
BUSI4496

Supply Chain Planning & Management

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Operations Management
and Information Systems

Lecture 1

SELF STUDY



04.10.2024

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Outline

1. What is a supply chain?
2. Module aims and objectives, outline
 1. Module outline
 2. Teaching methods and assessment
 3. Group assignment
3. Classification of operational systems
4. Learning points - summary
- Pre-Recorded Self-Study Session on Moodle**
5. The Customer Order Decoupling Point (CODP)
6. Contemporary Supply Chains – Digitalisation of Supply Chains
7. Review questions and the examination

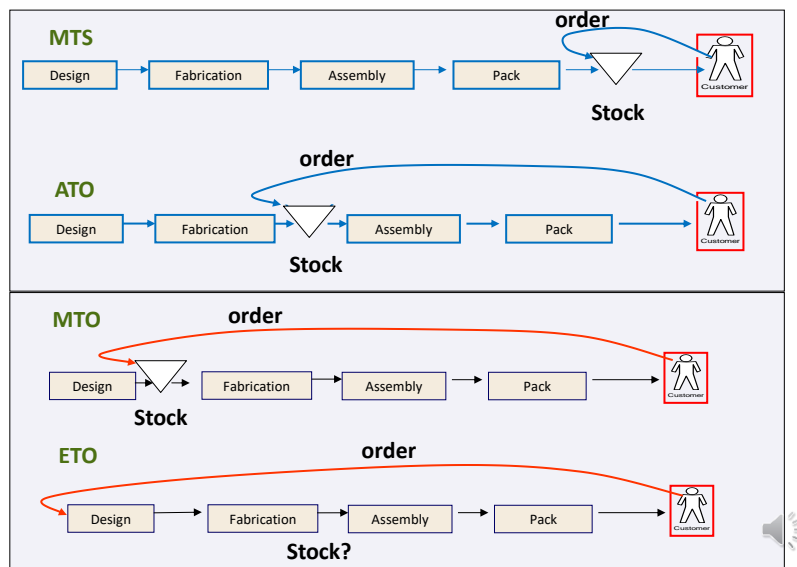
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5. The Customer Order Decoupling Point



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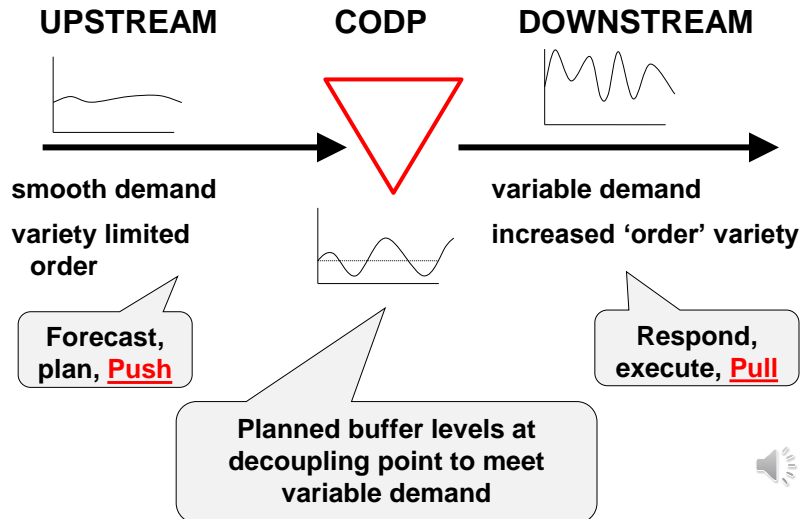
MTS/ATO/MTO/ETO where does the customer order enter the system?



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Customer order decoupling point (CODP)

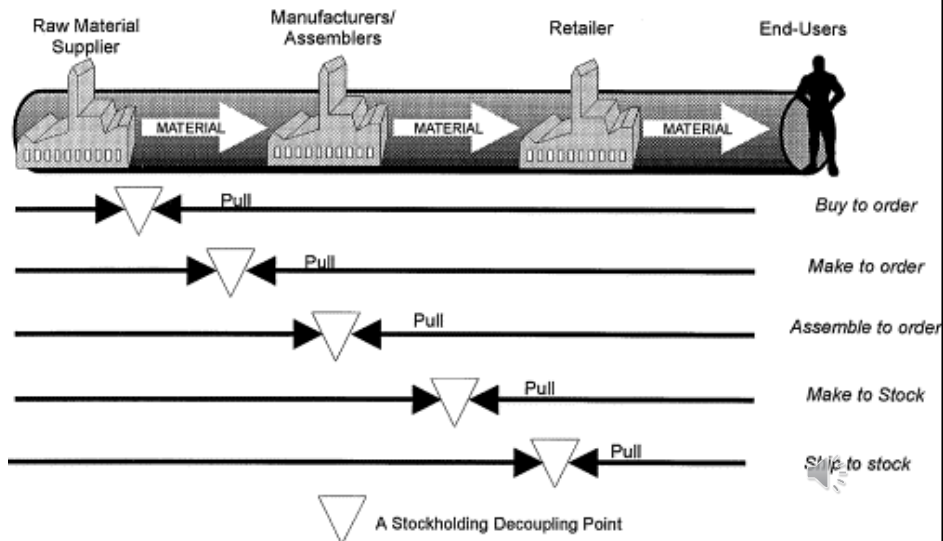
The customer order decoupling point (CODP) is the point at which a specific customer order enters the system



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Applies to the Supply Chain



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Where should the decoupling point be?

