Engineering Tripos Part IIB, 4E3: Business Innovation in a Digital Age, 2020-21

Module Leader

Karla Sayegh [1]

Timing and Structure

Michaelmas term. Assessment: Coursework / 1 Individual Paper 100%

Aims

The aims of the course are to:

- Understand how digitally-enabled innovation emerges inside organizations and across ecosystems.
- Analyse and assess the effects of digitally-enabled innovation on strategizing, work and organizing and the management of expertise.

Objectives

As specific objectives, by the end of the course students should be able to:

- explain different dimensions of business innovation
- evaluate innovation processes and practices inside organizations
- analyse how digital technologies may enable or constrain organizational innovation
- explain how digital platforms have changed strategy-making and firm economics
- analyse how organizations create and/or navigate ecosystems to innovate
- analyse how digital technologies bring about new work practices
- understand the planned and unintended consequences of digital technologies in organizations
- explain the barriers of knowledge collaboration
- explain the mechanisms of knowledge collaboration needed to innovate
- assess the cultural drivers and barriers to digital innovation
- evaluate how digital technologies afford new ways of organising and change the nature of work
- think critically about the organisational and societal changes triggered by the emergence of new technologies

Content

Why do some organizations outperform others and come to dominate the marketplace? Innovation is at the core of the answer. Now more than ever, emerging digital technologies, such as web-enabled platforms and sophisticated learning algorithms that exploit massive digital trace data, are driving and scaling innovation in unprecedented ways. Digitally-enabled innovation has not only transformed products and services but has also upended business models, strategic thinking, ways of working, forms of collaborating and the ability to access ideas and expertise beyond organizational boundaries. The emerging field of digital innovation takes an integrative, cross-disciplinary perspective to support general managers (rather than functional managers in areas such as R&D, production, HR, marketing and IT and so forth) in nurturing new ideas and successfully implementing them or bringing them to market.

The aim of this course is twofold: First, students will understand how digitally-enabled innovation emerges inside organizations and across ecosystems. Second, students will analyse and assess the effects of digitally-enabled

innovations on strategizing, work and organizing and the management of expertise.

MODULE OUTLINE

Session 1: Tuesday 13 October, 16:00-18:00

- Introduction to innovation in a digital age
- Structure: interactive lecture and class discussion

Session 2: Tuesday 20 October, 16:00-18:00

- Digital innovation: Platforms and ecosystems
- Structure: interactive lecture, group work and class discussion

Session 3: Tuesday 27 October, 16:00-18:00

- Business model innovation
- Structure: interactive lecture, group work and class discussion

Session 4: Tuesday 3 November, 16:00-18:00

- Data and algorithms
- Structure: interactive lecture, group work and class discussion

Session 5: Tuesday 10 November, 16:00-18:00

- Knowledge and innovation
- Structure: interactive lecture, group work and class discussion

Session 6: Tuesday 17 November, 16:00-18:00

- Open innovation
- Structure: interactive lecture, group work and class discussion

Session 7: Tuesday 27 November, 16:00-18:00

- Digital innovation and the changing nature of work and organising
- Structure: interactive lecture, group work and class discussion

Session 8: Tuesday 1 December, 16:00-18:00

- Student presentations
- Structure: individual presentations and class discussion

Session 1: Introduction to Innovation in a Digital Age

Session 1: Introduction to innovation in a digital age

Learning points of the session:

- Introduction to the course, what to expect and how we will work

- The transformative impact of digital technologies

- Understanding what innovation means

Mandatory reading material and preparation before the session

Required reading		
Garud, R., Tuertscher, P., & Van de Ven, A. H. (2013).	Perspectives on innovation processes. *The Academy of Management Annals*, *7*(1), 775-819.	**E-article via Busine Complete** [2]
Yoo, Y. et al. (2012)	"Organizing for Innovation in the Digitized World." *Organization Science*, 23(5): pp. 1398-1408	**E-article via Inform**
Drucker, P. F. (1998)	"The Discipline of Innovation." *Harvard Business Review*, 76(6): pp. 149-157	**E-article via Busine Complete** [4]

Session 2: Digital Innovation: Platforms and Ecosystems

Session 2: Digital innovation: Platforms and ecosystems

Learning points of the session:

- Platform economics

- Platform strategies

- Innovating in ecosystems

Mandatory reading material and preparation before the session

equired reading		
Van Alstyne, M., Parker, G., and Choudhary, S. (2016)	"Pipelines, platforms, and the new rules of strategy." *Harvard Business Review.*	**E-article via Inform**
Jacobides, M. G. (2019)	"In the Ecosystem Economy, What's Your Strategy? *Harvard Business Review.* 97(5): pp. 128-137.	**E-article via Busine Complete** [5]
Yoffie, D. B., Gawer, A., & Cusumano, M. A. (2019)	"A study of more than 250 platforms a reveal why most fail." *Harvard Business Review*.	**E-article via Busine Complete** [6]

