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Scenarios & trends of evolution in the industrial systems

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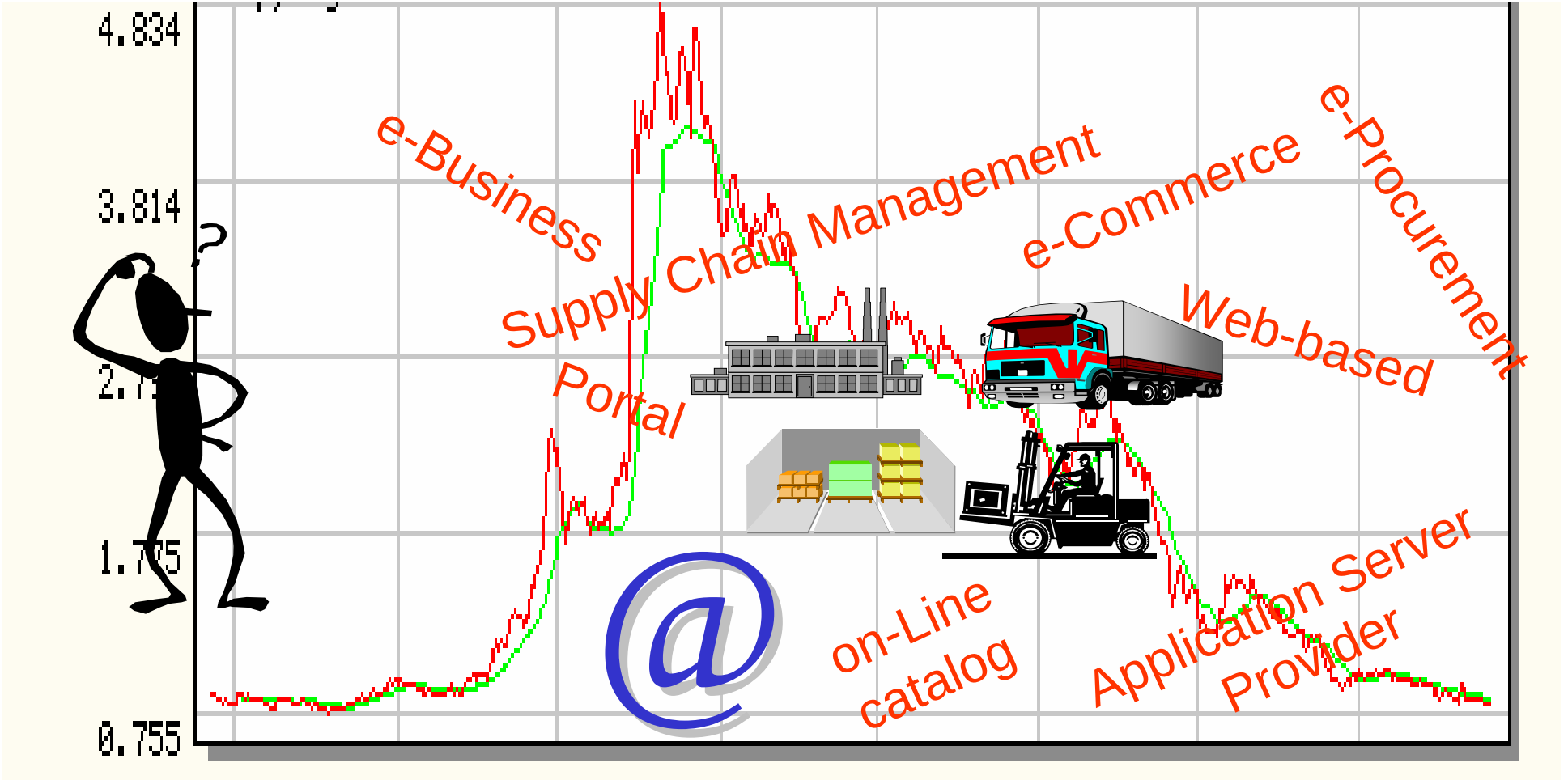
The “New Economy”



Even if super-effective, your marketplace doesn’t load a truck

Agenda

- Supply Chain Management – key concepts
  - Core ideas, processes source-make-deliver
  - Performance and trade-off
  - Supply chain strategies
- Trend and main challenges

The relevance of a “right” management of Operations & Supply Chain

- 1950: Toyota produces on a day what Gm produces in a year
- 1980: Toyota reaches an amount of sales so high to lead USA automotive industry to a crisis and to compete easily with GM, Ford, Daimler Chrysler
  - …realizing a product that is better on a quality level, at lower costs, and with a higher client service…
  - …thanks to the fact that Toyota has considered Operations and Supply Chain Management as the central elements of its strategy

The relevance of a “right” management of Operations & Supply Chain

- It takes a typical box of cereal more than 3 months to get from the factory to the supermarket
- It takes a typical new car, on average, 15 days to travel from the factory to the dealership. The actual travel time is no more than 4 to 5 days
- P&G saved retail customers $65 million over the past 18 months (collaboration)
- Enel saved over €10 mln by using auctions in the purchasing process
- National Semiconductor reduced distribution costs by 2.5%, decreased delivery time by 47%, and increased sales by 34%
- Wal-Mart best practices have cut the cost of sales by 3% compared to the industry average
- Lucent Technologies obtained $100 mln stock-out reduction and $3 mln inventory reduction by collaborating with its suppliers

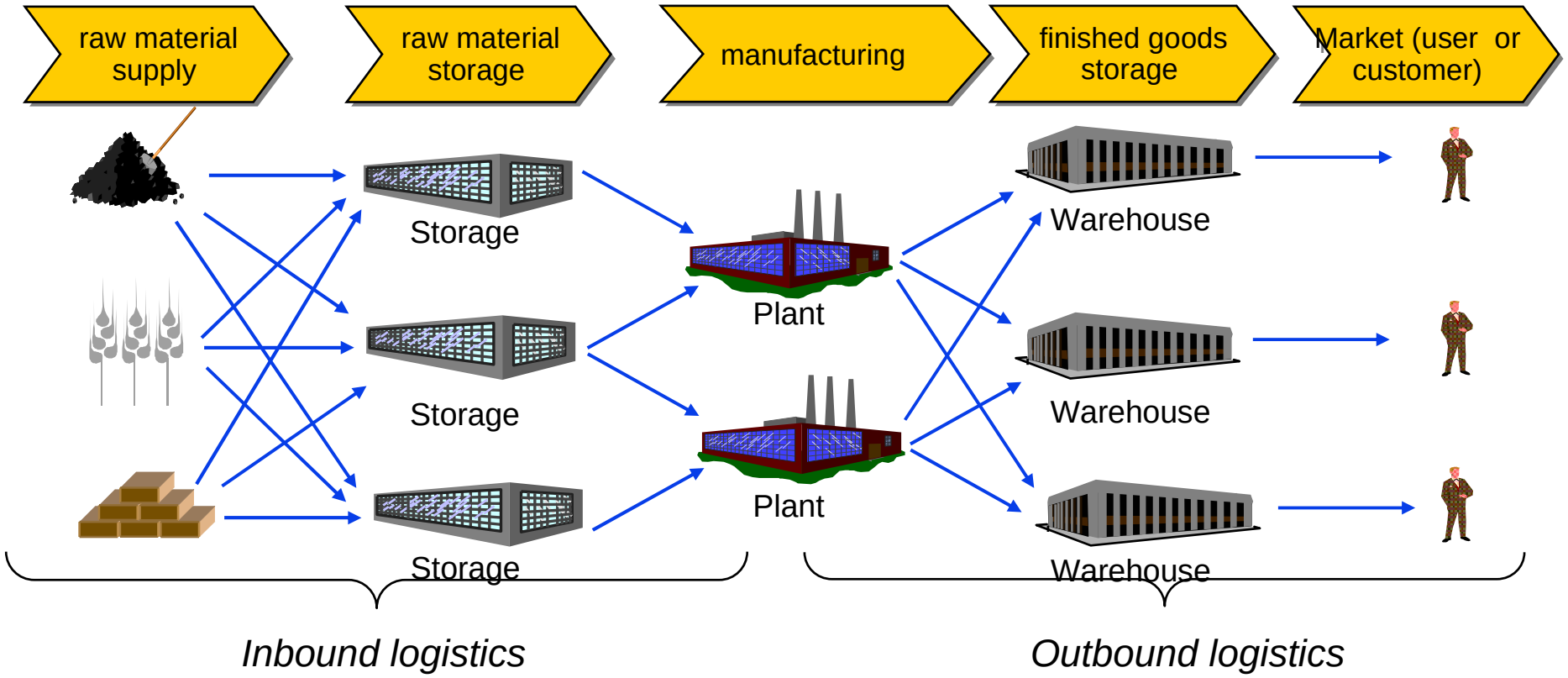
The logistic macro-process

- Activities and decisions connected to the management of:
  - Physical flows of materials and goods from the source to consumption points.
  - Information flows from final users to the sources.

