The Lee Kong Chian School of Business
Academic Year 2024/25
Term 2

COR-MGMT2207 INNOVATIONS FOR ASIA'S SMART CITIES

Instructors:	Dr. Thomas Menkhoff (TM); Kan Siew Ning (KSN)
Titles:	(TM) Professor of Organisational Behavior and Human Resources (Education);
	(KSN) Adjunct Lecturer ofOrganisational Behavior and Human Resources
Tel:	(TM) 6828 0397
Email:	(TM) thomasm@smu.edu.sg; (KSN) siewningkan@smu.edu.sg
Office:	LKCSB #5047; LKCSB Level 5 Adjunct Suite

COURSE DESCRIPTION

The world is rapidly urbanizing. More and more cities around the world are becoming increasingly popular as economic powerhouses and magnets for migrants from the countryside, suburban areas and other parts of the world. All big cities in both First and Third World countries as well as emerging markets such as New York, London, Tokyo, Paris, Shanghai, Hong Kong, Singapore, New Dehli, Jakarta etc. have to cope with high population density and serious challenges such as air pollution or traffic congestion. How do we pack more people into big cities and yet continue to achieve a high quality of life? How do we create and manage 'good cities' which are safe, spacious, green, connected, fair and resilient? How can cities create economic wealth while still fulfilling the CSR responsibilities of sustaining a "Green Planet"? What are the best practice designs and technical smart city solutions which could be leveraged to tackle these challenges and how can they be successfully commercialised? This course will provide answers to these questions with special emphasis on the managerial and commercial aspects of smart city concepts.

The key lies in creating and effectively managing innovative and sustainable, smart cities able to leverage on new technologies such as smart grids or sensor networks to create a place where people can live, play and work well. Starting from the stakeholder requirements of citizens and planners of innovative cities, the course will introduce students to urban design concepts as well as commercialization, management challenges and implementation issues of the smart city model. There will also be a focus on how good governance and enabling technologies such as sensor networks can facilitate the creation, management and sustainability of 'good' cities.

With the help of case studies and resource persons such as industry leaders, innovative city designers, tech experts and business development experts from local and int. companies, students will be familiarized with the opportunities and challenges of the 'smart city business' which represents a key element in the value creation and extraction strategy of the Singapore Government and related businesses. Local site visits to 'smart' urban elements of city state Singapore will complement the learning experience (note: due to the Covid-19 situation, these will be virtual site visits).

LEARNING OBJECTIVES

The overall objective of this module is to equip students with core knowledge of appreciating what it takes to plan, design, build and sustain (mega) cities that are innovative and sustainable and to know the challenges of successfully 'selling' new smart city concepts amidst increasing competition in this field.

By the end of this course, students will be able to appreciate the following 4 areas:

Taxonomy of Innovative & Sustainable Cities
- Describe the core characteristics of a Smart City and respective concepts
- Explain the unique characteristics of each component and how it adds value to innovative and sustainable (smart) cities

Design of Innovative & Sustainable Cities
- Understand the planning and design principles of Innovative & Sustainable Cities
- Explain the workings of each component of Innovative & Sustainable Cities

In-depth study of selected (Mega) Cities
- Be familiar with the challenges of selected mega cities around the globe and understand how the smart city concept can add value in terms of livability

Commercialisation of the Smart City Concept
- Appreciate the challenges in successfully commercializing smart city concepts and applications
- Know some of the key players in the Singapore context which are involved in this service sector and establish network contacts

Note: Central to this course is a SMU-X group project that takes the form of an action-based and experiential assignment, where student groups work with a partner organization with the aim of achieving innovative solutions for the organization. Based on this experiential learning, students will gain acquire practical Smart City-related competencies.

PRE-REQUISITE/ CO-REQUISITE/ MUTUALLY EXCLUSIVE COURSE(S)
Please refer to the Course Catalogue on OASIS for the most updated list of pre-requisites / co-requisites for this particular course. Do note that if this course has a co-requisite, it means that the course has to be taken together with another course. Dropping one course during BOSS bidding would result in both courses being dropped at the same time.

