

Korea Advanced Institute of Science and Technology
Graduate School of Innovation and Technology Management
Course Syllabus, Fall 2020

Course Information

- Course Title: 이노베이션 경영 **Innovation Management**
- Course Number: **ITM501**
- Prerequisites: None
- Class Time: Saturday, 16:00 – 19:00
- Location: Zoom
- Course Blog: To be informed in class

Instructor Information

- Name: **Soo Hong Noh, Ph.D.**
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Course Description and Learning Objectives

On June 19, 2018 CNN Money hastily reported that “General Electric (GE) – the iconic maker of light bulbs and jet engines – gets booted from Dow” in its headline news. Which means for the first time in 110 years GE that once was the most valuable US firm will not be a member of the elite Dow Jones Industrial Average (DJIA) provided by S&P Dow Jones Indices calculated from the 30-company stock performance. In 2015, DJIA added Apple in place of AT&T – another iconic telco giant. We are now witnessing that even world-class companies, with powerful and proven business models, eventually discover limits to growth.

Here are “the Four” – Amazon, Apple, Facebook, and Google – that are fast enough and smart enough to capture huge opportunities first and hold strong. For all they have in common, as NYU Stern marketing professor Scott Galloway put it, the Four Horsemen succeed in occupying distinct roles in our new tech-dominated high-growth world. Through different paths they have come to prominence, two of them, Amazon and Apple have been able to build tomorrow’s business while simultaneously sustaining excellence in today’s demands. The fallen giants failed to do so. The other two, Facebook and Google dominate categories that did not exist twenty-five years ago. After all, great companies regularly appear seemingly out of nowhere thanks to the accelerating (in the power of exponential growth) forces – technology advance by the impact of Moore’s law, market change by globalization on steroids, and damned too fast climate change (hundred-year floods that seem to be happening every ten years) affecting the Mother Nature, all interacting with each other. This is about how the Machine works now, as NYT columnist Thomas L. Friedman grasps and best describes it and the Machine introduces us to the Brave New World. And that’s what makes emerging high-growth industries so attractive.

ITM501 Fall 2020 is intended to provide students aiming for a broad range of business careers in which

innovation is critical for their organic growth with an in-depth understanding of the challenges of innovation—moving ideas from the earliest stages of basic research to effective products and services with an impact on the world.

There is no shortage of published ideas on how best to manage innovation. So, it's best to divide **ITM501 Fall 2020** into four major modules and the course materials prepared for this course intentionally cuts across as below:

- Module 0 – Before we get started: What is innovation management?
- Module I – The key aspects of innovation management
- Module II – Concepts and models for innovation management and risks
- Module III – Common processes for innovation management
- Module IV – The key metrics and challenges in implementation of innovation strategy

Each module introduces you to all of these – the core concept and the theories plus much-needed approaches and methods for practice – related to technological innovation, entrepreneurship, and strategic management (TIES) which was coined by MIT Sloan School. (L4)

The major learning objectives of **ITM501 Fall 2020**:

- To introduce to the critical elements of designing and developing innovative technology strategies and these elements include the pivotal roles played by corporate management decisions, (L41)
- Throughout the semester, in aid of the various case discussions, you will recognize the important role of technology in the real-world context of business innovation. (L42)

Expected Learning Outcomes

Specifically, this course will help you learn:

- How experimentation, learning, and prototyping are fundamental to articulate technology-business link providing a clear opportunity for establishing and maintaining competitive advantage.
- How to identify the technology's strategic implications and their corresponding components connecting the broader strategic elements related to technology ownership and intellectual property.
- How to design, test and learn to manage strategically viable technology alternatives and your ultimate choice of a path to pursuit.
- How to design, build, and manage a comprehensive technology strategy to fuel the development and improvement of products and services, processes, and systems in terms of enhancing the viability.
- How to design, build, and manage a robust and coherent technology-business link toward the business impact at a maximum.

