AI in the Era of Digital Transformation

Course Syllabus

1. Course Information

Course Title	AI in the Era of Digital Transformation
Course No.	
Credit Hours	3
Class Schedule	Monday & Wednesday, 6:30-8:00 pm (Indonesia, Vietnam) / 7:30-9:00 pm (China, Malaysia) / 8:30-10:00 pm (Korea)
Class Location	Online course
Pre-requisites	None, but some understanding in basic business subjects preferred
Lecturer(s)	Team-teaching by professors from 4 different Asian universities – Foreign Trade University (Vietnam), Universitas Gadjah Mada (Indonesia), Universiti Kebangsaan Malaysia (Malaysia), and Woosong University (Korea)

2. Course Overview

This is an online course jointly developed by four representative universities in Asia - Foreign Trade University (Vietnam), Universitas Gadjah Mada (Indonesia), Universiti Kebangsaan Malaysia (Malaysia), and Woosong University (Korea). The four universities have gathered to design this innovative course which can create a truly unique experience for all students taking this course. The students will be able to learn from an international group of professors and also interact with a diverse pool of students with different nationalities. By taking this course, students will not only accumulate knowledge in the field of AI (artificial intelligence) and digital transformation, but also build capabilities to communicate and collaborate in a global environment.

The topic of this course is AI in the era of digital transformation. The world has been experiencing a massive change with the rapid development in digital technology. With the development of computer technology and the internet, companies nowadays are witnessing a massive exponential increase of data in most existing industries. By adapting to the digital transformation, companies can discover unmet needs of current and potential consumers, find ways to improve products and services, forecast the direction of business environment changes, and so on. Especially the field of AI (artificial intelligence) is the most promising area of expertise, gaining attention from various academic and business areas. As AI expert Andrew Ng has once explained, artificial intelligence is the new electricity. In other words, AI will soon change the way everything functions in our economy and society as the invention of electricity did, drastically changing the ways we work and live. Of course, AI is going to change the way business is done in most industries as well. While AI is still in an early stage of developing, it will soon become the language of the future.

This course is designed to introduce basic knowledge about digital transformation, with a more specific focus on AI. Students will learn how digital technologies including AI are and will be applied to various business settings, and how to adapt business strategy and operation in the era of digital transformation.

3. Learning Goals

Through this course, students will learn:

- How digital transformation is affecting various industries (ex. Fintech in finance industry)
- How digital data is used in business to formulate and solve business problems and to support managerial decision making
- How AI technology is and will be applied in business settings
- How to make digital strategy in the era of digital transformation

4. Course Materials and Readings

There is no required textbook for this course, but the professors teaching this course will announce readings students should do. The readings are also listed in the course schedule at the end of this syllabus.

5. Assessment Method

There are four components to the assessment in this course. More information about each components of the assessment will be given to you in-class.

Component	Weight *
1. Attendance	20%
2. In-Class Participation - Comments verbally made in class - Comments made in online group chat	20%
3. Pre- & Post-Class Participation - Comments made on discussion board - Homework, short quiz, etc.	20%
4. Team Project	40%
Total	100%

* Since this is a team-teaching course among four different universities and each university may have different evaluation policies, the exact weight may be modified for each university.

6. Course Outline

To deliver both fundamental knowledge and practical applications of AI and digital transformation, this course has four sub-modules, and the modules will be taught by professors from different universities. This is a tentative outline and the order of the modules may be modified.

Week	Topic	Assignment, etc.
Week 1	Introduction to AI in the era of digital transformation	
Week 2	AI in Business	Module 1 taught by WSU guest speakers
Week 3	AI in Business (continued)	
Week 4	Digital Strategy	Module 2 taught by UGM
Week 5	Digital Strategy (continued)	
Week 6	Business Analytics	

Week 7	Business Analytics (continued)	Module 3 taught by FTU
Week 8	Fintech in Islamic Finance	Module 4 taught by UKM
Week 9	Fintech in Islamic Finance (continued); Team project presentation	

7. Course Schedule

Session	Date	Module / Instructor	Discussion Topic	Reading/Assignment	In Class
1* *** This session is a 3-hr session.**	Oct. 7 (Wed)	Course Introduction	**Introduction to the course topic provided by:** • Dr. YT Lee (WSU) • Dr. Wang Fan (SYSU) • Dr. Davenport (Guest faculty, Babson College, USA)		
			Student team project explained by Dr. Shifa (UKM)		
2	Oct. 12 (Mon)	**Module 1:** AI in Business / Dr. Davenport (Guest faculty, Babson College, USA)	**Understanding the use of AI in business:** • The current state of AI in business • AI use cases	The AI advantage, Ch.2 & Ch.3	
			Deep learning: • Understand why deep learning is perhaps the most popular cognitive technology today • Understand how deep learning works in a non-mathematical way • Understand the primary business applications of deep learning	Episode 1: Series Intro-- https://www.youtube.com/watch?v=b99UVkWzYTQ Episode 2: What Is a Neural Network?--https://www.youtube.com/watch?v=P2HPcj8lRJE Episode 3: 3 Reasons to Go Deep--https://www.youtube.com/watch?v=CEv_0r5huTY	
3	Oct. 14 (Wed)	**Module 1:** AI in Business / Dr. Davenport (Guest faculty, Babson College, USA)	**Building and Investing in AI-Based Businesses:** • Know the value and dynamics of AI-based businesses • Understand some of the challenges and opportunities in AI-based ventures	Venkat Srinivasan, "Context, Language, and Reasoning in AI: Three Key Challenges," MIT Technology Review, October 4, 2016, https://www.technologyreview.com/2016/10/14/156968/context-	