ASSESSMENT METHODS
Cumulative assessment (CA) constitutes 100% of the final grade, consisting of:

1. **Individual Assessment: 60% of total, consisting of**
   - Class Participation   15%
   - Term Paper   20%
   - MCQ Quiz   25%

2. **Group Assessment: 40% of total, consisting of**
   - 1st Project Proposal Presentations   10%
   - Final SMU-X Project Presentation   20%
   - Final Updated SMU-X Project Presentation Slides   10%

THERE IS NO FINAL EXAMINATION IN THIS COURSE!

Individual Assessments
Class Participation – students are encouraged to ask questions and offer your opinions during class sessions. Active and well-thought-through discussions are expected from all students. The Rubrics can be found in Annex B.

Term Paper – please refer to Annex A for the scope.

Quiz – there will be 25 multiple choice questions to test your understanding of all the smart city concepts covered in class and the assigned readings. The Quiz will be held on Week 12.

Group Assessment

SMU-X Group Project – During the term, we will work with a SMU-X project partner on projects related to start-ups and recycling. More details about the learning goals and expected project outcomes will be shared at the end of November. Past SMU-X partners have been Mandai Wildlife Group (MWG), Land Transport Authority (LTA), National Museum, Orchard Road Business Association, Gardens By The Bay, etc.

You can form your own groups. Each of the project groups is required to present a robust project proposal to the management team of the SMU-X project partner (10%), followed by project work (further details will be announced during the 1st class session), the submission of a 12-min long presentation during Week 13 (20%) which summarizes the key project findings / components of the project and the submission of the final, updated SMU-X project presentation (10%) ➔ LMS. No other report is required.

Your SMU-X project works will be coordinated by Dr Kevin Cheong (KC), Adjunct Teaching Mentor (ATM) of COR-MGMT2207.

INSTRUCTIONAL METHODS AND EXPECTATIONS

The course approach is based on both analytical rigor and the practical utilisation of Smart City principles and concepts. During the course, a variety of teaching and learning techniques will be employed to enable students to think critically and imaginatively about the various implications of the topic. A high level of student participation is required both in the classroom and in the assignments. Students are required to read widely and to participate actively in projects, presentations, team discussions and in-class discussions. A key assumption is that knowledge is constructed by learners and not merely absorbed from textbooks and people with more experience.

CONSULTATIONS, ADJUNCT TEACHING MENTOR & TEACHING ASSISTANT

- Adjunct Teaching Mentor: Dr Kevin Cheong / Email: kevincheong@smu.edu.sg
- Consultations with the lecturers to be made via email.

CLASS TIMINGS

The course is taught F2F over 13 weeks with one 3-hour session per week.

RECOMMENDED TEXTS AND READINGS

Main Textbook:
Thomas Menkhoff, Kan Siew Ning, Hans-Dieter Evers and Chay Yue Wah eds. (2018) *Living in Smart Cities: Innovation and Sustainability*. Singapore: World Scientific Publishing.

Introductory Readings:
Thomas Menkhoff, Kan Siew Ning, Hans-Dieter Evers & Chay Yue Wah (2018). "What Makes a City "Smart"?", Thomas Menkhoff, Kan Siew Ning, Hans-Dieter Evers and Chay Yue Wah (eds.), *Living in Smart Cities: Innovation and Sustainability*, pp. 1-59 (available on LMS).

Lily Kong & Orlando Woods (2018). "The Ideological Alignment of Smart Urbanism in Singapore: Critical Reflections on a Political Paradox". *Urban Studies*, 55(4), 679-701.
Available at: https://ink.library.smu.edu.sg/soss_research/2423

IMD – SUTD Smart City Index: https://www.imd.org/smart-city-observatory/home/

Forrester Research on Smart Cities: https://go.forrester.com/blogs/tag/smart-cities/

Readings from various sources will be assigned on a weekly basis. Please refer to the course outline.