- Logistic system: all the infrastructures, tools, human resources and management policies that allow the needed physical flows and information flows

The supply chain

•"All the different actors, infrastructures, resources, processes and activities (and the links between them) that attend from the sourcing of raw materials, to transformation in semi-finished products and finished products to distribution of finished products to clients"



Logistics Vs. SCM

•SUPPLY CHAIN MANGEMENT

•"Supply chain management is the integration of business processes from end user through original suppliers taht provides products, services and information that add value for customers".

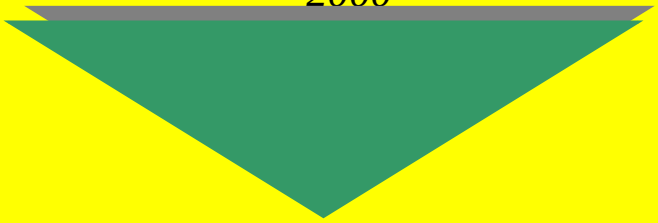
•*The Global Supply Chain Forum*

•Supply Chain Management is regarding all the company processes at strategic and tactical level and not only the logistics processes (e.g. product development)

•LOGISTICS

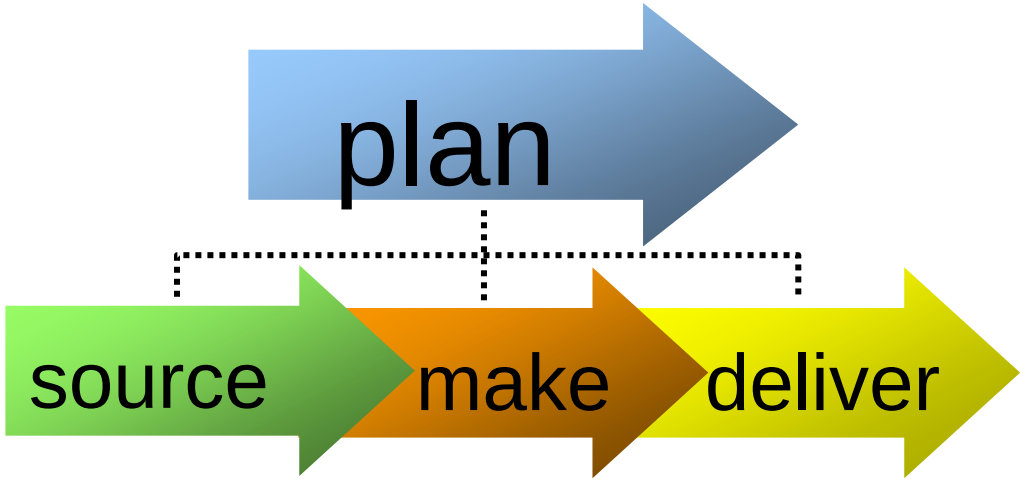
•"Logistics is that part of the supply chain process that plans, implements and controls the efficient, effective flow and storage of goods, services and related information.."

•*CLM (Council of Logistics Management), 2000*



• Logistics is regarding specific issues that do not belong to the concept of Supply Chain Management (es. material handling, warehousing, etc.)

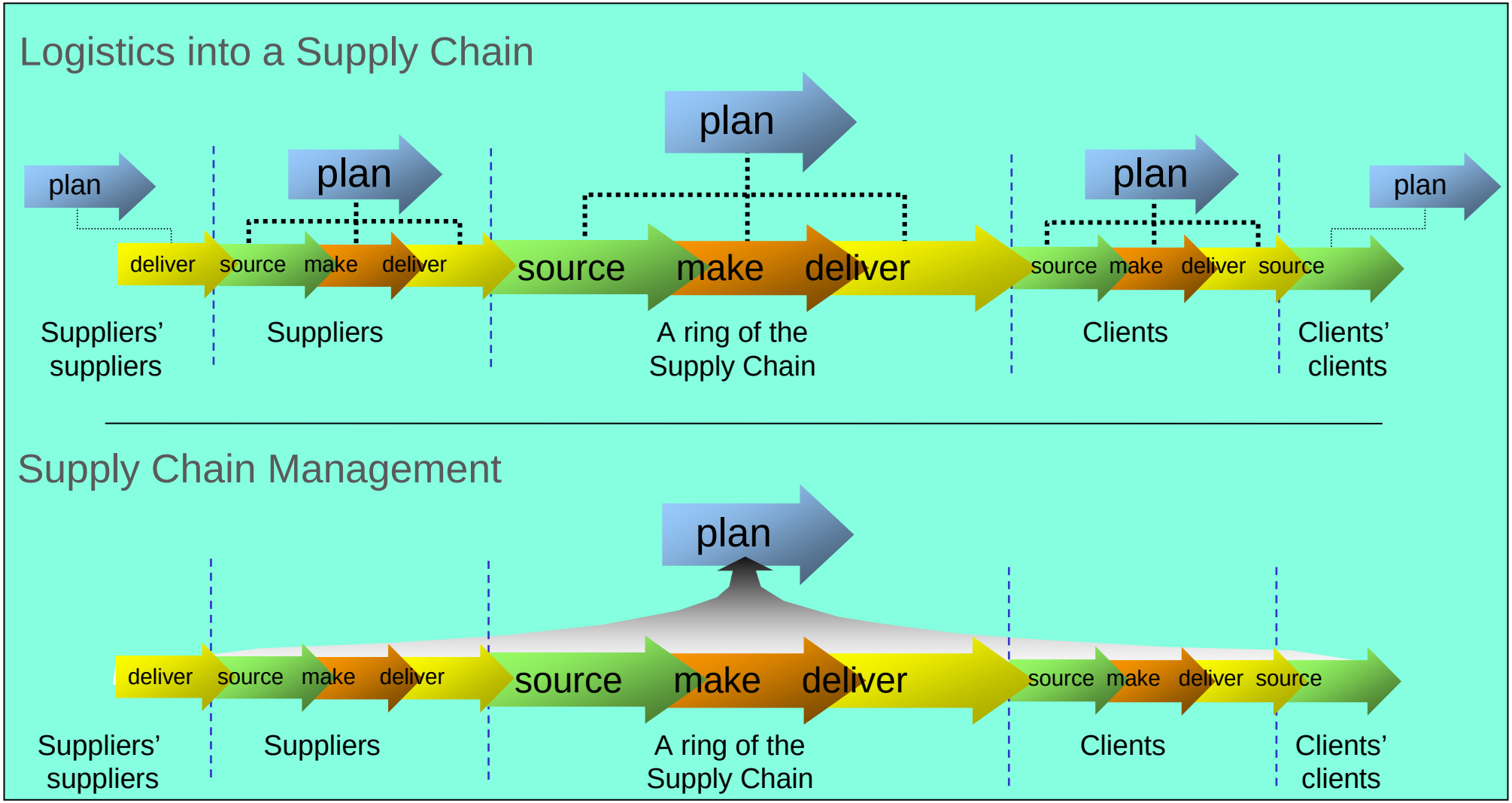
Logistic and supply chain management



Process of planning, management and control of the effective and efficient supply, flow and stock of goods, services and related information from the point of origin to the point of consumption to satisfy clients needs (internal or external).

