<u>**Media Release**</u>

SMU to launch new courses on Internet of Things and VUCA

Capstone course on business design will be a graduate requirement for business school students in new academic year

Singapore, 19 May 2015 (Tuesday) – For the new academic year starting in August 2015, Singapore Management University (SMU) students can look forward to a new elective course *Internet of Things (IoT): Technology and Applications*, and a new compulsory core module *Managing in a VUCA Context*.

<u>**Internet of Things: Technology and Applications**</u>

Conducted by the School of Information Systems (SIS), this new course will expose students to a new wave of technology known as the Internet of Things (IoT). Imagine an interconnecting network of millions of "things", physical devices, able to communicate with one another, and able to share information via the internet with the web and with people. The Internet of Things extends the boundaries of the current internet into the realm of the physical world, taking us one step closer to a time when the boundaries between the physical world and the virtual world become seamless.

The knowledge now being created from large numbers of interconnected physical objects which can sense, communicate, collaborate and share information over the internet, is leading to a new wave of innovation and service creation that will lead to many new business opportunities, and also help to improve the delivery of public sector services.

This new course will equip students with a working knowledge of state-of-the-art IoT technologies, and enable them to conceive practical IoT systems to realise Smart Nation related applications, through examples of real IoT systems. Students will learn, through hands-on experience, to build small-scale IoT systems and applications based on state-of-the-art IoT technologies.

The course will make use of the IDA Labs for students to avail of the lab's enhanced facilities.

For the inaugural class, about 40 students are expected to enroll. SMU SIS will increase the number of classes as student demand increases.

Professor Steven Miller, SMU's Vice Provost (Research) and Dean (School of Information Systems) said, "Graduates with actual hands-on IoT skills are already in demand, and this demand is only going to grow and grow over the next few years. SMU SIS students will have the advantage of knowing how to use IoT technology in an SMU way, which is to say in ways that are very human user-centered, and in ways where the technology capabilities are thoughtfully integrated with the realities of business costs and benefits, and carefully aligned with business needs and processes.

"This fits in very well with our existing strengths in cybersecurity, and in analytics for business, consumer and social insights. Now our students can gain experience with IoT technology and applications, and also work through the related issues with cybersecurity, as well as with data privacy. Our students can also experiment with using IoT systems to feed into other Big Data streams of information, and use this as an input into various types of analytics, such as consumer analytics, operational analytics, and infrastructure analytics. This is both uber cool, as well as high-valued business and government relevant, and therefore a great thing for our students.

"The IoT is a new, exciting and emerging frontier which holds much promise and possibilities. This course will prepare SMU students to ride on the emerging opportunities, which include Singapore's efforts to pioneer a new technology industry in Smart Nation capabilities, and nurture creative talents in developing impactful applications based on enabling technologies including IoT."

Managing in a VUCA Context

This is a brand new course at SMU, designed by Professor Howard Thomas, former Dean of the SMU Lee Kong Chian School of Business (LKCSB). It is one of three that SMU students can take under the 'Modes of Thinking' cluster, a new feature in the Academic Year 2015-16 curriculum.

The dynamic and fast changing nature of our world today is best described by VUCA, which stands for Volatile, Uncertain, Complex and Ambiguous. Drawing references from major trends and momentous changes happening in the world today, this course prepares students to better understand the complexity of those changes and how a single phenomenon may have ripple effects on multiple issues.

The Design of Business

In the current academic year, LKCSB has pilot-tested a new Capstone course called The Design of Business. The course prepares students for a complex environment where organisations require integrative and business design skills to ensure that they continue to strive.

The Design of Business capstone course is a new and innovative effort by LKCSB that offers a platform for SMU to partner with the industry, giving undergraduates the invaluable opportunity to work with companies in seeking out opportunities for business enhancement. Students will have to develop inter-disciplinary solutions and apply what they have learnt over four years (thus 'Capstone') to real-life projects. They will apply design and business modelling techniques to develop new products,

services and business models, by using qualitative techniques and customer-centric perspectives.

Starting Academic Year 2015, this Capstone course will be a graduate requirement for <u>all LKCSB students</u>.

Professor Gerard George, Dean of SMU Lee Kong Chian School of Business, and Professor of Innovation and Entrepreneurship, said, "The VUCA course is designed to teach students about the nature and complexities of change, and how to analyse problems from multiple dimensions. It better prepares them for the fluid situations that they will encounter in the working world. In recent years, there has been greater awareness of the importance to prepare students for the VUCA environment that demands new thinking and courses of action; we are proud to be one of the first universities to roll out a structured programme to train undergraduates in a systematic manner.