Case Study		
Gupta, S. (2020)	"Amazon in 2020." *Harvard Business Publishing.* 514025-PDF-ENG	**VLE**

Session 3: Business Model Innovation

Session 3: Business Model Innovation

Learning points of the session:

- Creating new business models

- Shifting to new business models

- Emergence of new practices and impact for the industry

Mandatory reading material and preparation before the session

Required reading		
Teece, D. J. (2010)	"Business Models, Business Strategy and Innovation." *Long Range Planning,* 43(2-3): pp. 172-194	**E-article via Scienc**
McGrath, R. and McManus, R. (2020)	"Discovery-driven Digital Transformation: Learning your way to a new business model" *Harvard Business Review.* May-June: pp.124-133.	**E-article via Busine Complete** [5]

Case Study		
Jelassi, T., Kordy, A., Ode, H., Podkolzine, R., and Vamala, S. (2018)	"Nestle: Developing a Digital Nutrition Platform For Japan." *Harvard Business Publishing*. IMD956-PDF-ENG	**VLE**

Session 4: Data and Algorithms

Session 4: Data and Algorithms

Learning points of the session:

- Big data and business intelligence for competitive advantage

- Ethical issues of algorithmic and data-driven ways of working

- AI and organizations: decision making, power and control

Mandatory reading material and preparation before the session

Required reading		
Davenport, M. (2006)	"Competing on analytics." *Harvard Business Review.*	**E-article via** Busine Complete [5]
Faraj, S., Pachidi, S., & Sayegh, K. (2018)	"Working and organizing in the age of the learning algorithm." *Information and Organization*, 28(1): pp. 62-70	**E-article via** Busine Complete [5]
Foutaine, T., McCarthy, B.,& Saleh, T. (2019)	"Building the AI-powered Organziation: Technology isn't the biggest challenge; Culture Is." *Harvard Business Review.*	**E-article via** Busine Complete [5]
Case study		
Greenstein, S. & Gulick, S.	Zebra Medical Vision. *Harvard Business Publishing.* 619014-PDF-ENG	**VLE**

Session 5: Knowledge and Innovation

Session 5: Knowledge and innovation

Learning points of the session:

- The role of knowledge in innovation

- Producing novelty across knowledge boundaries

- Cross-functional teams and complex collaboration

Mandatory reading material and preparation before the session

Required reading		
Carlile, P. (2004)	"Transferring, Translating, and Transforming: An Integrative Framework for Managing Knowledge Across Boundaries" *Organization Science*.	**E-article via JSTOR**
Edmundson, A. (2012)	"Teaming on the Fly" Harvard Business Review.	**E-article via Busine Complete** [9]
Case study		
Garvin, D. and Taahilyani, R. (2011)	"Mindtree: A community of communities." . *Harvard Business Publishing.* 311049-PDF-ENG	**VLE**

Session 6: Open Innovation

Session 6: Open innovation

Learning points of the session:

- What is open innovation

- Crowdsourcing

- Challenges to open collaboration

Mandatory reading material and preparation before the session

Background reading		
Boudreau, K. J., & Lakhani, K. R. (2013).	"Using the Crowd as an Innovation Partner." *Harvard Business Review*," 91(4), 60-69.	**E-article via Busine Complete** [9]
King, A., & Lakhani, K. R. (2013).	"Using open innovation to identify the best ideas. *MIT Sloan Management Review*," 55(1), 41	**E-article via Busine Complete** [9]
Lifshitz-Assaf, H., Tushman, M., & Lakhani, K. R. (2018)	"A study of NASA scientists shows how to overcome barriers to open innovation." *Harvard Business Review*.	**E-article via Busine Complete** [9]
Case study		
Lakhani, K. Hutter, K., Pokrywa, H.S., Füller, J.	Open Innovation at Siemens. *Harvard Business Publishing.* 613100-PDF-ENG	**VLE**

Session 7: Open innovation

Session 7: Digital Innovation and the Changing Nature of Work and Organising

Learning points of the session:

- Technology bringing about new ways of working and organizing

- Collaborating with technology

- Organizational and cultural barriers and enablers to digital innovation

Mandatory reading material and preparation before the session

Required reading		
Zammuto, R. F. et al. (2007)	"Information Technology and the Changing Fabric of Organization." *Organization Science*, 18(5): pp. 749-762	**E-article via Busine Complete** [10]
Anthony, S. D., Cobban, P., Nair, R., & Painchaud, N. (2019).	"Breaking down the barriers to Innovation." *Harvard Business Review*, *97*(6). 11 pages.	

Pisano, G. (2019)	"The Hard Truth About Innovative Cultures." *Harvard Business Review*.	
Case study		
Pachidi, S. (2017)	"Introducing data analytics in TelCo Sales Medium"	**VLE**

Session 8: Student Presentations

Session 8: Student Presentations

Learning points of the session:

- Practise presentation skills

- Receive feedback on individual paper

- Practise reviewing skills

Preparation before the session:

Prepare the slides of your presentation (10 min) and practise.