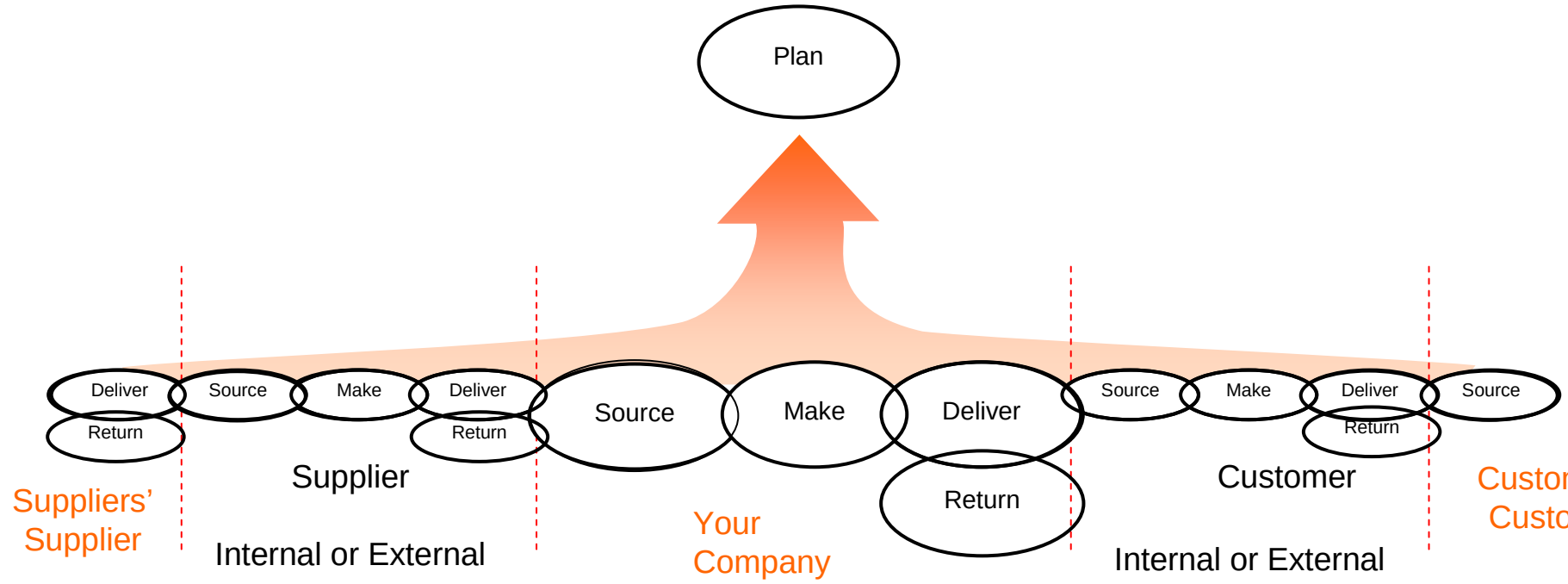
Font: adapted from Council of Logistics Management

From Logistics to Supply Chain Management

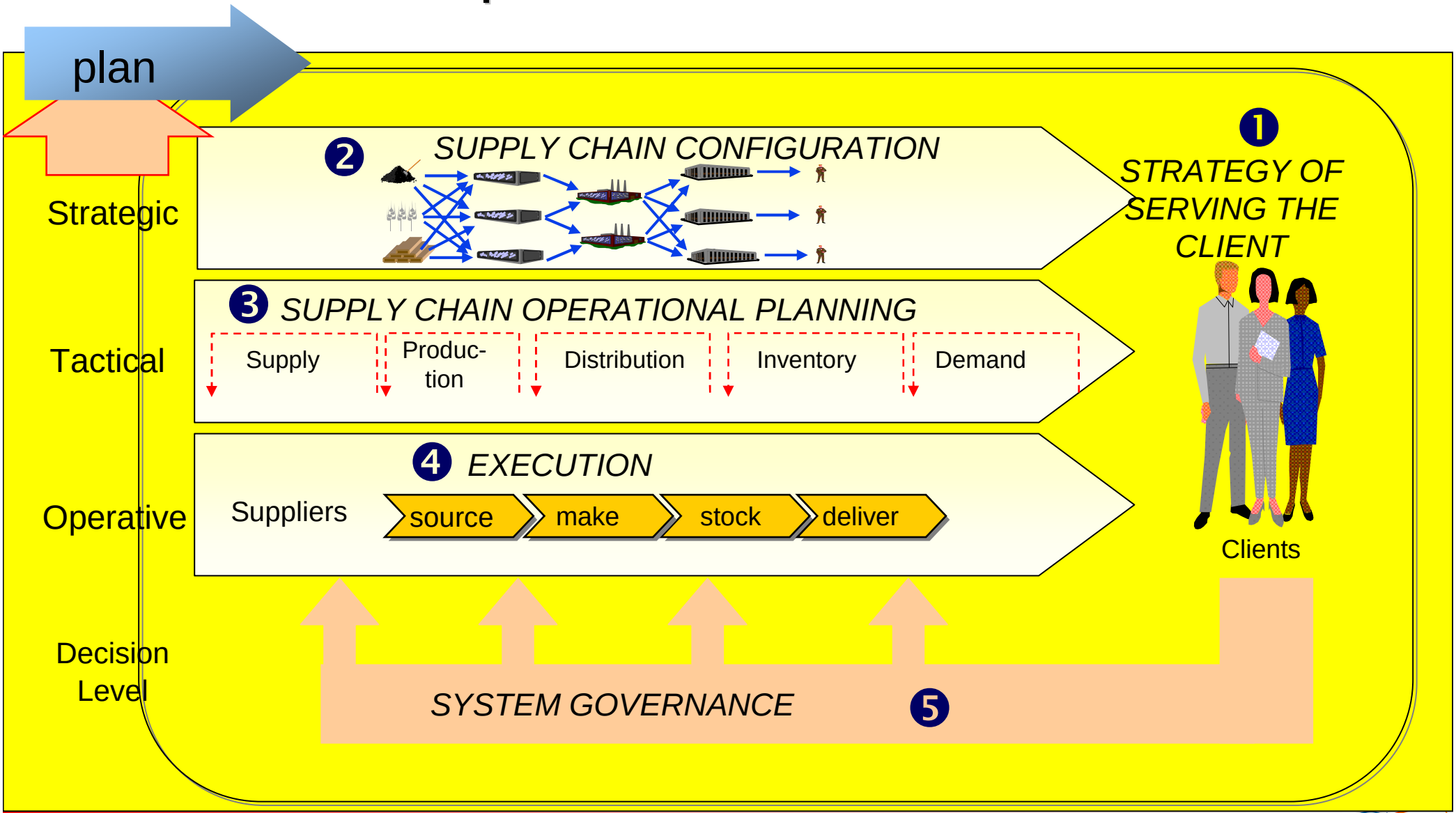


From Logistics to Supply Chain Management

- Enlargement from the single firm to the clients, the suppliers, the suppliers' suppliers, ecc…
- Not only infrastructures but especially issues regarding management and information coordination between actors



The decisions – the problems



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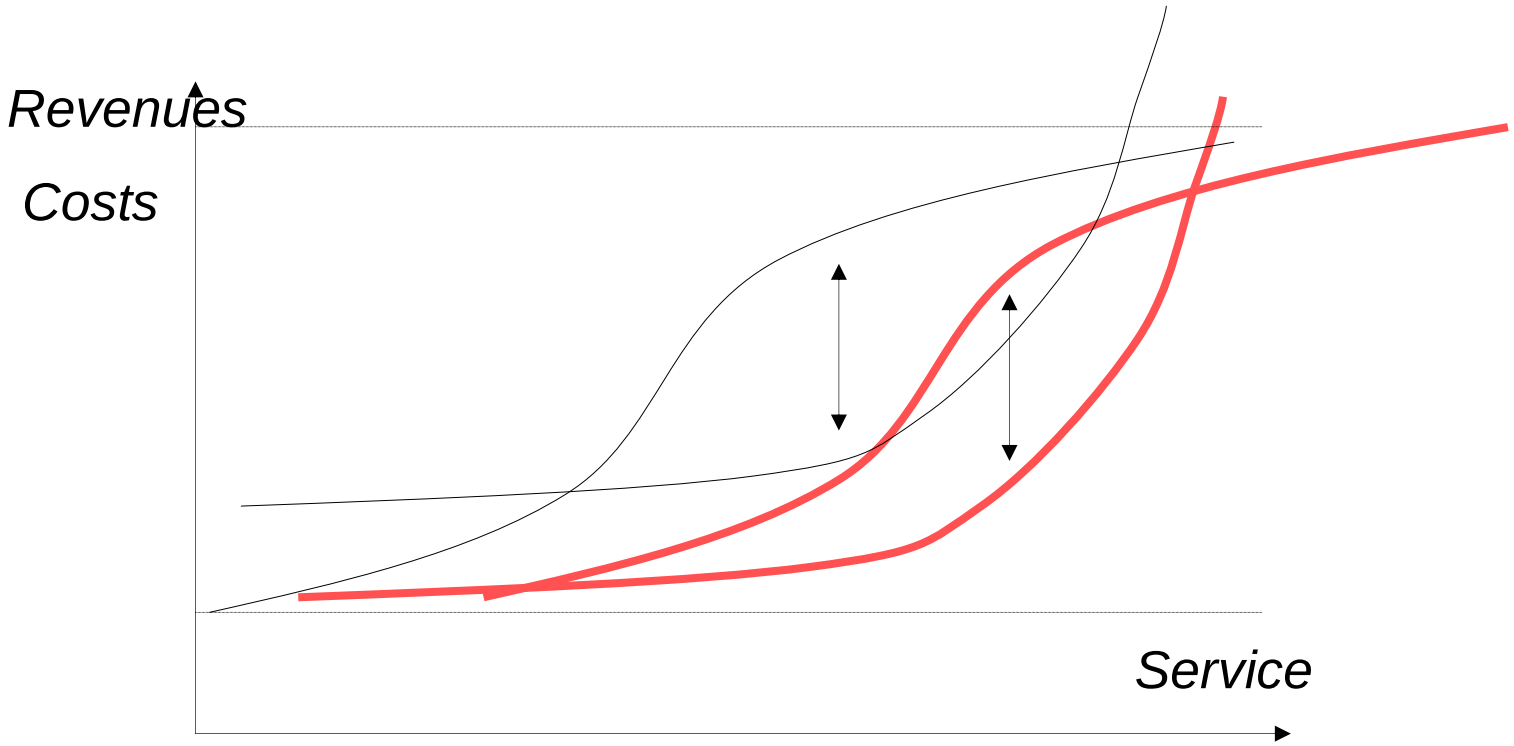
Classical performances…