This course will also help you equip with:

- Strategic and integrative thinking capabilities enabling you to fully understand why and how to develop a viable technology strategy.
- Skills to align and integrate customers and new technologies into product development process.
- Creative and innovative thinking capabilities enabling you to seek and pursue the opportunities beyond the resources you currently control.
- Overall tools and methodologies to tell you what to do and what not to do to achieve and maintain competitive advantage through the alignment of technology and business.
- How to design, build, and manage a comprehensive technology strategy to fuel the development and improvement of products and services, processes, and systems in terms of enhancing the viability.
- How to design, build, and manage a robust and coherent technology-business link toward the business impact at a maximum.

Lastly but not the least important, **ITM501** will pursue one clear and specific goal to help you become an innovation leader, for you to embrace “innovativeness” – to overcome mindlessness such as, "We do it this way because it has always been done this way."

Course Materials

The lectures will be based on the lecture notes (PowerPoint® files) uploaded on the KLMS in advance regularly every week. Your reading the books I list below are not required this semester.

- Schrage, Michael. *The Innovator's Hypothesis – How Cheap Experiments Are Worth More Than Good Ideas*. The MIT Press, 2016.
- Westerman, George, Bonner, Didier, and McAfee, Andrew. *Leading Digital – Turning Technology into Business Transformation*. Harvard Business Review Press, 2014.
- Ellenberg, Jordan. *How Not To Be Wrong: The Power Of Mathematical Thinking*. Penguin Books, 2014.
- Johnson, Steven. *Where Good Ideas Come From – The Natural History of Innovation*. Riverhead Books, 2010.
- Seelig, Tina. *InsightOut – Get Ideas Out Of Your Head And Into The World*. Harper One, 2015.
- Thiel, Peter. *Zero to One: Notes on Startups, or How to Build the Future*. Crown Business, 2014.
- Tidd, Joe, Bessant, John, and Pavitt, Keith. *Managing Innovation – Integrating Technological, Market and Organizational Change*. John Wiley & Sons, Ltd., 2015.
- Schilling, Melissa A. *Strategical Management of Technological Innovation (Fifth Edition)*. McGraw-Hill Education, 2017.

- Byers, Thomas H., Dorf, Richard C., and Nelson, Andrew J. *Technology Ventures – From Idea to Enterprise*. McGraw-Hill Education, 2015.
- Govindarajan, Vijay, and Trimble, Chris. *The Other Side of Innovation: Solving The Execution Challenge*. Harvard Business School Press, 2010.
- Blank, Steve, and Dorf, Bob. *Startup Owner's Manual: The Step-by-Step Guide for Building a Great Company*. K&S Ranch Inc., 2012.
- Ries, Eric. *The Lean Startup: How Today's Entrepreneurs Use Continuous Innovation to Create Radically Successful Businesses*. Crown Business, 2011.
- Govindarajan, Vijay, and Trimble, Chris. *Ten Rules for Strategic Innovators – From Idea to Execution*. Harvard Business School Press, 2005.
- Schmidt, Eric and Jonathan Rosenberg. *How Google Works*. Grand Central Publishing, 2014.
- Gertner, Jon. *The Idea Factory: Bell Labs and the Great Age of American Innovation*. Penguin Press, 2012.
- Harford, Tim. *Adapt: Why Success Always Starts with Failure*. Farrar, Strauss & Giroux, 2011.
- Lerner, Josh. *The Architecture of Innovation*. Harvard Business Review Press, 2012.
- von Hippel, Eric. *Democratizing Innovation*. The MIT Press, 2006.
- Utterback, James. *Mastering the Dynamics of Innovation*. Harvard Business Review Press, 1994.
- Johnson, Steven. *The Innovator's Cookbook – Essentials for Inventing What Is Next*. Riverhead Books, 2011.
- Kahneman, Daniel. *Thinking, Fast and Slow*. Farrar, Straus and Giroux, 2011.
- Kimbell, Lucy. *The Service Innovation Handbook – Action-oriented Creative Thinking Toolkit for Service Organizations (Templates, Cases, Capabilities)*, BIS Publishers, 2014.
- Christensen, Clayton M., Hall, Ridgway Harken, Dillon, Karen, and Duncan, David S. *Competing Against Luck – The Story of Innovation and Customer Choice*. HarperCollins Publishers, 2016.
- Sutton, Robert I., and Rao, Huggy. *Scaling Up Excellence: Getting to More Without Settling for Less*. Crown Business, 2014.
- von Hippel, Eric. *Free Innovation*. The MIT Press, 2017.
- Docherty, Michael. *Collective Disruption: How Corporations and Startups Can Co-create Transformative New Businesses*. Polarity Press, 2015.
- Christensen, Clayton M., Allworth, James and Dillon, Karen. *How Will Measure Your Life?* HarperCollins Publishers, 2012.
- Chipchase, Jan, and Steinhardt, Simon. *Hidden in Plain Sight – How to Create Extraordinary Products for Tomorrow's Customers*. Harper Business, 2013.