Introductory Smart City Videos:
Transforming cities with technology (by the Economist)
https://www.youtube.com/watch?v=hRY-ZUIJXY0&feature=youtu.be
Smart Cities (Knowledge at Wharton)
https://www.youtube.com/watch?v=TGiBfw3I2zw
Building a Smart City: Lessons from Barcelona
https://cacm.acm.org/magazines/2018/4/226370-building-a-smart-city/abstract

Useful Links:
The following links may be useful to students doing research for this module.
- http://cities.media.mit.edu/
- http://www.ibm.com/smarterplanet/us/en/smarter_cities/overview/
- http://www.eu-smartcities.eu/
- http://www.smart-cities.eu/

UNIVERSITY POLICIES

Academic Integrity
All acts of academic dishonesty (including, but not limited to, plagiarism, cheating, fabrication, facilitation of acts of academic dishonesty by others, unauthorized possession of exam questions, or tampering with the academic work of other students) are serious offences.

All work (whether oral or written) submitted for purposes of assessment must be the student's own work. Penalties for violation of the policy range from zero marks for the component assessment to expulsion, depending on the nature of the offense.

When in doubt, students should consult the instructors of the course. Details on the SMU Code of Academic Integrity may be accessed at https://smu.sharepoint.com/sites/oasis/SitePages/DOS-WKLSWC/UCSC.aspx.

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Digital Readiness for Teaching and Learning (DRTL)
As part of emergency preparedness, instructors may conduct lessons online via the Zoom platform during the term, to prepare students for online learning. During an actual emergency, students will be notified to access the Zoom platform for their online lessons. The class schedule will mirror the current face-to-face class timetable unless otherwise stated.

WEEKLY LESSON PLANS

Session	Topics	Remarks
1	**Introduction** • Course introduction: Is Singapore a 'Smart' City? • What is a Smart City? Mega City vs. Smart City • Smart city frameworks and rankings of smart cities • Course outline specifics and deliverables *Thomas Menkhoff, Kan Siew Ning, Hans-Dieter Evers & Chay Yue Wah (2018). "What Makes a City "Smart"?", Thomas Menkhoff, Kan Siew Ning, Hans-Dieter Evers and Chay Yue Wah (eds.), Living in Smart Cities: Innovation and Sustainability, pp. 1-59.* *Textbook Chapter 3: Country 2.0 — Upgrading Cities with Smart Technologies by Steven Miller.*	Thomas
2	**Introductory Talk by SMU-X Partner Organisation** • Introduction by SMU-X Partner • Overview of group projects and project approach • Do's and Don'ts of conducting empirical SC research *This introduction could be held at the Partner's premises.*	Kevin Thomas
3	**Urban Planning 101** • What is urban planning? • Why is it important? • Components of urban planning • Examples of urban planning and the tools used • The role of urban planning in smart city governance *Textbook Chapters 1-2: Singapore's Vision of a Smart Nation — Thinking Big, Starting Small and Scaling Fast by Foo See Liang and Gary Pan; Towards a Smart Nation — It's About People, Ultimately by Poon King Wang and Lim Wee Kiat; Textbook Chapter 5: What Makes A "Smart" City Liveable? By Linda Low*	Siew Ning
4	**Selected Smart City Managerial Challenges with regards to the Environment, People & Governance** • Climate change, water scarcity, rising sea levels, coastal protection • Nudging for sustainability • Concept and practice of public-private partnerships • Concept and practice of place-making approaches *Textbook Chapter 9: A Case Study of the DTSS by Khairur Rahman* *Textbook Chapter 20: Building the Singapore Sports Hub … by K. Lange et al.* **Excursion to PUB's Marina Barrage and Visit of Sustainability Gallery (TBC)**	Thomas
5	**Group project consultations** **Introduction to Sustainable Placemaking** • What is placemaking? • Sustainability issues, challenges & opportunities in placemaking • Stakeholders in placemaking *URA, (n.d.). Placemaking: Ideas and Trends, Urban Redevelopment Authority.* *https://www.ura.gov.sg/Corporate/Resources/Ideas-and-Trends?filter=Placemaking* *Allison Heller & Toby Adams (2009) Creating healthy cities through socially sustainable placemaking, Australian Planner, 46:2, 18-21, DOI: 10.1080/07293682.2009.9995305*	Kevin

