

NATIONAL UNIVERSITY OF SINGAPORE
School of Business

DOS3701 Supply Chain Management

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Course Objectives

Interest in supply chain management, both in industry and in academia, has grown rapidly over the past three decades, and continues to grow. A number of forces have contributed to this trend. In the 90s, many companies realized that they have reduced manufacturing costs as much as practically possible. In the same time, many of these companies found that substantial savings can be achieved by planning and managing their supply chains more effectively. In addition to new logistics strategies being implemented, information and communication systems were also widely implemented, and provide access to comprehensive data from all components of the supply chain. In particular, the influence of the Internet and e-commerce on the economy in general and business practice has been tremendous. For example, the direct business model employed by several industry giants enables customers to order products over the Internet and thus allows companies to sell their products without relying on third-party distributors or conventional stores. Similarly, the Internet has made a significant impact on business-to-business transactions and collaborations. In recent years, as offshoring and globalization of manufacturing operations continue to grow, supply chain complexity and risks have significantly increased. This, together with fluctuating energy costs and the acceleration of merger and acquisition activities, has motivated many companies to reevaluate their supply chain strategies in order to better utilize existing resources and infrastructure. Furthermore, COVID-19 has imposed great challenges in ensuring supply chain resilience globally and governments must stabilize supply chains and thoughtfully expand social safety nets now to avert social unrest.

It is thus not surprising that many companies and governments are involved in the analysis of their supply chains. In most cases, however, this analysis is performed based on experience and intuition using very few analytical models or planning tools. In contrast, in the last three decades, the academic community has developed various models and tools for supply chain management. Unfortunately, the first generation of this technology was not robust or flexible enough to allow industry to use it effectively. This, however, has changed in recent years, during which improved analysis and insight as well as effective models and decision-support systems have been developed. However, many companies are not aware of these new developments yet.

In this course, we intend to fill this gap by discussing state-of-the-art models, concepts, and solution methods that are important for the design, control, operation, and management of

supply chain systems. In particular, we will assume the knowledge of basic topics in inventory management, which was taught in DSC2006/DAO2703 Ops and Technology Management, and focus our discussions on the more advanced topics such as supply chain coordination and how to design supply contracts to coordinate the supply chain, value of information in the supply chain, supply chain integration, product design and the interface between product design and supply chain strategies, revenue management, risk management, and latest issues in supply chain management.

Main Text:

- Designing and Managing the Supply Chain: Concepts Strategies and Case Studies, Simchi-Levi, Kaminsky and Simchi-Levi, 2008, 3e, Irwin/McGraw-Hill.

Reference Text

Additional readings will be given throughout the semester. In addition, the following four textbooks are recommended references even though they are not required for the course. The first book is another popular textbook for the SCM course. The next two books are for those who want to build mathematical models of the issues/phenomena in supply chains. The last book is to supplement the existing books with the latest supply chain management issues.

- Sunil Chopra and Peter Meindl, "Supply Chain Management: Strategy, Planning, and Operation (6th Edition)", Pearson, 2016.
- The Logic of Logistics: Theory, Algorithms and Applications for Logistics Management, by D. Simchi-Levi, X. Chen, and J. Bramel, 3e (2016).
- Handbook of Quantitative Supply Chain Analysis: Modeling in the E-Business Era, 2004 Kluwer Academic Publishers. David Simchi-Levi, S. David Wu, and Z. Max Shen (Eds.).
- Global Supply Chains in a Glocal World - The Impact of Covid-19 and Digitalisation, edited by Puay Guan Goh and Mabel C. Chou, 2022, World Scientific Publishing Company.

Prerequisites

Knowledge of basic calculus, elementary probability and the Normal Distribution.

Connection to Other Courses

This course builds on DSC2006/DAO2703 Ops and Technology Management, is companion to DOS3702 Purchasing & Materials Management, DOS3703 Service Operations Management, DOS3712 Physical Distribution Management, and prepares for continuation into DOS4761 Seminars in Ops & Supply Chain Management and Field Service Projects.

Evaluation

Group Homework	40%
Individual Homework	50%
Class Participation	10%

ACADEMIC HONESTY & PLAGIARISM

Academic integrity and honesty is essential for the pursuit and acquisition of knowledge. The University and School expect every student to uphold academic integrity & honesty at all times. Academic dishonesty is any misrepresentation with the intent to deceive, or failure to acknowledge the source, or falsification of information, or inaccuracy of statements, or cheating at examinations/tests, or inappropriate use of resources.

Plagiarism is 'the practice of taking someone else's work or ideas and passing them off as one's own' (The New Oxford Dictionary of English). The University and School will not condone plagiarism. Students should adopt this rule - You have the obligation to make clear to the assessor which is your own work, and which is the work of others. Otherwise, your assessor is entitled to assume that everything being presented for assessment is being presented as entirely your own work. This is a minimum standard. **In case of any doubts, you should consult your instructor.**

Additional guidance is available at:

<http://www.nus.edu.sg/registrar/adminpolicy/acceptance.html#NUSCodeofStudentConduct>

Online Module on Plagiarism:

<http://emodule.nus.edu.sg/ac/>

PROFILE OF INSTRUCTOR

Mabel Chou Cheng-Feng is an associate professor in the Analytics and Operations department at National University of Singapore (NUS). She received the B.Sc. degree in mathematics from National Taiwan University, the M.Sc. degree in mathematics and Ph.D. degree in industrial engineering and management sciences from Northwestern University. Her research focuses on production scheduling and supply chain analysis. She has published papers for journals such as Operations Research, Management Science, IEEE Transactions on Automatic Control, Math Programming, Production and Operations Management, European Journal of Operational Research, Flexible Services and Manufacturing Journal, etc. Her current research interest is in the application of optimization tools and business analytics for engineering, service, and supply chain management problems. She is an associate editor for Operations Research, a senior editor for Production and Operations Management and an associate editor for Pacific Journal of Optimization. She has also consulted for companies such as GSK, Caterpillar, P&G, SIA Engineering Company, National University Hospital, Tan Tock Seng Hospital, Lenovo, Supreme Components International, etc. and conducted courses for 3M, the Logistics Institute – Asia Pacific, and the Singapore Institute of Manufacturing Technology.

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