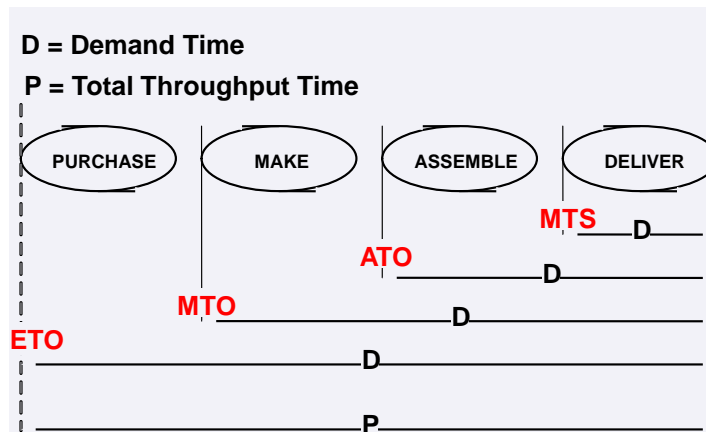
Do you have a choice?

It depends – the position of the decoupling point is affected by:

- Technological factors
- Financial factors - stock holding and stockout costs
- Obsolescence risks – how accurate are the demand forecasts?
- The longest lead time that a customer is prepared to wait
- What competitors do!
- Producers and manufacturers may use different decoupling points for different products



Where should the decoupling point be?



- If total production lead time P is high compared to the time a customer is prepared to wait for delivery, D, then the manufacturer is forced to move towards making to stock. When the P and D are approximately equal, then the manufacturer may be able to make to order. Wikner & Rudberg (2005)



Classification of operational systems - summary

- **These concepts apply across the supply chain**
- **All are approximations - many hybrids, many links**
 - mixture of flow and job shops, mixture of MTO/ATO and MTS
 - different product groups in the same facility with different policies
 - MTS often associated with repetitive line production
 - May vary over product lifecycle
- **Specific kinds of configurations may be preferred**
 - Rapid response strategy – MTS; pure customised products – job shop /functional layout etc.
 - Market and competitive pressures may challenge the existing process configuration and how it is managed
 - Flows shops are easier to plan, manage and control
- **The Decoupling Point**
 - where a specific customer order enters the system – is an important concept in the design of production systems and supply chains

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6. Contemporary Supply Chains –

The Digitalisation of Supply Chain

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Supply Chains – previously

- Make anything, anywhere
- Seamless, optimised, lean, just-in-time
- The earth is flat – operationally



Dynamic Flows
– Materials
– Information
– People/politics?
And then.....



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Since 2016



A risky operational world

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Supply chains in the Spotlight

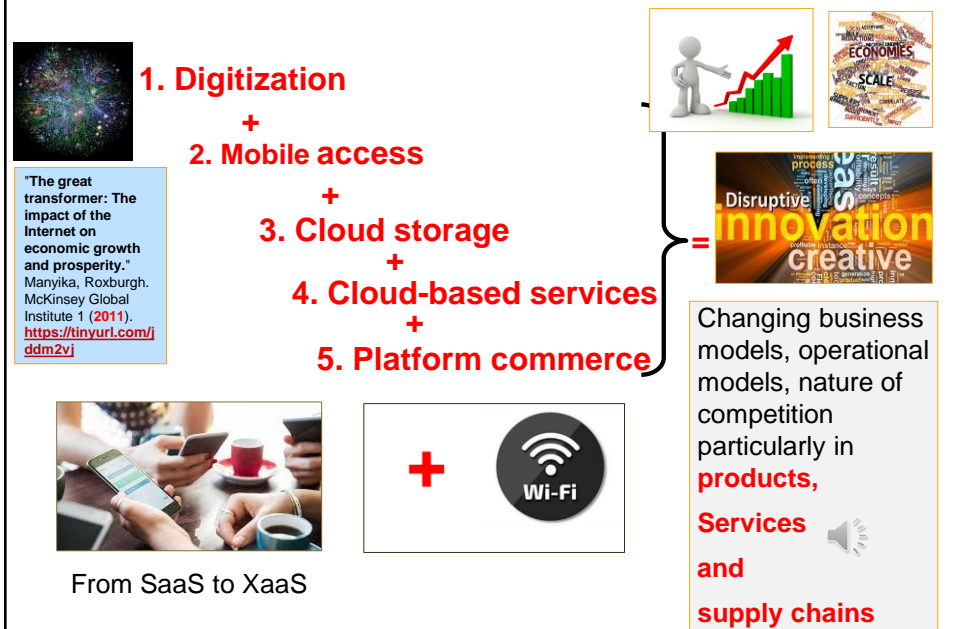


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The digital revolution



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7. Review questions and the examination