- PRODUCTIVITY
  - Capital (fixed and circulating), materials and labour
- QUALITY
  - Compliance, Project, Durability and Maintainability
- FLEXIBILITY
  - Product, Volume, Mix, ...
- SERVICE
  - Customizzation (flex), timeliness and punctuality, after sale, delivery flexibility

…translated into “logistical” perfomances

- SERVICE LEVEL
  - Multidimensional concept
- LOGISTICAL TOTAL COST
  - Cost to provide a certain service level



Logistic costs in US and EU

- Distribution costs (% of turnover / +/- trend)

	US	EU
• Inventories	1,64%??	1,51% ??
• Admin	0,35%-	0,52% -
• Order management	0,59%-	0,94% -
• Fixed assets	1,90%	2,22%
• Transportation	2,84%+++	2,72% +++
• Total	7,22%	7,80%

  - Herbert Davies (400 companies)

Service level

- Alcatel (TLC)
  - Comply with delivery terms
  - Report on delivery forecast
  - Correspondence between packing list, documentation and delivered material
  - Physical integrity
  - Spare parts available in the long run

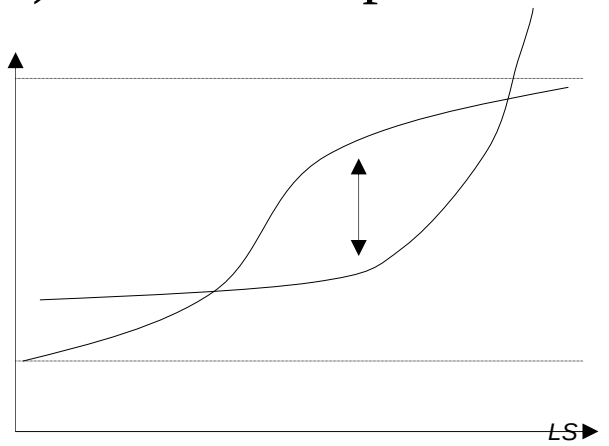
- Barilla (food)
  - Cycle time of order fulfilment
  - Dependability
  - Correspondence between packing list, documentation and delivered material
  - Minimum acceptable order size
  - Maximum frequency of order processing
  - Physical integrity
  - Rush orders
  - Change orders
  - Order tracking

Effects of poor service

Behaviour **Product**	Buy same brand, different package(%)	Buy another brand (%)	Delayed purchase (%)	Search in another store (%)	Buy a substitutive product (%)
Coffee	19	**41**	15	21	4
Tea	2	34	12	**48**	4
Soft Drinks	10	29	15	**36**	10
Butter	3	**55**	16	24	2
Detergents	8	**37**	17	**38**	0
Canned vegetables	18	**61**	8	12	1
Toilet paper	0	20	**40**	**39**	1

Cost/ service trade-off management

- Budget approach
  Given the LTC, logistics choices to max SL
- Marketing approach
  Definition of the SL (level of the marketing mix). Logistics management to minimize LTC
- Analytical approach
  Concurrent definition of LTC and SL. Economic evaluation of the cost of the “lost” service (e.g. stock out cost) Trade-off optimization



SCM issues depend on the context

- COMPLEXITY
  Variety of the elements that should be known in order to manage coherently the process of Supply Chain Management

- UNPREDICTABILITY
  Reliability of the information and knowledge needed to manage the process

	Low Complexity	**High Complexity**
High Unpredictability		
Low Unpredictability		

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The “structural” (phisycal) evolution of the SC vs the context corporate strategy

Supply chain configuration drivers (RST)

The evolutionary steps of supply chain

Supply chain through the past century

What’s next?

“A look at the past”

Evolution of SOCIAL CONTEXT

Evolution of TECHNOLOGY

Evolution of RELATIVE IMPORTANCE of COMPETITIVE VARIABLES

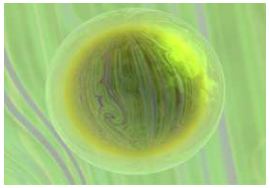
How does the industrial model change as a consequence?

Supply chain configuration drivers

- *Saturation*: Market Demand vs Production Capacity
- *Standardization* of Demand
- *Resources*: access to convenient production factors
- *Transaction Costs*: vertical integration
- *Supply* market: availability of specialized suppliers

R S^3 T

Supply chain evolution



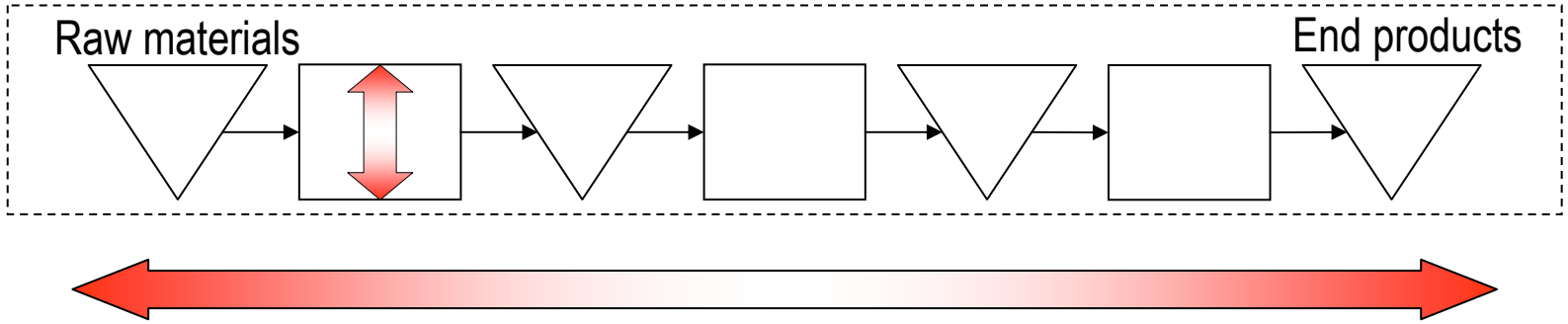

’60/’70 1980 1990 2000

- Supply chain is a creature who evolved in time
  - Each decade is characterized by different values of **drivers** and thus different **supply chain configurations**
  - Not each step is mandatory

1. Supply chain in the 60s/70s

Resources: Availability of production factors
Saturation: Demand >> Capacity
Standardization: Standard demand
Supply: No specialized suppliers
Transaction Costs: Low

Total vertical integration
Big departments
Everything in the same place: no need for ICT
Emphasis on Making
Integration through ownership
Low globalization
Few client/supplier interfaces



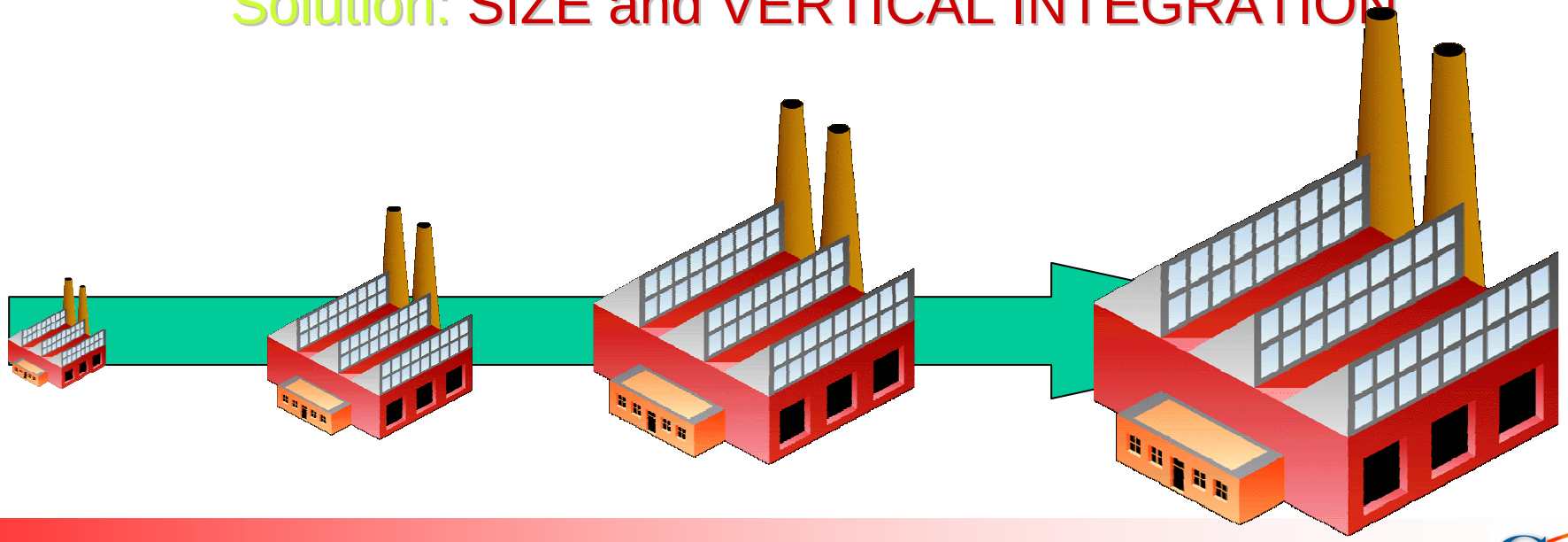
- Which was the context in the 60s?

