Engineering Tripos Part IIB, 4E3: Business Innovation in a Digital Age, 2019-20

Module Leader
Stella Pachidi [1]

Lecturer
Stella Pachidi [2]

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

Aims
The aims of the course are to:

- Get acquainted with the practices and processes of innovating in the digital era.
- Get exposed to various impacts of digital innovations on individuals, organisations and industries.
- Develop a critical thinking about the role of technology in social and organisational change more generally.

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

- understand different aspects of business innovation, including product innovation, process innovation and business model innovation
- understand the distinctive character of digital technologies as integral enablers of digital innovation
- get acquainted with the organisational aspects of digital innovation
- understand digital platform thinking
- explore how organizations create ecosystems to innovate
- get to know the possible advantages and challenges of analytics and big data
- critically reflect on how data-based practices influence decision making and power relations
- understand how digital technologies allow for the emergence of new work and organisational practices
- analyse how digital innovation relates to industry transformation
- think critically about the organisational and societal changes triggered by the emergence of new technologies
- understand how IT helps organisations improve their internal operations and achieve competitive advantage
- analyse how organisational members appropriate new technologies introduced in the workplace
- critically assess how digital technologies afford new ways of organising and change the nature of work
- understand how open innovation can help organizations enhance their innovative capabilities

Content
The aim of this course is twofold: First, students will get acquainted with the practices and processes of innovating in the digital era. Second, students will be exposed to various impacts of digital innovations on individuals, organisations and industries, and will develop a critical thinking about the role of technology in social and
organisational change more generally.

The course examines how firms are adopting a plethora of images for innovation in order to effectively compete globally in a digital age. Innovation is recognised as a multi-dimensional concept which must be strategically managed in the firm. Process innovation remains important and is increasingly enabled by knowledge and service design. Furthermore, firms must be creative in developing a more holistic view of business model innovation if they hope to achieve some level of sustainable competitive advantage. In so doing, firms are adopting new strategies and are increasingly looking at different forms of collaboration and partnering across the globe. They need to develop strategies for leveraging university-industry partnerships particularly where emerging industries are developing. Firms should also develop an open approach to innovation in both opening up their innovations for collaborative exploitation by partners, as well as developing competence and capabilities in building and leveraging an ecosystem for innovation. Finally, firms are increasingly seeking to innovate in new markets in the most unlikely of places, such as at the ‘bottom of the pyramid’. These approaches to innovation require a shift in mindset, significant experimentation and the formation of new local-global collaborative partnerships for innovation.

LECTURE SYLLABUS

Session 1: Tuesday 15 October, 16:00-18:00
- Introduction to Innovation in a Digital Age
- Structure: lecture and class discussion

Session 2: Tuesday 22 October, 16:00-18:00
- Digital Innovation: Platforms and Ecosystems
- Structure: lecture and class discussion

Session 3: Tuesday 29 October, 16:00-18:00
- Data and Information in the Digital Age
- Structure: lecture and class discussion

Session 4: Tuesday 5 November, 16:00-18:00
- Business model innovation and industry transformation
- Structure: lecture and class discussion

Session 5: Tuesday 12 November, 16:00-18:00
- Knowledge and Innovation
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
- Examining the concept of innovation and how we can conceptualise it
- Understand the relevance of innovation to business in today’s dynamic world
- Understand disruptive innovation
- Discuss the shifting role of digital technology
- How digital technologies change the way companies innovate
- The range of transformations triggered by digital technology

Mandatory reading material and preparation before the session
### Background reading

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<th>Author(s)</th>
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<th>Journal/Source</th>
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### Reading after the lecture (optional)

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### Session 2: Digital Innovation: Platforms and Ecosystems

#### Session 2: Digital innovation: Platforms and ecosystems

### Learning points of the session:

- What is digital innovation?
- The architecture of digital innovation
- Generativity and digital platforms
- Innovating in ecosystems

### Mandatory reading material and preparation before the session
### Background reading

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### Session 3: Data and Information in the Digital Age

#### Learning points of the session:

- The power of data - enhancing business intelligence using IS
- Gaining competitive advantage with big data
- Ethical issues of data-based ways of working
- IT and organisational issues: decision making, power and control

Mandatory reading material and preparation before the session

**Background reading**

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**Case study**

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Session 4: Business model innovation and industry transformation

Session 4: Business model innovation

Learning points of the session:
- Reviewing key frameworks for creating new business models
- Business model innovation
- Complementarities to business model innovation
- Emergence of new practices and impact for the industry

**Mandatory reading material and preparation before the session**

**Background reading**

Teece, D. J. (2010)  
E-article via ScienceDirect

**Case study**

Thompson, M. (2015)  
NHS Jobs: Using digital platforms to transform recruitment across the English & Welsh National Health Service  
Case 315-268-1  
VLE

**Reading after the lecture (optional)**

E-article via ABI Informs

Orlikowski, W. J. and Scott, S. V. (2013)  
E-article via Informs

E-article via Business Complete

**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
- Collaboration and innovation across organisational boundaries

Mandatory reading material and preparation before the session

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<tbody>
<tr>
<td>Barrett, M., Kim, H.S.A., &amp; Prince, K.</td>
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Reading after the lecture (optional)