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Assessment

Type	Weight	Length	Assessed In
In Person Exam	65%	2 hours	January
Coursework	35%	3500 words	Autumn

■ Examination:

Three sections in the exam A, B, C

- Each section is equally weighted
- **Section A** – 4 compulsory short questions (2 quantitative, 2 descriptive)
- **Section B** – two longer quantitative questions (do 1)
- **Section C** – two longer descriptive/essay questions (do 1)
- We will give you **full details of what we expect** as we teach the module and in the review



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Review questions

- For sessions 1, 2, 3, 8, 9, 10, there will be review questions
- For sessions 4, 5, 6, 7 questions will be handed out in the seminar sessions
- These questions will get you to think about the **concepts** and **methods** covered in the lectures and should help you to **revise and consolidate** the material
- Get in touch with us if you have any queries about any aspect of the module such as a review question or a worked numerical example or raise it in a seminar session
- Note – these questions are **comprehensive but not exhaustive**.



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Lecture 1 Review Questions

These questions and answers should help you to think about, revise and consolidate the material covered in the lecture.

- 1. A typical supply chain has a feed forward flow of material and a feedback flow of information. Explain why this is the case.**
- 2. Some supply chains are very complex involving many companies, others are simpler. Give examples of each and explain what the planning challenges might be in each case.**
- 3. Some supply chains are mature and slow to change whilst others are new and still evolving. Give some examples of each.**
- 4. Why does Apple need effective supply chain planning and management? .**



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5. Provide a definition for supply chain management and give some reasons why it is often very challenging for companies to manage their supply chain successfully.

6. What is a flow shop? Why are flow shops often preferred in production operations?

7. What is the difference between a Make-to-Order (MTO) system and a Make-to-Stock (MTS) system and when might each approach be applied to meet demand?

8. What is the Customer Order Decoupling Point (CODP) and how does its location change in different kinds of production systems and supply chains?



Q7. Sample answer

The primary difference between MTO and MTS is the position in the operational system from where a customer order is satisfied.

In an MTS system a customer order is satisfied from finished stock. In an MTO system production is not started until a customer order is received. Although this is a simple idea to grasp, it has many implications.

There are advantages and disadvantages to each approach. The primary advantage of an MTS approach is that it enables rapid response to customer demand – the product is already made. However, MTS relies on accurate forecasting of what customers will purchase. The primary advantage of MTO is that it avoids holding stock of finished products that may not sell. However, the customer has to wait for the product to be produced. MTO systems hold stock of raw materials only.



Q7. Sample answer continued

Typically, MTS is used for fast-moving, high-volume consumer products, e.g. simpler products of relatively low value, such as grocery food products. Also, many common high-volume engineering products are made to stock e.g. screws. There is less risk of products not selling than would be the case for more complex products.

MTO is typically used for slower moving, more complex and specialised products with lower volume and higher value, (e.g. industrial machinery products. Aircraft are made to order as are aero-engines. The customer is often prepared to wait for these products to be produced.

There are other production approaches. Assemble-to-Order (ATO) lies somewhere between MTS and MTO. Engineer-to-Order (ETO) is a form of MTO where the customer also specifies or is involved in designing the product, which is then made to order. Note that some companies may use a combination of these approaches for different products.

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**Now try one of the questions for
yourself**



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References

- MacCarthy, B. L., & Ivanov, D. (2022). The Digital Supply Chain—emergence, concepts, definitions, and technologies. In *The Digital Supply Chain* (pp. 3-24). Elsevier
- MacCarthy, B. L., & Jayarathne, P. G. S. A. (2013). Supply network structures in the international clothing industry: differences across retailer types. *International Journal of Operations & Production Management*, 33(7), 858-886.
- MacCarthy, B. L., Blome, C., Olhager, J., Srai, J. S., & Zhao, X. (2016). Supply chain evolution—theory, concepts and science. *International Journal of Operations & Production Management*, 36(12), 1696-1718.
- Olhager, J. (2010). The role of the customer order decoupling point in production and supply chain management. *Computers in industry*, 61(9), 863-868.
- Stevens, J.(1989). Integrating the supply chain, *International Journal of Physical Distribution and materials Management*, 19 (8), 3-8.
- Wikner, J., & Rudberg, M. (2005). Integrating production and engineering perspectives on the customer order decoupling point. *International Journal of Operations & Production Management*, 25(7), 623-641.

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