1. Supply chain in the 60s/70s

"Industrial model" till the end of the '60

Problem: Growth of volume in order to match a SPARKLING DEMAND

Solution: SIZE and VERTICAL INTEGRATION



1. Supply chain in the 60s/70s

"Industrial model" till the end of the '60

Evaluation criteria: REVENUES and CONSUMPTION of PRODUCTION FACTORS; "installed power"

Service / Quality: "marginal": the most important to do is to MAKE AVAILABLE a PRODUCT

1. Supply chain in the 60s/70s

- “Pressures” on industrial firms (since the end of ’60s)

Growing COMPETITION

It is not enough that you “produce”: you must “SELL”

INDUSTRIAL COSTS control

Oil crisis: raw materials and energy out of control

OVERCAPACITY (in some industries)

Looking for economies of experience

Growing of CONFLICTS in INDUSTRIAL RELATIONS

1. Supply chain in the 60s/70s

- "Pressures" on industrial firms (since the end of '60s)

Need to compete
using the level of price
to maintain or to gain market share

FACTORIES MUST CONTAIN COSTS :
BE EFFICIENT

The costs of production factors follow
EXOGENOUS dynamics

Looking for elements of INDUSTRIAL DIFFERENTIATION

1. Supply chain in the 60s/70s

The ANSWERS:

DECENTRALIZATION and
DEVERTICALIZATION

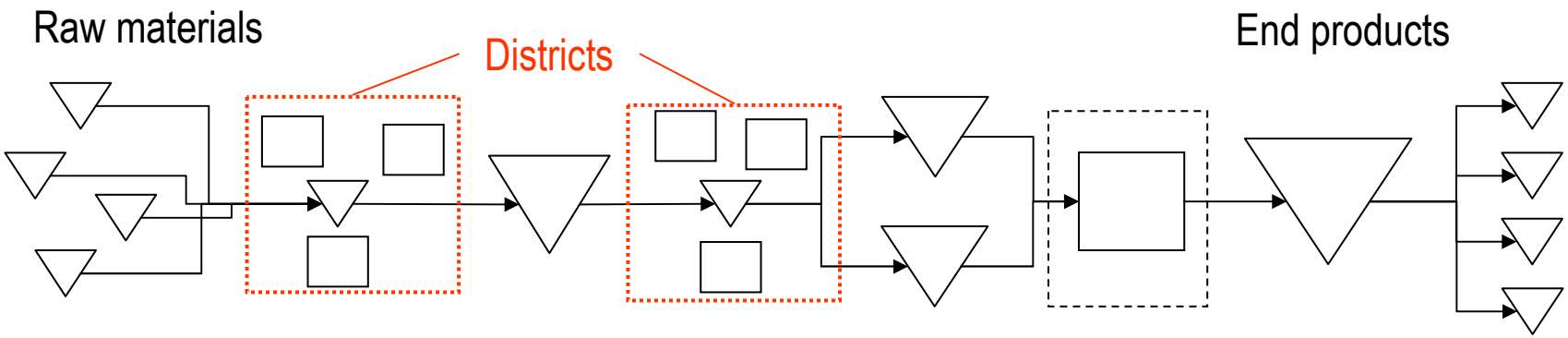
HIGH INDUSTRIAL
AUTOMATIZATION

CONCENTRATION
at CORPORATE LEVEL

2. Supply chain in the 80s

Resources: Growing costs of production factors
Saturation: Demand << Capacity
Standardization: Less standard demand
Supply: Small and close specialized suppliers
Transaction Costs: Low

Vertical disintegration
Production decentralization
Flexible specialization
Districts
Widespread know-how
Third party work (Italy: ’“indotto”)



- Crisis of the big integrated firm
- Focus on know-how transfer, cost reduction, flexibility
- Different paths. Ex: Marelli (growth), Benetton (born disintegrated)

2. Supply chain in the 80s

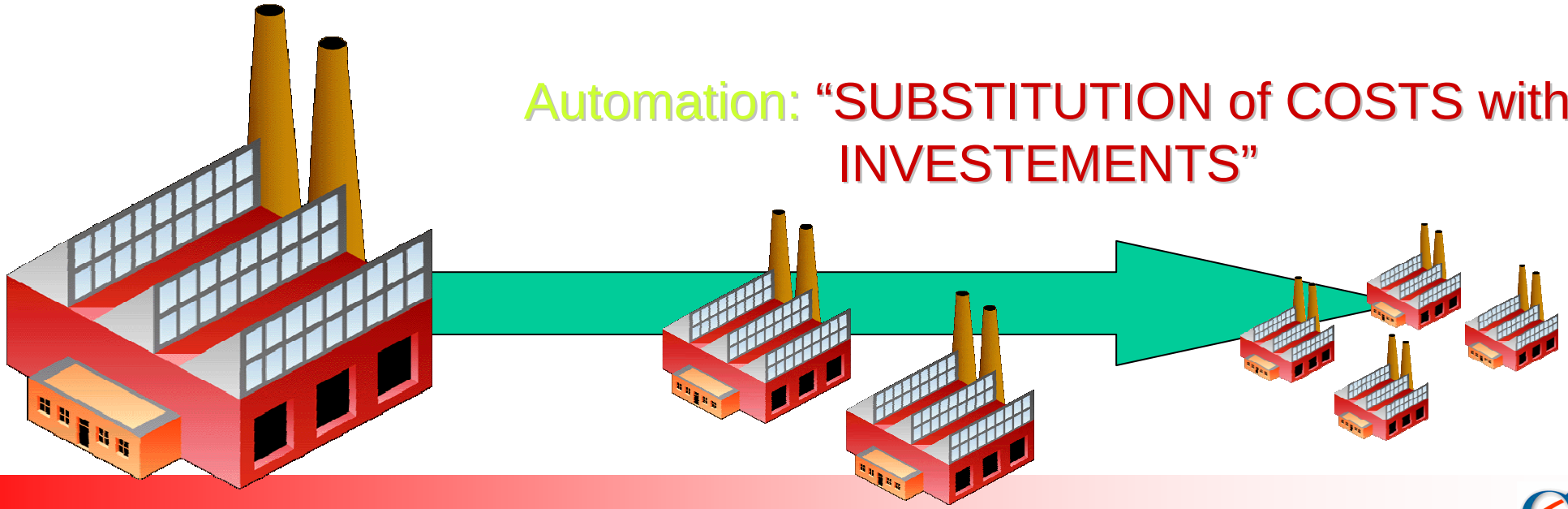
Industrial model in the ‘70s

Make or buy: Outsourcing: VALUE ADDED TRANSFER… ...