- Osterwalder, Alex, and Pigneur, Yves. *Value Proposition Design: How to Create Products and Services Customers Want*. Wiley, 2014.
- Weinberg, Gabriel, and Mares, Justin. *TRACTION: How Any Startup Can Achieve Explosive Customer Growth (19 Traction Channels)*. Penguin Press, 2015.
- Moore, Geoffrey A. *Crossing the Chasm: Marketing and Selling Disruptive Products to Mainstream Customers*. Harper Business, 2013.
- Christensen, Clayton M. *The Innovator's Dilemma - How Can Great Firms Fail?*. Harvard Business School Press, 1997.
- Friedman, Thomas L. *Thank You for Being Late: An Optimist's Guide to Thriving in the Age of Accelerations*. Farrar, Straus and Giroux, 2016.
- Kelly, Kevin. *The Inevitable: 12 Technological Forces That Will Shape Our Future*. Penguin Books, 2016.
- Isenberg, Daniel. *Worthless, Impossible and Stupid: How Contrarian Entrepreneurs Create and Capture Extraordinary Value*. Harvard Business Review Press, 2013.
- Allen, Kathleen R. *Launching New Ventures: An Entrepreneurial Approach, Seventh Edition*. CENGAGE Learning, 2016. (ISBN 978-1305102507)

Reading Lists

Required readings will be informed in class in advance. We will open every class by asking someone to briefly summarize one of the reading. You should be able to briefly outline the problem that the article addresses, describe the core points of the readings, and offer your analysis of the strengths and weaknesses of the reading's central argument.

Grading Policy

- **(20%)** Midterm Exam
- **(25%)** FINAL Exam
- **(40%)** Innovation Challenge Report and Presentation to Class
 Details of report and presentation will be announced in class.
- **(15%)** Class Participation (attendance and office-hour visits) & Reflections

Administrations:

- The current version of the **ITM501 Fall 2019** syllabus, assignments, readings and most importantly the lecture notes will be available through the KAIST KLMS.

- Please feel free to make office hour appointments with your instructor as frequent and many as possible.
- Please read the following and make sure to comply with the Academic Honor Code of BTM (School of Business and Technology Management).

Academic Honor Code of BTM (School of Business and Technology Management)

Academic integrity and honesty are critical values of KAIST community. It is essential to the academic integrity of this community that students do their own work and properly acknowledge the ideas, sources, and assistance upon which that work is based. As a member of KAIST BTM community, all students including those who take BTM courses are expected to adhere to the principles of truth, integrity, and respect. Failure to comply with the Honor Code may result in disciplinary action including failure of the course.

Academic dishonesty includes but is not limited to the following:

- **Cheating:** Copying from another's examination paper, solutions, assignments, or allowing another to copy from one's own.
- **Plagiarism:** Using another person's original work without giving appropriate credit to or acknowledging the authors or sources
- **Self-plagiarism:** Submitting one piece of work in more than one course without the explicit permission of the instructors involved.
- **Misrepresentation of authorship:** Submitting work as one's own which has been prepared by or purchased from another.
- **Unpermitted collaboration or aid:** Giving or receiving unpermitted aid on exams or assignments.

Any member of the BTM community who believes that violation of academic dishonesty has occurred should bring the matter to the attention of the department chair. The department chair will assign members of Academic Review Committee (학사심의회) to conduct a thorough investigation and, if necessary, request a due process to university.

