Digital Transformation

Description

Are we living a fourth industrial revolution, or a fifth technology innovation wave? Regardless of the semantic and timing debate, we are living in a world driven by digital technologies. And unlike previous technology-driven major society shifts, the current wave of innovation has the potential to fundamentally change the way individuals behave, companies and whole industries operate and, some believe, the nature of work itself. Furthermore, major changes occurring at the same time, including but not limited to climate change, globalization of the economy, emerging economic models, to name just a few; raise the fundamental question on how digital technologies will help modify – for the better - the way we live, work, and think; in our increasingly interconnected and interdependent world.

Fortunately, lessons learned from past technology evolutions help us get a better understanding of modern trends. Furthermore, time-dependency analysis of technology adoption helps us further refine our knowledge on the way we should, collectively, embrace technological change, for the benefit of all.

Finally, deep-diving into the core of digital technologies and looking at these technologies from different angles, helps us further deepen the way we mindfully understand, embrace, adopt; or reject, such profound changes

The purpose of this course is to provide a multidisciplinary perspective (from a technological, economic, management and social sciences) on Digital Transformation, as a fundamental trend in today's world.

Course objectives

The course will first present the main challenges and opportunities raised by the digital revolution to the society and the economy, in general. It shall first position the current technology innovation trend, from a time-perspective, using several analytical tools, drawn from a wide variety of multidisciplinary concepts. Special attention shall be given to the 'general purpose' aspects of these technologies, on the long-term technology innovation process and on the technology adoption lifecycles, as these fundamental phenomena have historical consequences (in other words, long – term impacts which are both rooted in the past, and forward-looking).

Going further down into examining how several digital technologies (e.g. Artificial Intelligence & Big Data, and Internet of Things) have the potential to transform the way we live, work and interact, the course will allow students to evaluate the game-changing dimensions of such major technological advances.

Finally, taking Digital Platforms as a model, the course will examine, from a concrete perspective, how digital is a fundamental change agent for our modern business organizations.

Digital Transformation

The "Digital Transformation" course aims at attaining, for prospective students, the following specific objectives:

- Understand the present challenges of the "Digital Revolution" in its multiple dimensions
  - Get an exposure to the way technologies can, and have already, changed, fundamentally, the socio-economic tissue of a country, region; or the world
  - Explore the 'sustainable' dimension of technology adoption
- Understand, from an individual and collective perspective, how technologies evolve, are being brought to the market, and ultimately adopted
  - From an "offer" side perspective
  - From a "demand" side perspective
- Explore the "change-driving" nature of selected current digital technologies on our personal and work environments
  - Illustrations via 'Big Data & AI' and 'IoT'
- Assess, concretely, the changing potential of digital technologies on existing business models
  - Deep-dive into "Digital Platforms"
- Be able to articulate, at the end of the course (Class (n)), a "Digital Transformation" personal vision

Pedagogy and course design

The course is divided in several classes, 3-hour each. Classes 1 to (n-1) are essentially composed of lectures, short quizzes, team works and group discussions. The last class (n) shall be devoted to group and/or individual presentations towards achieving the final grade.

The pedagogy principles behind this course are:

1. **Progressivity** – we shall start from basic principles, concepts and statements and we will evolve towards more complex and subtle issues which require the combination of the basic ideas presented throughout the course and, to some extent, the adaptation of these same fundamental concepts to different reality frames
2. **Interactivity** – each class is designed so that individual and collective participation are integral parts of the teaching environment. Attendance, punctuality, mutual respect, attention to others and team spirit are mandatory. Exploratory spirit, mind inquisitiveness, and curiosity, when aimed at the common good, are largely encouraged. Individual claims should be thoroughly self-assessed in terms of common interest before they are brought to the wider audience.
3. **Maximization of the learning experience** – individual readings, when assigned, are to be – mandatorily - performed prior to each class. The classes shall then only be devoted to deepen the understanding of such prior individual work. Groups shall be formed and expected to last

throughout the course. Self-organization, within and between groups, for assignments and team works, for the whole duration of the course is a must. Work is individual, even if presented in the name of the group. Each student is expected to produce high-quality inputs based on his/her own work.

Course materials, prerequisites, and revisions to syllabus

Minor synergies are expected between this course and the "Enterprise Essentials" and "Design Thinking" courses.

The present course mandatory reading prerequisites are the following:

- Selected chapter from: *The Second Machine Age – Work, Progress, and Prosperity in a Time of Brilliant Technologies.* **Erik Brynjolfsson, Andrew Mcafee.** WW Norton & Company, New York. 2014 (2015, Odile Jacob pour la traduction française) (hereafter « **Second Machine Age** »)

Other individual readings to be performed prior to coming to the class shall be announced in advance (see schedule).

Lectures will based on .ppt presentations which will be subsequently made available to students via the School's intranet. (***Important note:*** *These .ppt slides are only for students enrolled in the course and should not be distributed by students to any other individuals.*) Other resources and media may be used by the professor in class, included but not limited to short video clips. The syllabus and some of its materials (excluding books, reports, other printed matter, when applicable) for this course will be made available to students via the School's intranet. Print-outs and hard copy handouts, when requested, shall go through the School's facility services. Minor revisions may be made to the syllabus, due to unforeseen events. Any such revisions shall be communicated upon and students will be informed in due time. Available online resources, when the class requirements call for the use of such resources, are expected to be accessed, downloaded, and processed by the students according to their specific copyrights.