Management resources are freed: they will be focused on “critical” technologies …

… possibility to have specialized suppliers

Automation: “SUBSTITUTION of COSTS with INVESTEMENTS”



2. Supply chain in the 80s

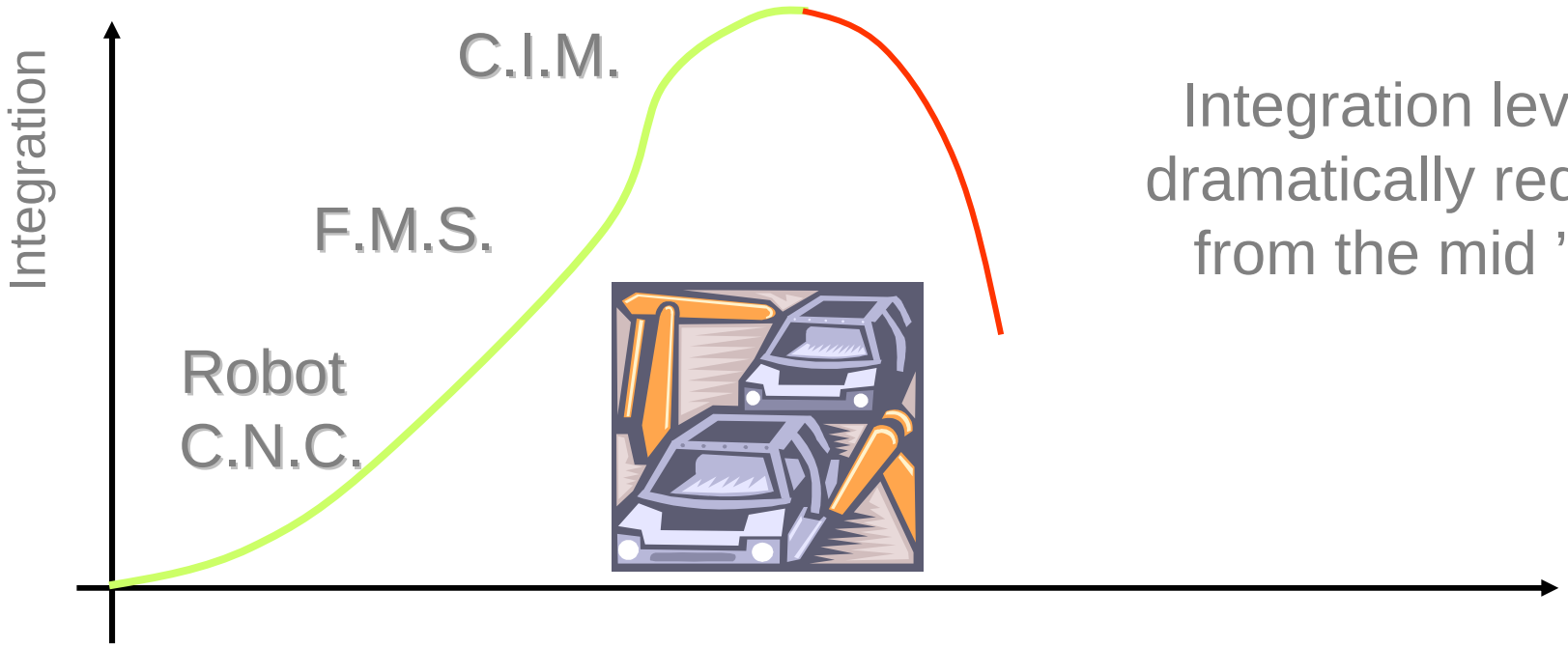
Industrial model in the ‘70s

Evaluation criteria: STILL ORIENTED TO COST REDUCTION…

Service / Quality: still “residual”: what is important is that PRODUCT COST IS LOW

2. Supply chain in the 80s

In the industrial model of the ’70s AUTOMATION is more and more INTEGRATED

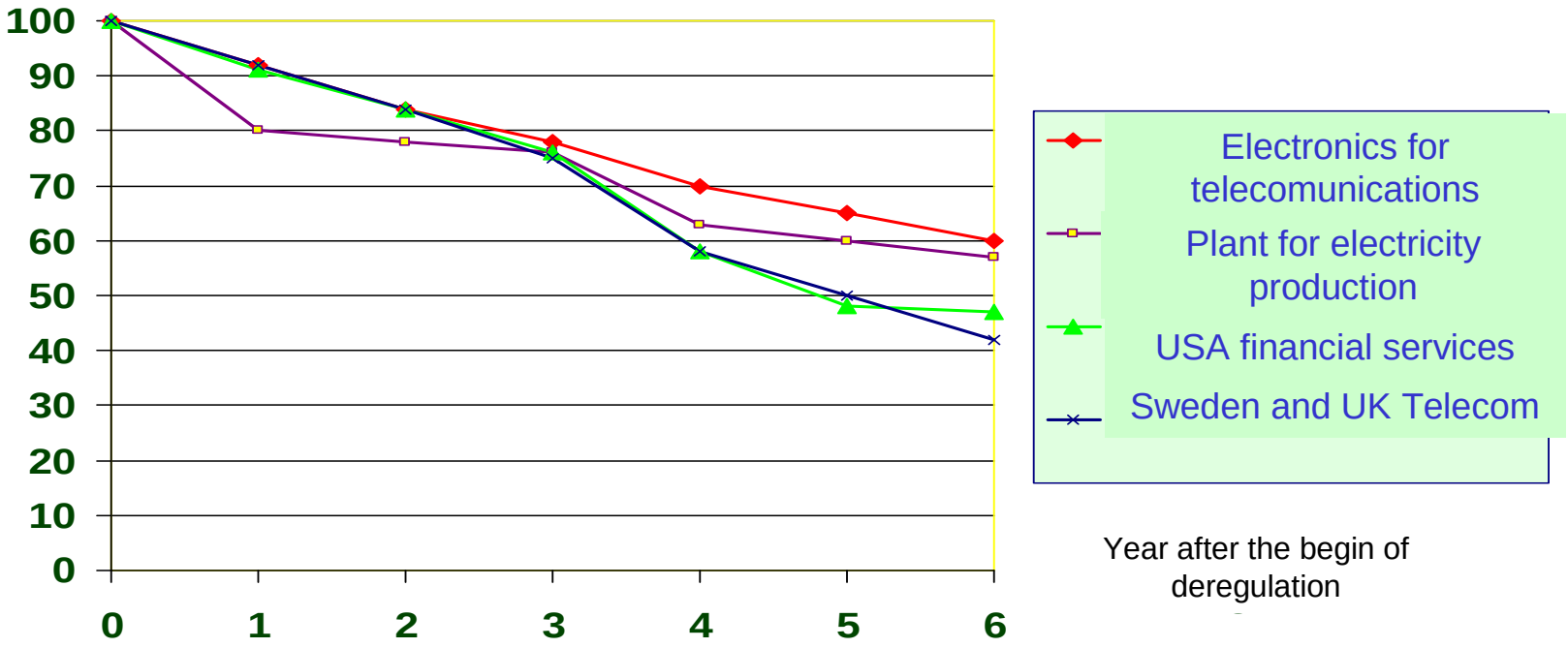


Integration level is dramatically reduced from the mid ’80s

2. Supply chain in the 80s

- The fall of prices is structural

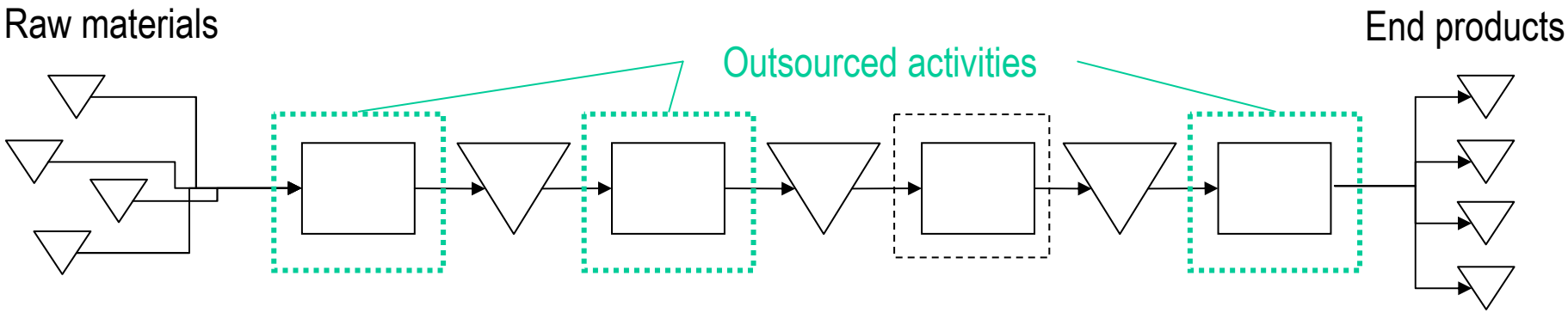
(fonte: 3° CEO Conference in Italy, Mc Kinsey & Mondo Economico)



3. Supply chain in the 90s

Resources: Access to global production factors
Saturation: Demand << Capacity
Standardization: Wide range of needs
Supply: Highly specialized suppliers
Transaction Costs: Variable

No more districts
Many specialized (and big) suppliers around the world
Globalization
ICTs support
Coordination mechanisms
Supply chain management



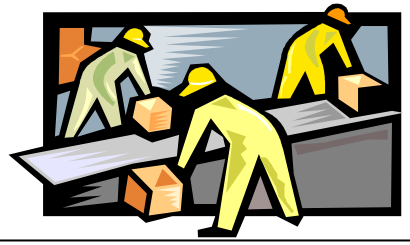
- Crisis of industrial districts
- Outsourcing and offshoring to Romania, Czech Republic, China,…