Tentative ¹ Course Schedule:

Week	Date	Topic	Reading & Assignment
1	Sep 05	Before We Get Started <ul style="list-style-type: none"> • Embedding the Mental Models onto Innovation Proficiency (A set of concepts come up repeatedly in day-to-day decision making, problem solving, and truth seeking.) 	Readings & homework assignments required for classes in the following weeks, will be posted on KLMS throughout the semester.
2	Sep 12	What is Innovation Management? Your MOI (memo of intention) presentation to class – What makes you think you or your employer can claim to manage innovation?	

Explore how organizations enable innovation; the challenges that established companies face in pursuing innovation; discuss a series of elements that successful companies implement to drive innovation: strategic planning, implementation of technology, systemic supports, organizational diversity, developing a competitive advantage, and alternative organizational structures.

- 3 Sep 19 **The Key Aspects of Innovation Management (I)**
Capabilities (Survive and Thrive, Lead and Disrupt)
Structures (Module I – Innovation Equation, The Peter Principle, OKR & Pareto and 80/20 Principle)
- 4 Sep 26 **The Key Aspects of Innovation Management (II)**
Structures (Module II – Amazon High-Velocity Decisions, Google SPRINT)

How companies view and pursue innovation; the many aspects of what represents innovation; various innovation frameworks and theories; the impact of globalization and technology – particularly those involving artificial intelligence
- 5 Oct 03 **National Foundation Day of Korea & Chuseok – Korean Thanksgiving Day (No Class)**
- 6 Oct 10 **The Key aspects of Innovation Management (III)**
Culture (Forming & Maintaining Pro-Innovation Culture – When Intentions Do Not Match Actions)
Strategy (Proctor & Gamble 5 Steps – The Strategy Choice Cascade | Strategy Rules – Microsoft, Intel, and Apple | Ambidextrous Organizations)
- 7 Oct 17 **Concepts & Models for Innovation Management**
 - Types of Innovation
 - a. Disruptive vs. sustaining innovation
 - b. Radical vs. incremental innovation
 - c. The Innovation Matrix

d. Architectural vs. modular innovation

- Business model-, technology- and marketing Innovations
 - a. Business model innovation
 - b. Technology innovation
 - c. Marketing innovation
 - d. Ten types (Typologies) of innovations

8 Oct 24 Midterm Exam

9 Oct 31 Innovator's dilemma

- S-Curve & Hype Cycle
- Anomalies Welcomed

Jobs-To-Be-Done framework

- Milkshake Dilemma
- The Job Map
- Underserved vs. Overserved
- Scarcity & Abundance

10 Nov 07 Innovation Challenge Report – initial memo contest

11 Nov 14 The technology adoption lifecycle

- Diffusion of innovations (Everett Rogers, 1931~2004 | 5 Stages & 5 Forces)
- Crossing the chasm (2014 MIT Bitcoin Experimentation | Harvard Innovation Lab Faculty Chair Prof. Lassiter III – Entrepreneurial Marketing to Cross Moore's Chasm)
- The three horizons of growth (Koh Young Technology, Inc. | CISCO)

The 70-20-10 rule (Monitor Deloitte on Managing Innovation Portfolio)

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| 12 | Nov 21 | Risk in innovation management <ul style="list-style-type: none"> • Risk of not improving (Polaroid – What had gone wrong Software is eating the world) <p>The lifecycle of an innovation (The Innovator's DNA and The Innovator's Method)</p> |
| 13 | Nov 28 | What does successful innovation management look like? <ul style="list-style-type: none"> • Uncertainty \neq Risk • Antifragility • Innovator's Hypothesis • Effectuation Discovery-driven planning |
| 14 | Dec 05 | Common processes for innovation management <ul style="list-style-type: none"> • Push vs. pull (Dean Kamen and Segway, a personal transporter) • The Phase-gate process • The Lean startup (Harvard Business School Case – Rent the Runway) <p>Figuring out the right process for you</p> |
| 15 | Dec 12 | “Presentation Day” – Innovation Challenge Report Contest |
| 16 | Dec 19 | Final Exam |

¹ This schedule is subject to change in order to accommodate the pace of class discussions and guest speakers' schedule. This syllabus serves as a game plan subject to change, it is not a contract.