even though supply and distribution in services differ from industry, the **basic principles behind Replenishment are still valid**:
  - Aggregation reduces variation.
  - Buffers sized according to average demand protect against shortage.
  - Buffer zones provide a convenient reference that tells managers when action is required.



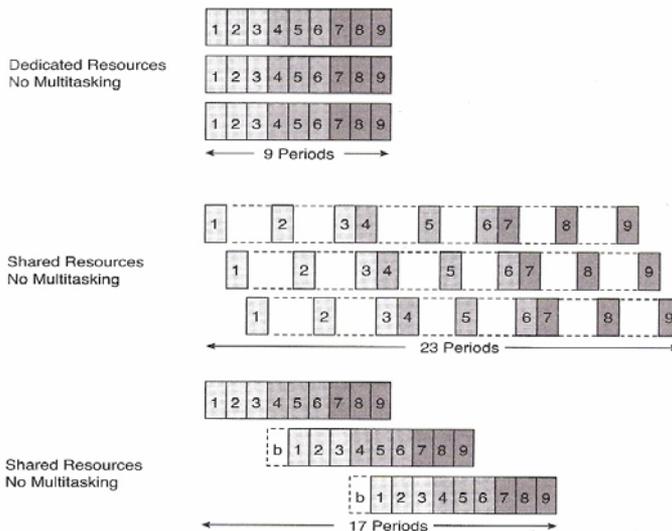
*Deciding how to group resources is the first step in applying  $R_S$*

## Critical Chain for Services (CC<sub>S</sub>): Project Management

- CC for a single project is perhaps the most readily application adoptable in services.
- The reason is simple: **many services are delivered as projects**, and CC can be used without modification on any services project.
- However, **service providers rarely conduct projects in isolation**.
  - Therefore, *multi-project Critical Chain (MPCC)* is needed.

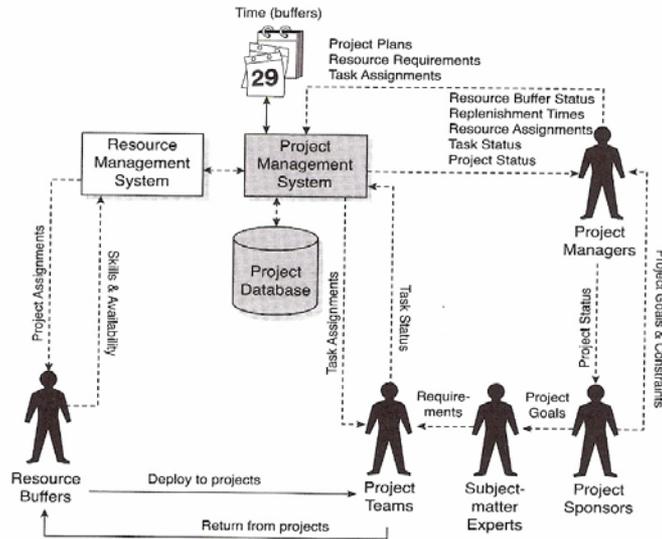
**Multi-project Critical Chain (MPCC),  
as originally conceived, does not support services on demand**

## MPCC: Multi-project Scenarios

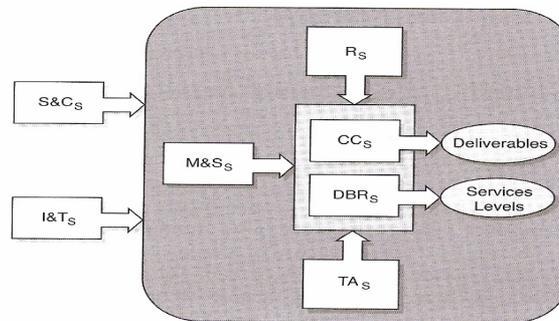




## Implementation and Technology: Project Management System based on CC<sub>s</sub>



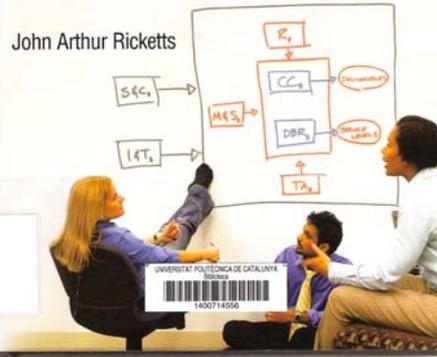
## Summary: Theory of Constraints for Services



- **Critical Chain (CC<sub>s</sub>)** produces deliverables from projects.
- **Drum-Buffer-Rope (DBR<sub>s</sub>)** produces service levels from processes.
- **Replenishment (R<sub>s</sub>)** provides skilled resources.
- **Throughput Accounting (TA<sub>s</sub>)** provides key information.
- **Marketing and Sales (M&S<sub>s</sub>)** closes deals.
- **Strategy and Change (S&C<sub>s</sub>)** sets strategy and gets buy-in.
- **Implementation and Technology (I&T<sub>s</sub>)** puts TOCs into practice.

# Reaching the Goal

How Managers Improve a Services Business Using Goldratt's Theory of Constraints



**Moltes gràcies !**