SCM.294. Digital Supply Chain Transformation
Spring 2020

Details

Meets: Thursdays 4-7pm, from April 2 - May 7, 2020
Classroom: E51.335
Units: 2-0-4
Graded: Letter A-F
Office Hours: TBD

Instructor:
Dr. Maria Jesus Saenz (mjsaenz@mit.edu)
Director, MIT Digital Supply Chain Transformation

Office location: 1 Amherst Street Bldg E40-367 (3rd floor)

Teaching Assistant: TBD

Justification for the creation of this course

Digitalization is revolutionizing many industries, one field of exceptional transformation is supply chain. Across the globe, industries have changed rapidly due to multiple factors: customer-centric strategies, supply chain expectations on delivery and customization, and many others. Final consumers learn and engage with brands and their partners. Managing suppliers upstream is also changing quickly. Supply chain actors’ expectations are increasing, their experience is becoming more prevalent, and they continue to open doors for new digital offerings.

This course allows the students to learn in creating digital supply chain strategies and in experimenting with the key digital supply chain capabilities, for further implementation and transformation in their dynamic value chains at work. This course will contribute to the portfolio of electives at MIT, adding the perspective of supply chain and their actors, as well as integrating the different areas of operations together with the transformative approach.

Course Description

Analyzes the factors involved in the digital transformation of supply chain relationships. Develops an in-depth understanding of the perspectives, roles, and decisions of relevant stakeholders in transforming supply chains in the digital era. Covers digital supply chain capabilities, the role of
technology, processes and organizations, as well as digital platforms and performance. Discusses relevant case studies of digitally transformed supply chains, covering topics of long-term competitive advantage through operations and digital enhanced value generation. Includes presentations, guest executive speakers, team projects and case discussions, under experiential learning complementary approaches.

Objectives

The four primary objectives of this course are:

1. Develop experience in creating a digital supply chain strategy
2. Identify and learn how to implement the key digital supply chain capabilities
3. Practice with End-to-End data governance and supply chain performance
4. Understand the balance between technology, processes and organizations

Grading

This course is graded along four primary components:

- **Graded Assignments** (30%): Primarily individual exercises but also team based, with one assigned for each major lecture topic. Performed during or outside of class time. Instructions for each assignment will be provided in class. Each assignment will be delivered via Learning Module. Assignments associated to case studies require that the student will answer the case questions individually and submit their short reports (1-2 pages) before the session in which the case will be discussed.

- **Quizzes** (15%): At the end of some lecture topics, students will answer quick quizzes with the main goal of assessing the key concepts of the class.

- **Class Participation** (20%): Students are expected to actively contribute to class discussions. Most sessions will be based on cases, and all of them will require discussion, that will be graded accordingly to the value added by the student to the learning process of the class.

- **Final Project** (35%): The course project will require students by teams to apply and integrate the different concepts and practices learned in class along the course. See Final Project description below.

Course Schedule

Classes are taught for 1.5 hours sessions, twice a week. In this course, we will cover particularly these key topics:

**Week 1. What do we mean by Digital Supply Chain Transformation?**

**Session 1. Overview of the Course. Introduction to concepts.**
Instructor: Dr. Maria Jesus Saenz
Session 2. Digitizing vs Digitalizing in Supply Chains.
Instructor: Dr. Maria Jesus Saenz

Recommended readings for this session:

Assignment Due: Select final project topic, scope and team partners. See Final Project description below.

Week 2. Digital SC Transformation Capabilities

Session 1. eCommerce Transformation and Omnichannel Revolution.
Adidas Russia Case Study.
Guest Speaker: Dr. Eva Ponce. Executive Director MITx MicroMasters in SCM. MIT CTL

Required readings for this session (*only recommended):
• Adidas Russia / CIS and the Russian crisis: retrench or double down – Case Study.

Session 2. Dealing with Supply Chain Complexity and Risks in the Digital Era.
Cisco Systems, Inc. Case Study.
Instructor: Dr. Maria Jesus Saenz

Required readings for this session (*only recommended):

Graded Assignment: Case study reports individually before the sessions.

Week 3. The role of Technology and its applications to Digital Supply Chains

Session 1. Achieving End-to-End Visibility: Blockchain and IoT, applications to Supply Chains.
Guest Speaker: Dr. Inma Borrella. Research Scientist, MIT CTL.

Required readings for this session:

Session 2. Harmonization, Visualization and Data Governance.
Week 4. Digital Platforms and Performance

Session 1. Multidimensional Collaboration and Performance, Collaborators Singers Game
Instructor: Dr. Maria Jesus Saenz

Session 2. Crowdsourcing in Last Mile Delivery. Working in teams
Instructor: Dr. Maria Jesus Saenz

Required readings for this week (*only recommended):
- Saenz, M.J. The Physical Internet: Logistics Reimagined?. Supply Chain Management Review. 23 March 2016.*

Graded Assignment: Proposal for a Collaborative Platform. Instructions will be delivered in Session 2 and will be done in teams during the class.

Week 5. Digital SC Transformation Roadmap

Session 1. Digital SC Transformation Journey. Operational and Organizational Challenges
Digital Supply Chain Transformation at Dell
Guest Speaker: Andre Soldo, VP, Global Operation Strategy at Dell (tentative).

Required readings for this session (*only recommended):
- Case Study Digital Supply Chain Transformation at Dell, Forthcoming 2020.

Session 2. Industry 4.0 and Digital Transformation
TetraPak Case study. A digitally enabled supply chain as a competitive advantage (IDM960)
Instructor: Dr. Maria Jesus Saenz

Required readings for this session (*only recommended):

Graded Assignment: Case study reports individually before the sessions.

Week 6. Advanced Applications

Session 1. Artificial Intelligence Driven SCs: Challenges and Opportunities
Instructor: Dr. Maria Jesus Saenz

Required readings for this session (*only recommended):

Session 2. Final Project presentations by the teams of students. Wrap Up and Final Discussions.
Instructor: Dr. Maria Jesus Saenz

Graded Assignment: Final Project report and presentation by teams. See Final Project description below.

Prerequisites

Graduate level courses in operations management, logistics design and/or supply chain management preferred.

Final Projects

The final projects will be done in teams of 4 (exceptionally 3) students.

The main goal of these projects is to apply the main concepts and practices learned along this course, together with previous experience of the students, as well as additional insights extracted from current research.

Each team will work on the analysis of the digital supply chain concepts worked in the course, applied to a particular industry/sector/area. The analysis might include the following: description of the company’s and its supply chains, current and future (digital) business model, challenges, opportunities, potential digital transformation developments, and the future (5-10 years) you envision for this industry. You can base your analysis in one particular company within this industry, known or not known by you; you can develop a benchmark of the industry/sector; or you can select one portion of a supply chain of this industry that is relevant for proposing new insights around digital transformation. You can also propose a pilot study.

Each team must notify the chosen team, approach and expected scope (1 page) for their project by the first session of Week 2. Each group will deliver a 10-15-page critical analysis paper as well as short Power Point presentation to the class in the last session, including a discussion section with the rest of the class. All projects will be made public for the class to share.

The assignment of industry/sector to each group is the following:
Group A: Pharma SC  
Group B: Retail SC  
Group C: Food SC  
Group D: Electronics SC  
Group E: Chemical SC  
Group F: Apparel SC  
Group G: Automobile SC  
Group H: Logistics Service Providers  
Group I: Role of Start ups in DT  
Others: In case that more projects are needed, the instructor will provide instructions about the final allocation.