Session	Topics	Remarks
	Alex Franklin & Terry Marsden (2015) (Dis)connected communities and sustainable place-making, Local Environment, 20:8, 940-956, DOI: 10.1080/13549839.2013.879852	
6	**1ˢᵗ Project Proposal Presentations** • Students' Project Presentations • SMU-X partner to provide feedback on students' project proposals (All members must be present)	Kevin Thomas
7	**Smart Economy Components** • The role of urban leadership, ecosystem governance and innovation • Building a strong culture of innovation in Singapore: Achievements and challenges ahead • Economic success through robust knowledge clusters and digital districts: Singapore's offshore marine cluster, One North, Punggol Digital District *Textbook Chapter 15: Singapore: From Knowledge City to Start-Up Hub by Thomas Menkhoff et al.* *Textbook Chapter 8: Knowledge Cluster Development through Connectivity: Examples from Southeast Asia by HansDieter Evers, Solvay Gerke and Thomas Menkhoff*	Thomas
8	RECESS WEEK *** Due date for Term Paper**	
9	**Smart Mobility – Overview & Land Transport** • Teleworking: role of ICT as enabler of smart mobility • Categories of land transportation • Policy issues related to public transport • Driverless cars • Road planning & design • Road traffic management *Textbook Chapter 17: Alleviating Urban Traffic Congestion in Smart Cities by Sock-Yong Phang – selected pages*	Siew Ning
10	**URA Assignment and Excursion (TBC)** *Thomas Menkhoff, Caroline Wong and Waltraut Ritter (2024): Singapore's Approach towards Developing Vibrant Urban Innovation Spaces.* *In: Thomas Menkhoff, Siew Ning Kan & Kevin Chuen Kong Cheong eds. (2024): Visions for the Future: Towards More Vibrant, Sustainable and Smart Cities. Singapore: World Scientific Publishing Company (Ch 1).*	Thomas
11	**Smart Prisons** • People, Process, Technology *Textbook Chapter 19: Implementation of Smart Prisons by Kan Siew Ning* **Smart Living: Intelligent Buildings** • What makes a building "smart"? • Residential buildings • Commercial office buildings • Underground buildings • How can buildings become more intelligent?	Siew Ning

Session	Topics	Remarks
	Optional Reading. Textbook Chapter 6: Technologies for Ageing-in-Place: The Singapore Context by Nadee Goonawardene et al.	
12	**Quiz** **Project Consultations** *Backen, J., (2021). The Value of Placemaking. CISTRI, 10 May 2021. https://cistri.com/insights-news/the-value-of-placemaking* *Vukmirovic, M., & Gavrilović, S. (2020). Placemaking as an approach of sustainable urban facilities management. Facilities, 38(11), 801-818. doi:https://doi.org/10.1108/F-04-2020-0055*	Kevin Thomas Siew Ning Kevin
13	**Final Project Presentations by all Groups on Project Solutions to Project Partner Organisation** *Students should note that presentations may be held at the premises of the SMU-X partner organisation.*	Kevin Thomas

ANNEX A: TERM PAPER

Each student will be assigned one smart city topic. You have to do thorough research on the topic and produce a paper of between 1,500 and 1,800 words. Font type: either Calibri or Arial. Line spacing: at least 1.0. Citations to be in APA format.

For the topic assigned to you, do research on the topic and structure your paper accordingly with logical section headings. For a sample of logical section headings, see:
https://www.slideshare.net/slideshow/the-history-of-singapore/4967136

Alternatively, if you are unsure about how to structure the paper, you can cover some of the following, but only **if applicable**:

- History of the topic (e.g. solar energy – when was it invented and who invented it)
- Market size and/or importance of this topic to smart cities
- Leading market players (companies, countries, cities)
- How does the technology work? (if applicable)
- What are the sustainability issues? (if applicable)
- Are there any substitutes? (e.g. wind & solar energy can be substitutes for each other)
- Points that are unique to your topic (e.g. how to dispose of nuclear waste responsibly)
- Any other salient & interesting points (e.g. for electric cars, how can safety be enhanced?)