Assignments and grading

For this course, the individual grade shall be calculated as follows:

Final Grade Composition	Class attendance and participation throughout the lecture	Course quiz (MCQ)	Final presentation (group and individual)
Weight	40%	20%	40%

Orientative rubrics for grading

Class attendance and participation throughout the session

- A (between 14.5 and 20.00 points) – student attends each class and contributes frequently with high-quality contributions. Emphasis is placed on the quality of the contributions in terms of deepening the understanding and application of concepts to practical and real-world examples, however, all students are encouraged to participate as long as their interventions are aimed at the common group interest and the overall learning objectives
- B (between 13.00 and 14.49 points) – student attends each class, with moderate contributions.
- C (between 11.00 and 12.99 points) and lower (between 0 and 10.99 point) – student does not attend classes, or misses some classes and does not make any contribution or makes only limited contributions

Note on class attendance: The most important aspect of class participation is to attend each class on time, be present through its entire duration, be attentive and participate throughout the lecture. Punctuality is mandatory. Attendance will be taken for each class. If a student is sick or faces any situation precluding him/her from attending the class, he/she should provide the School admin services and the Professor with an explanation and proof/justification to this effect, as far ahead of time as possible. Each class will last three hours. Breaks shall be accommodated.

Course quiz (MCQ)

- A 20-question MCQ shall be provided midcourse. The MCQ will test the understanding of concepts, statements and ideas developed and discussed during the course. Grading is 1 point per correct answer.

Final presentation (group and individual) – a project (essay), in the form of a question to which students will answer through a carefully drafted presentation (.ppt presentation) shall be assigned to groups that have been formed at the beginning of the course. The subjects shall be communicated to the established groups during class (n-2). The groups are then expected to prepare the essay (indication: the equivalent of a 3,000 to 5,000 words' document in .ppt format, i.e. between 10 to 12 .ppt slides, including illustrations) and present it during class (n). The specific expectations for this final presentation shall be discussed during class (n-2). The orientative rubric for grading the final essay is as follows:

- A (14.5-20) – illustrates mastery of the concepts at hand; and the results are presented in a well-written, well-structured way. Positive group dynamics allowing each individual to have his/her say are demonstrated both during the preparation and the final presentation

- B (13-14.49) – illustrates an average understanding of the concepts discussed in class; however the presentation is written and presented in an understandable way. Uneven participation of the group members to the preparation and to the final presentation
- C (11 -12.99) or lower (0-10.99) – is of low quality, both in terms of contents and format. Group is obviously disengaged

Course schedule and class details

	Contents	Reading material
Session#1	Welcome to the Digital Economy!	(1) The Second Machine Age, Chapters 5 and 7 (2) "Darwin and the demon" HBR article

Class details:

- Fourth Industrial Revolution or Fifth Technology Innovation Wave? Why is it important to make a distinction:
  - Technology-driven business cycles
  - Lessons learned from past technological surges
  - Analysis of the *Digitalized* 21st Century challenges
- Technology as a macro-driver for change
  - Technology adoption fundamentals
  - Illustrations from several consumer (mass-market) examples
- **Class discussion & Assignment 1:** Technology adoption, innovation, disruption. Societal impacts

	Contents	Reading material
Session#2	Technology Trend # 1: Internet of Things (IoT)	(1) "How smart connected products are transforming competition" Porter & al, HBR

Class details:

- The Internet of Things (IoT): Fundamentals
- Assessing IoT existing and potential industry and business game-changing dimensions
  - Analysis across several industries

  - Analysis across several enterprise functions
- **Class assignment & discussion:** The distinct nature of IoT

	Contents	Reading material
Session#3	Technology Trend # 2: Big Data & Artificial Intelligence (AI)	"Landing AI Transformation Playbook", Andrew Ng "AI Decision Making" Coulson, HBR

Class details:

- Big Data & AI: An overview
- "Walking on two legs": Technology combinations and clusters
- Industry dynamics
  - From a supply side perspective
  - From a demand side perspective
- AI, Robotics, and Automation: What is really at stake?
- **Class assignment:** AI in selected industry settings

	Contents	Reading material
Session#4	Digital Platforms	"Is there a platform in your product" A. Hagiu, HBR Business Model Generation", Osterwalder Chapters TBD

Class details:

- Digital Platforms: "The gatekeepers of the digital economy"
- The several dimensions of Digital Platforms
  - The economic dimension: Multi-sided markets
  - The technology dimension: Match-making Algorithms
  - The business model dimension: The distinct nature of platforms and marketplaces as business organizations
- Digital Platforms: deep-dive
  - Digital-native companies

  - Traditional companies
- **Class assignment:** Are Digital Platforms the predominant business model in the Digital Economy?
- Preparation for Final Presentations

	Contents	Reading material
Session#5	Final presentations (group and individual)	NA