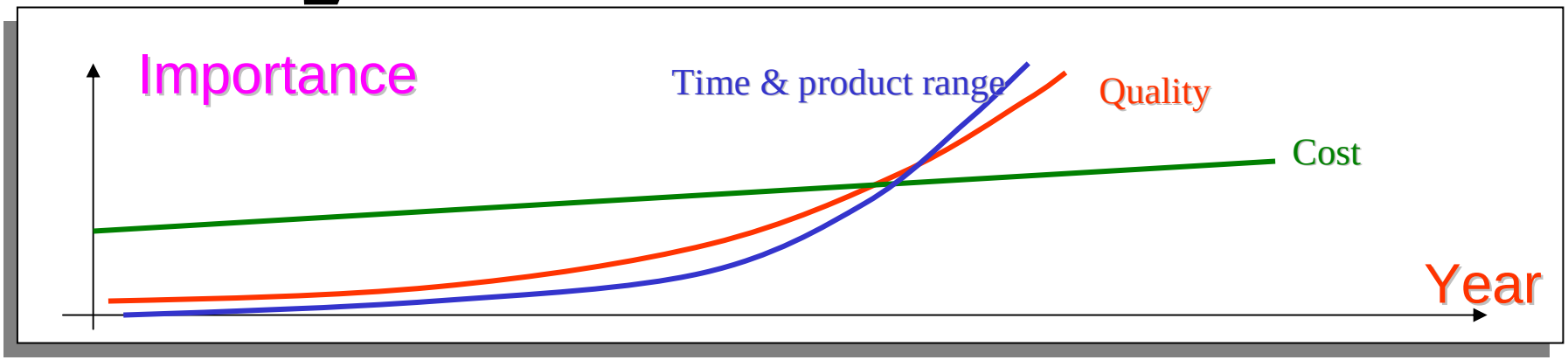
3. Supply chain in the 90s

Since the beginning of the second half of the ’80s the relative importance of the “competitve variables” has changed significantly ….

…from INTERNAL EFFICIENCY…

… to EFFECTIVENESS EXTERNAL to the firm

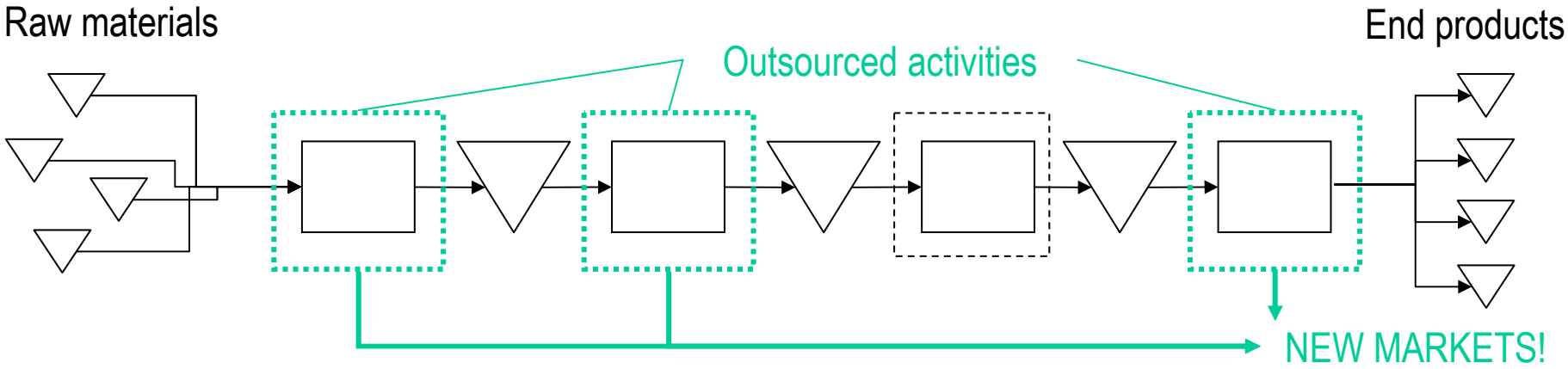




4. Supply chain in 2000

Resources: Access to global production factors
Saturation: Demand >> Capacity
Standardization: Wide range of needs
Supply: Highly specialized suppliers
Transaction Costs: Variable

No more districts
Many specialized (and big) suppliers around the world
Globalization
ICTs support
Coordination mechanisms
Supply chain management

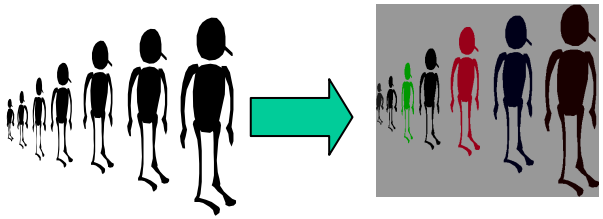


- Discovering of new markets: once again D>C
- There are some differences with Stage 1:
  - technological skills
  - innovation
  - focus: not only cost reduction
  - lean supply chain

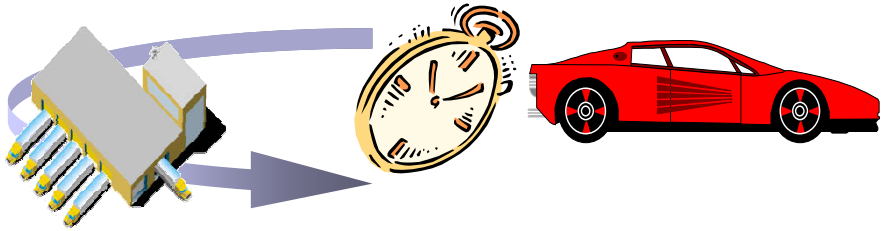
4. Supply chain in 2000

The industrial model since the ’90s has been affected by :

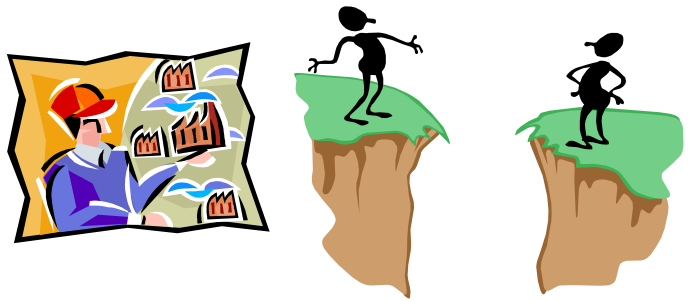
Exploding growth rates of mix
&
mass customization issues



Critical acceleration of the speed of every process (“e-” rate)

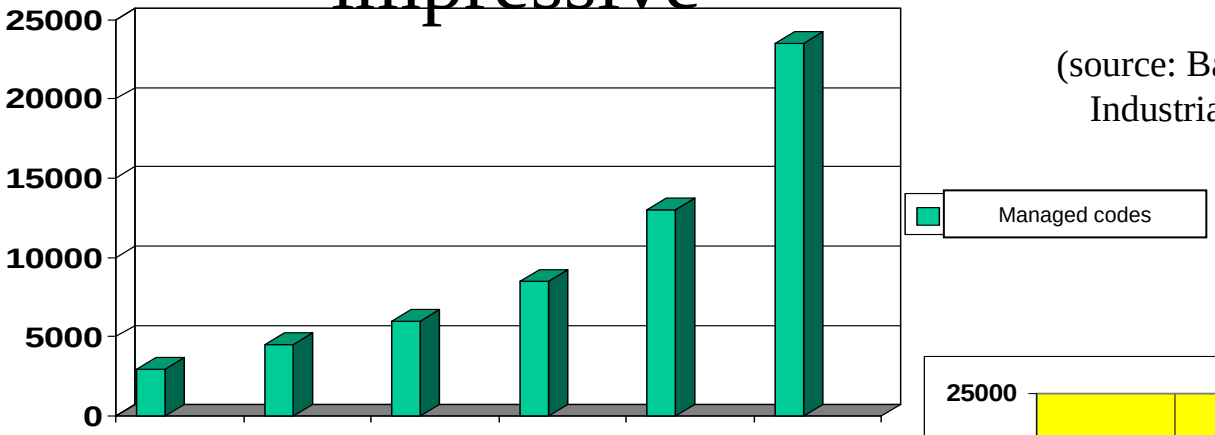


Internationalization, globalization of delivery & supply markets and of manufacturing facilities