"The course is also an important platform through which we develop and strengthen entrepreneurial thinking among all SMU undergraduates. I am a firm believer that an entrepreneurial mind-set will give SMU graduates a head-start as they embark on their careers, regardless of disciplines.

"The Design of Business Capstone course, which requires LKCSB students to work 'hands-on' with businesses on projects to derive impactful applications, also prepares them to be career-ready. In the pilot, our business students have worked with companies, such as A*STAR's Institute for Infocomm Research (I^2R), Fonterra and OCBC, and proposed applicable ideas and strategies to help them explore new areas of opportunities and capture new growth. This exposure will make them more valuable to their future employers, and is testament to our commitment to produce high-calibre, industry-ready graduates with strong business acumen."

<u>**Enclosure**</u>**:**
- Annex 1 - Course description for Internet of Things: Technology and Applications
- Annex 2 - Course description for Managing in a VUCA Context
- Annex 3 - Course description for The Design of Business
- Annex 4 - Examples of projects students have embarked on under the pilot of 'The Design of Business'

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About the Singapore Management University

A premier university in Asia, the Singapore Management University (SMU) is internationally recognised for its world-class research and distinguished teaching. Established in 2000, SMU's mission is to generate leading-edge research with global impact and produce broad-based, creative and entrepreneurial leaders for the knowledge-based economy. SMU education is known for its highly interactive, collaborative and project-based approach to learning, and for its technologically enabled pedagogy of seminar-style teaching in small class sizes.

Home to around 8,800 undergraduate, postgraduate, executive and professional, full- and part-time students, SMU is comprised of six schools: School of Accountancy, Lee Kong Chian School of Business, School of Economics, School of Information Systems, School of Law, and School of Social Sciences. SMU offers a wide range of bachelors', masters' and PhD degree programmes in the disciplinary areas associated with the six schools, as well as in interdisciplinary combinations of these areas.

SMU has an emphasis on generating rigorous, high-impact, and relevant multi-disciplinary research that addresses Asian issues of global relevance. SMU faculty members collaborate with leading international researchers and universities from USA, Europe, China and India, as well as with partners in the business community and public sector, through its research institutes, centres and labs. SMU's city campus is a state-of-the art facility located in the heart of downtown Singapore, fostering strategic linkages with business, government and the wider community. www.smu.edu.sg

Internet of Things: Technology and Applications

Instructor: Associate Professor (Practice) Tan Hwee Pink, School of Information Systems

Course Description
In the near future, we can envision a world in which billions of devices can sense, communicate, and collaborate over the Internet, in the same way that humans have interacted and collaborated with one another over the World Wide Web. This vision is now known as the Internet of Things. The knowledge created from these interconnected objects can potentially offer new anticipatory services to improve our quality of lives, and can be applied to various application domains - such as smart cities, homes, transport and healthcare.

In line with worldwide efforts to realize smart cities through IoT technologies, this course is intended to equip students with the state-of-the-art in IoT technologies, to enable them to conceptualize practical IoT systems to realize citizen-centric applications.

Topics include IoT Applications, IoT Protocols, Security, and Societal Impact of IoT, to name a few.

Learning Objectives
By the end of this course, students will:
- acquire knowledge in state-of-the-art IoT systems and technologies;
- know potential IoT applications that can be created, through real-world examples;
- be able to identify and translate real needs into system requirements and constraints;
- be able to identify suitable IoT technologies to realize a practical system; and
- be able to build simple proof-of-concept applications.

Course Format
Each lesson comprises a seminar-style lecture, followed by a practical hands-on session, and an end-of-class quiz. During the practical session, students will have extensive opportunities to explore and try out the various state-of-the-art technologies (both hardware and software) that are used in IoT applications. Guest lecturers from the industry and/or agencies will also be invited from time-to-time, to speak about their experiences with real-world IoT systems and provide relevant industry perspectives.

Assessment
Students will be assessed through a combination of group projects and individual contributions.

Managing in a VUCA Context

Instructors:
1. Prof Howard Thomas (Course designer and coordinator), Professor of Strategic Management, Lee Kong Chian School of Business
2. Dr Saumya Sindhwani, Lee Kong Chian School of Business

Course description
The dynamic and fast changing nature of our world today is best described by VUCA, a term coined by the US Army War College. VUCA stands for Volatile, Uncertain, Complex and Ambiguous. The Arab Spring saw a change of government in countries like Tunisia, Egypt, Libya and Yemen. Once powerful countries in Europe are now fighting bankruptcy. The growth of the developing world which was taken for granted has begun to slow down.

