Engineering Tripos Part IIB, 4E3: Business Innovation in a Digital Age, 2017-18

Module Leader
Stella Pachidi [1]

Lecturer
Stella Pachidi [1]

Timing and Structure
Michaelmas term. Assessment: Coursework / 1 Individual Paper 65% / 1 Individual Presentation & Review 10% / Group Case Study Analysis 25%

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 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: Wednesday 11 October, 15:00-17:00*

- Introduction to Innovation in a Digital Age
- Structure: lecture and class discussion

*Session 2: Wednesday 18 October, 15:00-17:00*

- Digital Innovation: Platforms and Ecosystems
- Structure: lecture and class discussion

*Session 3: Wednesday 25 October, 15:00-17:00*

- Data and Information in the Digital Age
- Structure: lecture, group presentation and class discussion

*Session 4: Wednesday 1 November, 15:00-17:00*

- Business model innovation and industry transformation
- Structure: lecture, group presentation and class discussion

*Session 5: Wednesday 8 November, 15:00-17:00*

- Knowledge and Innovation
· Structure: lecture, group presentation and class discussion

Session 6: Wednesday 15 November, 15:00-17:00
· Digital Innovation and the changing nature of work and organising
· Structure: lecture, group presentation and class discussion

Session 7: Wednesday 22 November, 15:00-17:00
· Digital transformations and open innovation
· Structure: guest lecture, group presentation and class discussion

Session 8: Wednesday 29 November, 15:00-17:00
· Student presentations
· Structure: Each individual presentation will be followed by a short discussion in the class.

Session 1: Introduction to Innovation in a Digital Age

Learning points of the session:

- Introduction to different types of business innovation
- Disruptive innovation
- Discuss the shifting role of digital technology
- How digital technologies change the way companies innovate
- Get to know Business Information Systems
- Get a grip of how digital technologies change social and organisational life

Mandatory reading material and preparation before the session

Background reading

Garud, R., Tuertscher, P., & Van de Perspectives on innovation processes. The Academy of
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
### 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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### Reading after the lecture (optional)


E-article via ScienceDirect


Ch. 6 "Enhancing Business Intelligence using Information Systems"

Printed book at: T5

#### LaValle, S. et al. (2011)


E-article via ABI Inform Complete


E-article via Palgrave

### Session 4: Business model innovation and industry transformation

#### Learning points of the session:

- Business model innovation
- Emergence of new practices and impact for the industry
- Understand the relationship of digital innovation and industry transformation
Mandatory reading material and preparation before the session

**Background reading**

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**Session 5: Knowledge and Innovation**

**Session 5: Knowledge and Innovation**

**Learning points of the session:**

- Knowledge and organisation
- Cross-functional teams and complex collaboration
- Collaboration and innovation across organisational boundaries
Mandatory reading material and preparation before the session

**Background reading**

Transferring, Translating, and Transforming: An Integrative Framework for Managing Knowledge Across Boundaries  
E-article via JSTOR

**Case study**

Barrett, M., Kim, H.S.A.. & Prince, K.  
M-PESA Power : Leveraging Service Innovation in Emerging Economies  
911-007-1  
VLE

**Reading after the lecture (optional)**

Brown, J. S. and Duguid, P. (2001)  
"Knowledge and Organization: A Social-Practice Perspective."  
E-article via Business Complete [22]

Ch. 3  
Printed book at: HM

"Digital Science and Knowledge Boundaries in Complex Innovation."  
*Organization Science*, 23(5): pp.1467-1484  
E-article via Informs

Lee, J. and Berente, N. (2012)  
"Digital Innovation and the Division of Innovative Labor: Digital Controls in the Automotive Industry."  
*Organization Science*, 23(5): pp. 1428-1447  
E-article via Informs

Catmull, E. (2008)  
"How Pixar Fosters Collective Creativity."  
*Harvard Business Review*, 86(9): pp. 64-72  
E-article via Business Complete [25]

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

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

Learning points of the session:

- IT in the workplace
- New ways of 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: Digital Business Transformation and Open Innovation: Guest Lecture**

**Learning points of the session:**
- Understand how digital technologies can support business processes
- How digital technologies can help gain competitive advantage
- The relationship between digital technologies and organisational change
- Transforming organisations with digital technologies: Resistance and workarounds

Mandatory reading material and preparation before the session

**Background reading**

| Author(s) | Title | Journal | Pages | Access
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**Case study**

| Author(s) | Title | Access
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<td>Lakhani, K. Hutter, K., Pokrywa, H.S., Füller, J.</td>
<td>Open Innovation at Siemens.</td>
<td>VLE</td>
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**Reading after the lecture (optional)**

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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 (5min) and practise. Send your slides with notes below each slide to the lecturer by 10:00am on Monday 27 November.

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** (60% of total mark). This component of the assessment is made up of a final term paper.
- **Presentation, individual** (10% of total mark). Presentation based on your individual paper and peer review.
- **Case study presentation and discussion, team** (25% of total mark). Presenting a case study (20%) and discussing another team’s presentation (5%) during one of the sessions 3-7.
Final term paper

The individual paper assignment will include a 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...](http://www.blogs.jbs.cam.ac.uk/infolib/2013/10/04/advice-on-plagiarism-a...)) 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.

Presentation

During the final lecture session, each student will give a short presentation of the main arguments of his/her individual paper, with feedback from the lecturer and classmates. This presentation should be approximately 5 mins long with an additional 5 mins for questions.

More information will be provided during the course.

Learning objective:

- Learn about digital transformations in various industries from your classmates’ presentations.
- Receive feedback on your paper.
- Practice presentation skills.

Group case analysis

Course participants will be assigned into groups once the overall class size has been finalised. Each student group will be assigned a case study which they will be required to read and think about prior to the class, and present their viewpoints and analysis to the class in sessions 3-7. Each member of the team must present to be eligible for grading. Only exceptions include exceptional circumstances such as illness covered by a doctor’s certificate.

Case study presentations should be 10-mins long and will be followed by a 5-minutes critique by the response group. Each presenting group should send the lecturer ([s.pachidi@jbs.cam.ac.uk](mailto:s.pachidi@jbs.cam.ac.uk)) and the response group a copy of their case presentation (with notes below each slide) the day before their in-class presentation.

Learning objective:

- Apply the theories learned to a real case.
- Develop analytical skills.
- Practice presentation skills.

Group case discussion

Each team will also be assigned a turn to act as a ‘response’ group, leading the discussion and question time following a case study presentation in sessions 3-7. This will be an assessed exercise and forms part of the class participation mark. Each member of the team should be prepared to critiquing the case presentations. Once again, the only exceptions include exceptional circumstances such as illness covered by a doctor’s certificate.

Learning objective:

- Apply the theories learned to a real case.
- Develop analytical and reviewing skills.
- Practice presentation skills.
Examination Guidelines

Please refer to Form & conduct of the examinations [39].

UK-SPEC

The UK Standard for Professional Engineering Competence (UK-SPEC) [40] 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 [41] which sets out the standard for degree accreditation.

The Output Standards Matrices [42] indicate where each of the Output Criteria as specified in the AHEP 3rd edition document is addressed within the Engineering and Manufacturing Engineering Triposes.

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Source URL (modified on 08-09-17): http://teaching.eng.cam.ac.uk/content/engineering-tripos-part-iib-4e3-business-innovation-digital-age-2017-18

Links

[1] mailto:s.pachidi@jbs.cam.ac.uk
[16] http://dx.doi.org/10.1057/jit.2015.5
[17] http://dx.doi.org/10.1016/j.lrp.2009.07.003