Session	Date	Module / Instructor	Discussion Topic	Reading/Assignment	In Class
				language-and-reasoning-in-ai-three-key-challenges/	
4	Oct. 19 (Mon)	**Module 1:** AI in Business / Dr. Davenport (Guest faculty, Babson College, USA)	**Boring and Exciting Things to Do with AI:** • Know why AI projects can either be boring yet useful, or exciting but challenging—and not both • Be able to assess the importance and the likely success of AI projects	Thomas H. Davenport, "In Praise of Boring AI," International Institute for Analytics, August 2, 2019, https://www.iianalytics.com/blog/2019/8/2/in-praise-of-boring-ai	**Class discussion:** Tradeoffs in choosing boring vs. exciting AI applications
5	Oct. 21 (Wed)	**Module 1:** AI in Business / Dr. Zühlke (Guest faculty, Head of the Smart Factory Systems at the German Research Center for AI, Germany)	**Smart Factory:** • Understand how digital automation technologies including AI is used in production process to make factories smart		
6	Oct. 26 (Mon)	**Module 2:** Digital Strategy/ Dr. Iman (UGM)	**Understanding Digital Innovation:** • Understand the characteristics of digital innovation • Distinguish the nature of digital innovation vs. traditional/conventional innovation • Appreciate the complexity and paradoxes in digital innovation		
7	Oct. 28 (Wed)	**Module 2:** Digital Strategy/ Dr. Iman (UGM)	**Fundamental Properties of Digital Innovation:** • Recognize the fundamental properties of digital technology • Understand the characteristics of organizational innovation with digital technology • Appreciate the impact of digital innovation in organization	**Mini Exercise:** A short essay (500 words) about a recent innovation (e.g., smart watch, electric car, drone, etc.)	
8	Nov. 2 (Mon)	**Module 2:** Digital Strategy/ Dr. Iman (UGM)	**Network Externalities and Standard in Digital Innovation:** • Understand the nature of network externalities behind digital innovation • Understand the role of technological standard in digital innovation		
9	Nov. 4 (Wed)	**Module 2:** Digital Strategy/ Dr. Iman (UGM)	**Diffusion of Innovation:** • Understand the diffusion process of technological innovation		**Group Discussion:** Each group pick a case of

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			• Identify the characteristics that makes innovation spread through the society		technological innovation (e.g., Facebook, mobile payment, 5G) and discuss why some innovation take up quickly, while some others may find it difficult to gain a traction.
10	Nov. 9 (Mon)	**Module 3:** Business Analytics/ Dr. Vinh (FTU)	**Introduction to Business Analytics**	• Davenport article - "Competing on Analytics" (Harvard Business Review) • LaValle et al. article - "Analytics: The New Path to Value" (MIT Sloan Management Review)	
			Visualization & Data Issues	• Davenport and Harris article - "The Dark Side of Customer Analytics" (Harvard Business Review)	
11	Nov. 11 (Wed)	**Module 3:** Business Analytics/ Dr. Vinh (FTU)	**Data Mining:** • Introduction • Data Mining - Market Basket • Data Mining - CART	• Loveman article – "Diamonds in the Data Mine" (Harvard Business Review) • Shmueli et. al. "Data Mining for Business Analytics: Concepts, Techniques, and Applications in Microsoft Office Excel with XLMiner" (Excel add-in – free 15 day trial available at www.solver.com/xlminer-data-mining)	
12	Nov. 16 (Mon)	**Module 3:** Business Analytics/ Dr. Vinh (FTU)	**Decision Modeling : Optimization** • Use of a software to solve business problems: e.g. marketing mix, capital budgeting, portfolio optimization	Students have to build data set which is used to make decision in student's team project.	**Group work:** Students work with their team project data

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				• Shmueli et. al. "Data Mining for Business Analytics: Concepts, Techniques, and Applications in R" • Umesh& Umesha "Business Analytics Using R - A Practical Approach"	
13	Nov. 18 (Wed)	**Module 3:** Business Analytics/ Dr. Vinh (FTU)	**Decision Making under Uncertainty: Simulation:** • Use of a software to solve business problems: e.g. Inventory management, capital investment analysis, market share estimation, sensitivity analysis		**Group work:** Students work with their team project data
14	Nov. 23 (Mon)	**Module 4:** Fintech in Islamic Finance/ Dr. Shifa (UKM)	**Overview of Islamic Economy and Finance:** • How Islamic finance promotes ethical and responsible finance • How Islamic finance may lead towards Sustainable Development Goals (SDGs)		
15	Nov. 25 (Wed)	**Module 4:** Fintech in Islamic Finance/ Dr. Shifa (UKM)	**Fintech in Islamic Finance:** • Definition and concept of FinTech • Blockchain and Digital Economy • Fintech and its Application: Blockchain, Cloud Computing, Neo-banking, Insur-tech and Crowdfunding • Trends and infrastructure		
16* * This session is a 3-hr session.	Nov. 30 (Mon)	**Student Team Project Competition**			