# Engineering Tripos Part IIB, 4E3: Business Innovation in a Digital Age, 2025-26

### Module Leader

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### Timing and Structure

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

## Aims

The aims of the course are to:

- Analyse the approaches, challenges and trade-offs involved in developing and implementing digital innovation
- Examine how digital technologies such as platforms, artificial intelligence (AI) and big data are transforming work and organizations.

## Objectives

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

- Identify the key dimensions and types of business innovation
- Evaluate how digital platforms influence strategic thinking and business models
- Assess how organizations build, manage, and/or participate in innovation ecosystems
- Examine the opportunities and implementation challenges of predictive and generative AI in work and organizations
- Analyse value and barriers to open innovation and develop mechanisms to enable it within organizations
- Evaluate knowledge collaboration processes critical for innovation
- Assess how digital technologies reshape work practices and organizational processes
- Interpret and evaluate the planned and unintended consequences of digital transformation
- Critically reflect on the broader organizational and societal implications of emerging technologies

## Content

In today's rapidly evolving landscape, emerging digital technologies—such as robotics, cloud computing, digital platforms, and advanced predictive and generative AI—are enabling innovation in profound and unprecedented ways. These technologies are not only reshaping products and services but are fundamentally disrupting traditional business models, organizational structures, modes of collaboration, and access to talent and expertise.

Yet, digitally enabled innovation presents complex challenges. Organizations may need to unlearn deeply embedded capabilities that once drove their success. They must also navigate the hype surrounding new technologies while critically assessing their broader implications for both organizations and society. In this context, innovation is no longer just about new offerings—it requires rethinking strategy, culture, organizational design, workforce development, and cross-disciplinary collaboration.

In this module, you will examine the strategic role of digital platforms and ecosystems, predictive and generative artificial intelligence (AI), open innovation and knowledge integration and how they have reshaped strategic

thinking, work and organizing. Through real-world case studies and interactive discussions, you will analyze the trade-offs and complexities involved in initiating, implementing, and scaling digital transformation initiatives. By the end of the course, you will be equipped with conceptual frameworks and analytical tools to critically engage with digital innovation and apply them to contemporary business challenges.

**MODULE OUTLINE**

**Unit 1: Introduction to innovation in a digital age**

- What innovation means
- The transformative impact of digital technologies
- Introduction to the course, what to expect and how we will work

**Unit 2: Platforms and ecosystem**

- The new logic of platforms: strategy, structure, business models
- How to launch and scale transaction platforms
- Leveraging ecosystems

**Unit 3: Platforms and ecosystems (cont'd)**

- How to grow and scale an innovation platform
- Ecosystem strategies
- The importance of context

**Unit 4: Predictive algorithms and the future of work**

- Launching and scaling an AI business
- AI and organizations: workforce, processes and structures
- Critical evaluation

**Unit 5: Generative algorithms and the future of work**

- Implementing Gen AI in organizations: why and how
- Gen AI and organizations: workforce, processes and structures
- Critical evaluation

**Unit 6: Open innovation**

- The value of open innovation and why it works
- How to design and execute an OI initiative – OI as digital transformation
- Challenges to open collaboration

**Unit 7: Knowledge collaboration for Innovation**

- The role of knowledge in innovation
- Producing novel products, services and processes across knowledge boundaries
- Cross-functional teams and complex collaboration

**Unit 8: Paper peer-review**

- Practice presentation skills
- Receive feedback on individual paper
- Practice reviewing skills

Please note that all sessions will be highly interactive and discussion-based. In every session, we will sense-make

about real business problems via case studies both collectively and in small groups. Therefore, you are expected to come to class having prepared the assigned case study for that session.

## Further notes

**REQUIRED READING**

All students are required to read a number of articles (~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 on research, these articles focus on the implications of theory for 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 offer valuable, contextualized application of concepts and analytical tools. Learning is achieved through collective in-class discussion based on analysis, data-driven argumentation and creative exchanges. Cases provide the context for problem framing, external/internal analysis and well-argued solutions. They also allow for concepts and frameworks to be applied in order to arrive at well-reasoned recommendations.

## 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**<br><br>The individual paper assignment will include a 2,500-3,000 word paper on an agreed upon topic. Students will investigate and report on how digital technology is driving innovation and change in a particular industry or domain of the student's choosing (e.g. digital goods in the entertainment sector, mobile applications in banking or heathcare etc.). Students are expected to apply the concepts discussed in class and where appropriate, explicitly draw on the articles provided in the module as well as other relevant articles from their own research. The written submission needs to be grounded in the appropriate literature on the topic. 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... [2]).<br><br>Learning objectives: | Individual<br><br>Report | TBA (via<br><br>[60/60] |

| | | |
|---|---|---|
| • Deepen understandings of the concepts, frameworks and/or tools on digital innovation.<br>• Apply approaches and lessons learned from the class to a specific phenomenon.<br>• Improve analytical and writing skills. | | |

## Examination Guidelines

Please refer to Form & conduct of the examinations [3].

## UK-SPEC

This syllabus contributes to the following areas of the UK-SPEC [4] 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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