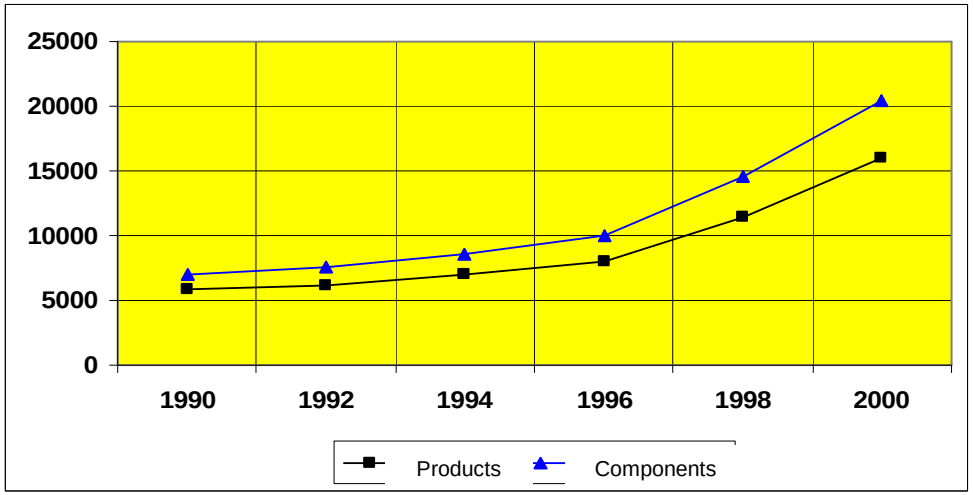


4. Supply chain in 2000

- Product range growing derivatives are impressive

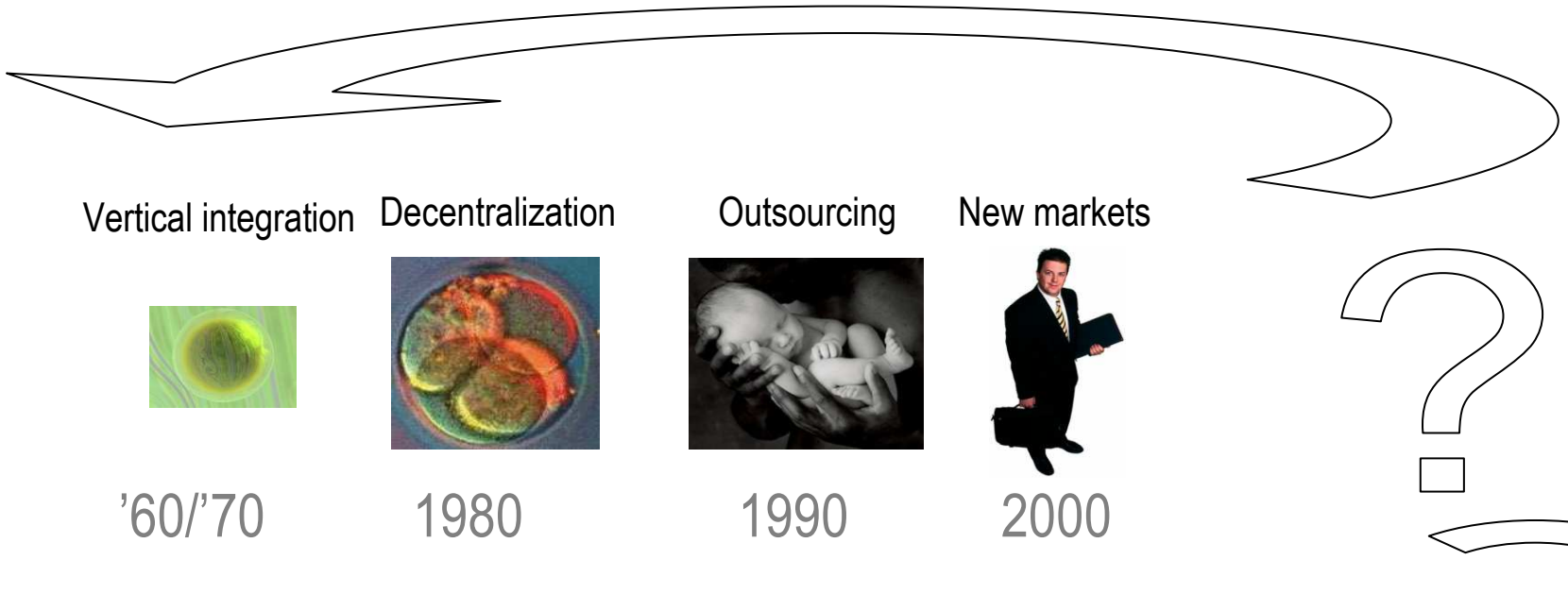


(source: Bain Cuneo, analysis of Industrial Goods Producers)



(source: data of a firm in the electrmechanical sector)

What's next?



- Today's developing countries reflect Stage 1
  - Departments are even bigger! Ex: Johnson
  - Is the cycle going to start again…

…or a new solution will emerge?

The dilemma

How to match the challenges of effectiveness (Time, Quality, Range) with the needs of efficiency?

The dilemma

The prevailing idea since the end of the ‘90s is that:

It is not allowed not be efficient (cost reduction)

However with respect to the previous scenarios cost reduction is not “enough by itself”...

...but it becomes an industrial objective that can not be procrastinated as it is the means to release resources to be more effective (better SERVICE, better QUALITY)

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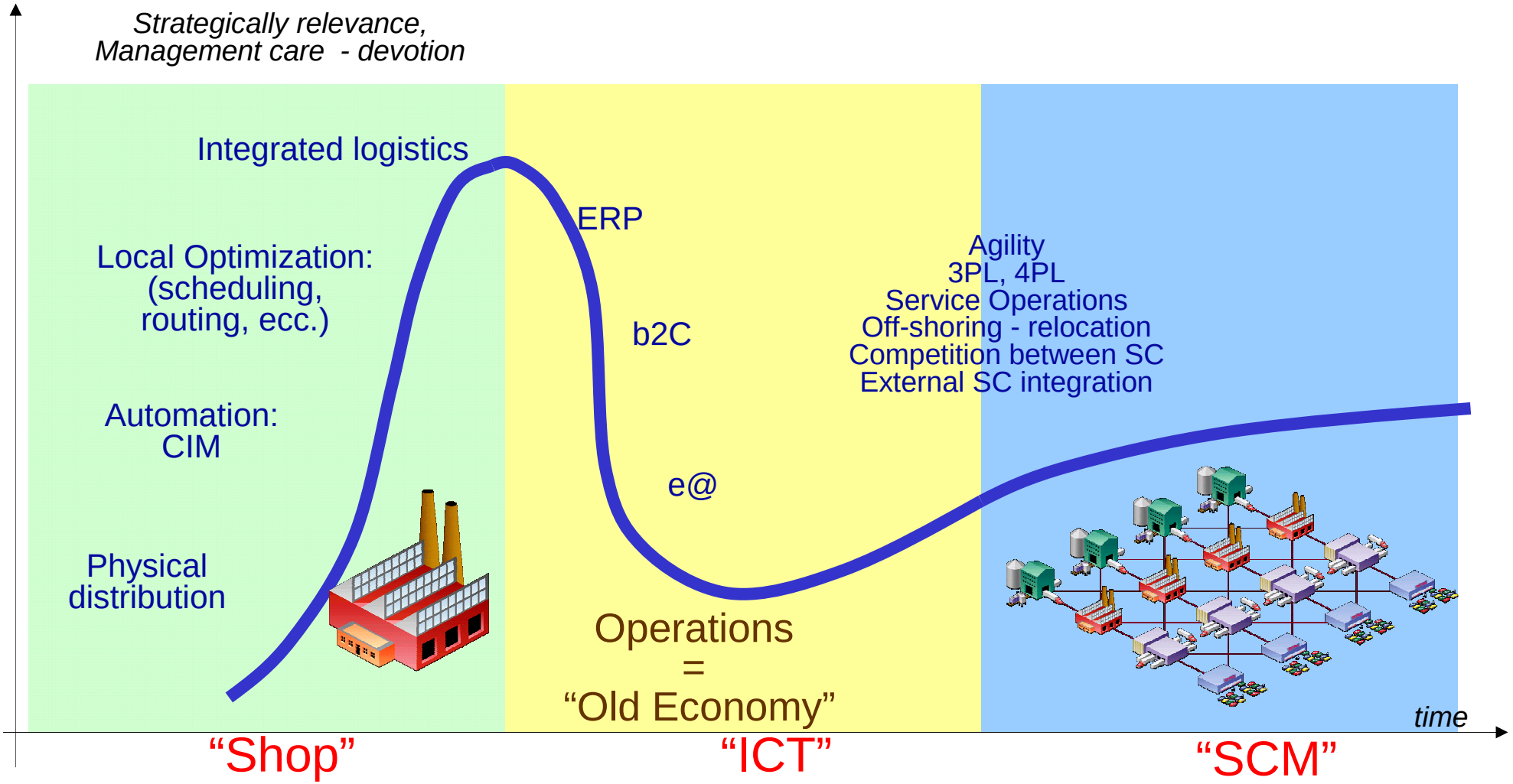
SCM: slogan or fortune ?



emerging trends & responding practices