Session 6: Digital Innovation and the changing nature of work and organising

Learning points of the session:

- IT and new ways of working and organizing
- Collaborating with IT
- Mobility and teleworking
- Virtual work

Mandatory reading material and preparation before the session

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Reading after the lecture (optional)

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Session 7: Open innovation

Learning points of the session:

- What is open innovation
- Crowdsourcing
- Citizen science
- Challenges in open collaboration

Mandatory reading material and preparation before the session

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<th>Case study</th>
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<tbody>
<tr>
<td>Lakhani, K. Hutter, K., Pokrywa, H.S., Füller, J. Open Innovation at Siemens. 9-613-100</td>
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Reading after the lecture (optional)

### 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 (10min) and practise.

Send your slides to the lecturer and to your reviewer by Monday December 2nd at 10:00.

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 before each session. These can be found in the course.
outline. There are four types of reading material:

- **Background reading** material is necessary for the students to follow the lecture and must be read in advance.

- **Case studies** are reports from studies on real cases performed and reported by scholars. All students are expected to have read the case studies in advance, in order to participate in class discussion.

- **Optional reading material** can be read after each session and is expected to help the students in understanding the topic further, as well as in preparing their individual papers.

**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.

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<th>Coursework</th>
<th>Format</th>
<th>Due date &amp; marks</th>
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<tr>
<td><strong>Final term paper</strong></td>
<td>Individual Report</td>
<td>Tuesday 16:00 (via moodle) [60/60]</td>
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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. [40]

More information is provided in a separate document and will be presented in the first session.

**Learning objective:**

- Reach a deeper understanding of the concepts and theories discussed in the class.
- Learn how to apply the theories and lessons learned from the class on an in-depth analysis of a specific phenomenon.
- Develop further analytical and writing skills.

**Examination Guidelines**

Please refer to [Form & conduct of the examinations](http://www.blogs.jbs.cam.ac.uk/infolib/2013/10/04/advice-on-plagiarism-a...[41]).
UK-SPEC

The UK Standard for Professional Engineering Competence (UK-SPEC) [42] describes the requirements that have to be met in order to become a Chartered Engineer, and gives examples of ways of doing this.

UK-SPEC is published by the Engineering Council on behalf of the UK engineering profession. The standard has been developed, and is regularly updated, by panels representing professional engineering institutions, employers and engineering educators. Of particular relevance here is the ‘Accreditation of Higher Education Programmes’ (AHEP) document [43] which sets out the standard for degree accreditation.

The Output Standards Matrices [44] indicate where each of the Output Criteria as specified in the AHEP 3rd edition document is addressed within the Engineering and Manufacturing Engineering Triposes.


Links
1 [mailto:s.pachidi@jbs.cam.ac.uk
2 mailto:sp805@cam.ac.uk
3 https://idiscover.lib.cam.ac.uk/permalink/f/1kas1sp/TN_informaworld_s10_1080_19416520_2013_791066
4 https://idiscover.lib.cam.ac.uk/permalink/f/1kas1sp/TN_proquest1505325909
5 http://idiscover.lib.cam.ac.uk/permalink/f/1kas1sp/TN_proquest1746595896
6 http://idiscover.lib.cam.ac.uk/permalink/f/1kas1sp/TN_gale_ova224617306
7 http://idiscover.lib.cam.ac.uk/permalink/f/1kas1sp/TN_medline10187245
8 http://idiscover.lib.cam.ac.uk/permalink/f/1kas1sp/TN_proquest1612369854
9 http://idiscover.lib.cam.ac.uk/permalink/f/1kas1sp/TN_proquest845234820
10 http://dx.doi.org/10.1287/orsc.1120.0771
13 http://search.proquest.com/docview/1694712973?accountid=9851
15 http://search.proquest.com/docview/1497304558?accountid=9851
16 http://idiscover.lib.cam.ac.uk/permalink/f/i6hd66/44CAM_ALMA51543239120003606
17 http://dx.doi.org/10.1016/j.jsis.2015.02.001
18 http://search.proquest.com/docview/845235605?accountid=9851
19 http://dx.doi.org/10.1057/jit.2015.5
20 http://dx.doi.org/10.1016/j.lrp.2009.07.003
21 http://search.proquest.com/docview/963962187?accountid=9851
22 http://dx.doi.org/10.1287/orsc.2013.0877
26 http://dx.doi.org/10.1287/orsc.1110.0700
27 http://dx.doi.org/10.1287/orsc.1110.0707
28 http://search.ebscohost.com/login.aspx?direct=true&db=bth&bquery=(JN+%26quot%3bHarvard+Business+Review%26quot%3b+AND+DT+20080901)+AND+(AU+catmull)&type=1&site=ehost-live&scope=site
29 http://idiscover.lib.cam.ac.uk/permalink/f/1kas1sp/TN_informsorsc.1070.0307
30 http://dx.doi.org/10.1287/orsc.1110.0703
31 http://dx.doi.org/10.1287/orsc.1110.0639