If you like, you can do basic research and come up with an outline (point form) of your topic and email to KSN for comments by Session 5.

Please refer to a separate file for the allocation of Term Paper topics to students.

ANNEX B: RUBRICS

RUBRIC FOR CLASS PARTICIPATION (CP)

A grade	B grade	C grade
Actively participates at appropriate times Fully prepared at almost every session by watching pre-class videos and readings Comments are relevant & reflect good understanding and insight of teaching materials and topic being discussed	Sometimes participates but at other times is "tuned out" Fully prepared for more than two-thirds of the sessions Comments are sometimes relevant; partial understanding of topic being discussed	Seldom participates and is generally not engaged in discussions Prepared for class discussions less than half of the time Comments are seldom relevant; does not show understanding of topic being discussed

(*) Important. Please take note of the following points.
1. Saying "I agree" is not considered as class participation; state why you agree or disagree.
2. To score a good grade for CP, both the quality and quantity of comments matter.
3. If Student [A] speaks up 10 times in one class session and all of the points are of above average quality; and Student [B] speaks up one time in a class session and the point is exceptional, insightful, Student [B] will score a higher CP grade for that class session.
4. In view of #3 above, recording your own CP for each class is a semi-futile effort.

RUBRIC FOR INDIVIDUAL TERM PAPER

A grade	B grade	C grade
Extensive research work done – beyond traditional Internet sources (e.g. online books or library books) Very clear understanding of the subject matter and scope. Excellent, thorough analysis Insightful comments & recommendations Writing is clear and well-articulated using a good balance of text & graphics.	Sufficient research work done – using mainly Internet sources Clear understanding of the subject matter & scope Good analysis Above average comments & recommendations Writing is mostly clear with some graphics to support explanation of the topic	Partial research work done Subject matter is not fully understood. Scope is incomplete (*). Analysis is average Gaps in comments & recommendations Writing is sometimes unclear and/or lacks graphics to support explanation of topic

(*) NOTE: On scope completeness, take this example. If you are doing a topic on "A nation's supply of drinking water" and you left out desalination, that would make your scope incomplete.

RUBRIC FOR SMU-X GROUP PROJECT*

Note: for each criteria, the columns "B grade" and "C grade" are to be read with reference to the details in the "A grade" column.

CRITERIA	A grade	B grade	C grade
Clearly defined problem statement	There is a clearly defined problem statement that describes the significance and magnitude of the issue that you wish to resolve together with relevant information about the potentially different types of beneficiaries impacted by the problem and your proposed solution.	The problem statement is adequately defined.	The problem statement is poorly defined.
Project Work	The project work (approach) features a highly interesting real-world use case / scenario related to sustainability matters, illustrating how your project beneficiary can benefit from your proposed approach / solution in order to solve a pressing organisational (e.g. business) challenge.	The project work (approach) is moderately interesting with a satisfactory solution that can help to solve a pressing organisational (e.g. business) challenge faced by the project beneficary.	The project work (approach) is rather uninteresting and does not adequately solve a pressing organisational (e.g. business) challenge that affects the project beneficary.
Presentation Content	The presentation content leaves no doubt that the SMU-X project partner would be keen to actively further develop / implement your innovative solution because the benefits are obvious.	Presentation content is good enough to convince the project partner that it has merit.	Presentation content is inadequate and not likely to convince the project partner that it is feasible.
Value Proposition	There is a compelling value proposition with measurable gains backed by some relevant validation data from 3-5 target users / customers.	A good value proposition.	The value proposition is below average.
Implementation & Practicality	The presented concept / solution / prototype looks not only doable from a technical Point Of View (POV) in terms of its core features / functionality but is also highly practical and value added for end-user adoption.	Mostly doable from a technical POV and quite practical.	Questionable do-ability and practicality.

[* **Please refer to the Group Assessment Project Brief which also entails FAQs in LMS**]