Send your slides to the lecturer and to your reviewer by Monday, November 30 at 500pm.

Read the slides of your classmate and prepare feedback (max 5 min).

During the session:

You will present the main ideas of your paper to the class.

You will receive feedback from the lecturer and a classmate.

You will provide feedback to each other on how each paper can be further developed.

Further notes

REQUIRED READING

All students are required to read a number of papers (3-4) before each session. There are three types of readings

- Academic journal articles. Articles in peer-reviewed academic journals focused on producing novel theoretical contributions to the field of organisational studies and information systems.

- Practitioner articles. Based in research, these articles focus on the implications of theory to the practice of management. They often provide actionable guidance regarding salient organisational issues or problems.

- (Teaching) Case studies are analytical narratives of real-world business problems/challenges/dilemmas facing a protagonist in an organization. They are designed to generate discussions that offer valuable learnings and concepts through collective analysis, data-driven argumentation and creative exchanges. Cases provide the context for problem framing, external/internal analysis and well-argued solutions. They provide a 'real-world' opportunity to apply concepts and frameworks in order to arrive at well-reasoned recommendations.

Coursework

COURSEWORK

The 4E3 module will be assessed by the following means:

- **Written paper, individual** (100% of total mark). This component of the assessment is made up of a final term paper.

Coursework	Format	Due date
Final term paper The individual paper assignment will include a 2,500-3,000 word paper on an agreed topic. Students will investigate and report on the effects of digital innovation in transforming a particular industry (e.g. digital goods in the entertainment sector, mobile applications in banking, etc.). Students are expected to apply the concepts discussed in the lectures. It is expected that students will, where appropriate, explicitly draw on the articles provided in the course as well as other relevant articles from their own research. The written work you submit for assessment needs to be grounded in the appropriate scholarly literature. Please, make sure that your work is carefully referenced in accordance with the Harvard system. (http://www.blogs.jbs.cam.ac.uk/infolib/2013/10/04/advice-on-plagiarism-a... [11]) More information is provided in a separate document and will be presented in the first session. Learning objective: • Deepen understandings of the concepts, frameworks and tools covered in the class. • Apply approaches and lessons learned from the class to a specific phenomenon. • Improve analytical and writing skills.	Individual Report anonymously marked	Tuesday, 8 16:00 (via [60/60]

Examination Guidelines

Please refer to Form & conduct of the examinations [12].

UK-SPEC

This syllabus contributes to the following areas of the UK-SPEC [13] standard:

Toggle display of UK-SPEC areas.

GT1

Develop transferable skills that will be of value in a wide range of situations. These are exemplified by the Qualifications and Curriculum Authority Higher Level Key Skills and include problem solving, communication, and working with others, as well as the effective use of general IT facilities and information retrieval skills. They also include planning self-learning and improving performance, as the foundation for lifelong learning/CPD.

IA1

Apply appropriate quantitative science and engineering tools to the analysis of problems.

IA2

Demonstrate creative and innovative ability in the synthesis of solutions and in formulating designs.

KU1

Demonstrate knowledge and understanding of essential facts, concepts, theories and principles of their engineering discipline, and its underpinning science and mathematics.

KU2

Have an appreciation of the wider multidisciplinary engineering context and its underlying principles.

S1

The ability to make general evaluations of commercial risks through some understanding of the basis of such risks.

P3

Understanding of contexts in which engineering knowledge can be applied (e.g. operations and management, technology, development, etc).

US4

An awareness of developing technologies related to own specialisation.

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Links
[1] mailto:k.sayegh@jbs.cam.ac.uk
[2] https://idiscover.lib.cam.ac.uk/permalink/f/1kas1sp/TN_informaworld_s10_1080_19416520_2013_791066
[3] http://dx.doi.org/10.1287/orsc.1120.0771
[4] http://idiscover.lib.cam.ac.uk/permalink/f/1kas1sp/TN_medline10187245

[5] https://idiscover.lib.cam.ac.uk/permalink/f/1kas1sp/TN_proquest1505325909
[6] http://idiscover.lib.cam.ac.uk/permalink/f/1kas1sp/TN_proquest845234820
[7] http://dx.doi.org/10.1016/j.lrp.2009.07.003
[8] http://www.jstor.org/stable/pdf/30034757.pdf
[9] http://idiscover.lib.cam.ac.uk/permalink/f/1kas1sp/TN_proquest1319248323
[10] http://idiscover.lib.cam.ac.uk/permalink/f/1kas1sp/TN_informsorsc.1070.0307
[11] http://www.blogs.jbs.cam.ac.uk/infolib/2013/10/04/advice-on-plagiarism-all-you-need-to-know-in-one-place/
[12] https://teaching.eng.cam.ac.uk/content/form-conduct-examinations
[13] https://teaching.eng.cam.ac.uk/content/uk-spec