Even companies that were synonymous with their product categories just a few years ago are now no longer in existence. Kodak, the inventor of the digital camera had to wind up its operations. HMV, the British entertainment retailing company and Borders, once the second largest US bookstore, have shut down due to their inability to evolve their business models with the changing times.

With such momentous changes happening in the world today, this course prepares the students to better understand the complexity of those changes and how a simple phenomenon may have ripple effects on multiple issues. This course helps students to understand the tensions in a given situation and how they need to think through a problem from multiple dimensions.

Topics include Understanding the Future, Leading and Managing on the Edge, and VUCA Integration, to name a few.

Learning objectives
By the end of this course, students will be able to:
•   Describe the mega trends impacting our world and what are the ramifications of those on the world of business.
•   Explain the factors due to which the problems are becoming increasingly complex.
•   Understand the larger context of a problem, while examining the finer details of the same.
•   Learn the ability to analyse a problem from various perspectives and develop a mind-set to appreciate the complex nature of problems.
•   Define their own ways of dealing with VUCA situations.

Assessment
Students will be assessed through a combination of group projects and individual contributions.

The Design of Business

Instructor: F. Ted Tschang, Associate Professor of Strategic Management, Lee Kong Chian School of Business

Course description
The world is changing rapidly, with market, political and organizational boundaries and futures being reshaped by disruptive technological innovations and world-changing environmental and social forces. Academic environments traditionally provide the knowledge for analyzing and understanding these separate forces as a preparation for managing business. However, in today's current environment it is critical to move beyond understanding to application as organizations require integrative and business design skills to ensure that they thrive in this environment, as they shape the world for the better.

The capstone course prepares students for these complex environments by providing a platform for bridging their academic knowledge to the solution of real world problems. The course does this by developing an integrative thinking ability that draws on the knowledge accumulated in prior core courses, as well as an understanding of how to innovate and transform organizations in dynamic (real world) business contexts. The course develops in students an ability to identify problems and develop solutions, through design methods and business model frameworks. Critical reasoning and means of testing are used to validate solutions. To action this, the capstone will simulate a "real world" innovative project implementation, consisting of three aspects of a business that must be innovatively and iteratively designed and developed: the product/service idea, the business model and the firm's strategy.

In order for students to "construct" ideas, business models and strategies for the "real world", the course is designed to relate to prior courses, in particular, strategy, business, government and society (supplying the concept of the business environment), and perspectives from the technology, globalization and thinking skill clusters. It further blends cross-disciplinary perspectives from studies of organizations and strategy, forward-looking conceptions of management and change, and human decision-making behavior.

Topics include Strategy, Design and Business Models, Customer Insight, Ideation Methods and Building Business Models, to name a few.

Learning objectives
By the end of this course, students will be able to:
• Identify business problems associated with opportunities from the complex regional and global business environments, including new and untapped markets.
• Iteratively design interdisciplinary solutions to the 'business problem' on the product/service, business model and strategic levels.
• Reason critically through the problem identification/solution process by scientific thinking and other modes of analysis, while appreciating the cognitive biases involved.
• Describe the solution's implementation issues and processes with regards to the firm's existing strategy, market, and organization.

Assessment
Students will be assessed through a combination of group projects and individual contributions.

Below are examples of projects the students have embarked on under the pilot of 'The Design of Business'. The pilot course was run in Term 2 of AY2014-15, i.e. January – April 2015.

(i)   Project with Fonterra: "Under the Capstone course, eight groups of students were involved in a project with Fonterra on understanding how to leverage insights from their customers' storefronts to offer total business solutions. Under the mentorship of Fonterra's business leaders in Foodservice, students explore ways in which to engage customers in meaningful dialogue to grow their customers' business and go beyond having a transactional relationship."

(ii)   Project with OCBC: "24 students (working in five groups) were involved with OCBC on a project titled 'SME Banking in 36 months'. Under the mentorship of senior leaders from OCBC Bank's Emerging Business Unit, students worked with OCBC Bank and SME business owners to design innovative banking solutions that would potentially change the way SMEs do business with the bank in the next three years."

(iii)   Project with A*STAR: "A group of students worked with A*STAR's Institute for Infocomm Research (I^2R) to study business innovation for virtual assistants using human language technology in a tourism context. Under the mentorship of I2R's research scientists and business development managers, students collaborated with the public as lead users and industry partners to explore new areas of opportunities, such as enhanced services and modes of service delivery to existing and new customer segments."

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