MEDIA RELEASE

SMU enhances curriculum and expands offering to prepare undergraduates for the digital age

- *School of Information Systems revises curriculum to produce future-ready graduates as IT redefines jobs*
- *Business and accountancy schools offer analytics specialisation to arm accountancy, finance, marketing, operations management students with analytics skills*

Singapore, 24 October 2016 (Monday) – Demand for infocomm professionals in Singapore is outpacing supply with 30,000 new infocomm jobs expected by 2020. The Infocomm Media 2025 masterplan has identified salient trends that are significant for the next decade, these include Big Data & Analytics, Internet of Things and Cybersecurity. The masterplan also highlighted future key infocomm job areas: Software Development, Cybersecurity, Data Analytics, and Network Infrastructure.

Globally, the demand for IT talent is also rising. Research by Graduate Management Admission Council (GMAC) on employer hiring trends shows significant growth in demand for skilled analytics talents. 51 percent of all companies surveyed globally in the 2015 GMAC Corporate Recruiters Survey planned to hire business graduates in 2015 to fill data analytics roles, up from 44 percent in 2014.

In response to these industry trends and demand, SMU has strengthened its undergraduate curriculum in three schools to contribute to the 'future-proofing' of Singapore.

School of Information Systems' revised undergraduate curriculum

The School of Information Systems (SIS) has revised its undergraduate curriculum in response to changes in technologies, nature of jobs and market demands.

Starting from August 2017, undergraduates at SIS will undergo a revised curriculum which emphasizes creating innovative computing and information solutions for business and society.

Professor Pang Hwee Hwa, Dean of School of Information Systems said, "IT will be the central nervous system of not just most businesses, large and small, but also of metropolitan cities around the world and small city states such as Singapore. Emergence of new industries such as Fintech, widespread use of analytics across industries, coming of age of technologies such as Internet of Things, Artificial Intelligence and Business Intelligence leading to the building of Smart cities and Smart nations are demanding a new breed of employees who can use IT skills to create innovative solutions for business and society. The changes to the B.Sc. (Information Systems) curriculum will produce such industry ready, innovation enabled, solution architects. They will be trained to use emerging technologies for developing end to end solutions required by businesses and society".

(1)   Building core skills

The revised core curriculum in the first two years of study focuses on creating business and social value, by developing IT solutions using innovation methods and emerging technologies. New courses such as Information Systems and Innovations, and Business Process Analysis and Solutioning will prepare SIS graduates to translate consumer, enterprise, government and social requirements into innovative IT enabled solutions.

For example, on completing the Information Systems & Innovation module, a student will be able to describe and explain how information systems can be used to create business value in a wide range of industry sectors, types of organizations and geographical contexts, as well as explain different types of innovations in the context of a business and market.

In another core module, Business Process Analysis and Solutioning, students will learn to model and analyze a business process, and apply a methodological approach to translate business process change requirements into concrete IT solutions.

[Pls refer to Annex A for the list of core modules.]

(2)   Deep-diving into career skills

Starting from their third year of study, students will specialize in career tracks in the following two categories based on their aspirations. Each career track comprises several core and elective courses.

Consultant & Business Analyst Tracks:
- Financial Technology
- Business Analytics
- Digital Business Solutioning

Advanced Technical Tracks:
- Cybersecurity
- Application Development
- Cognitive Systems

The above tracks have been designed in consultation with industry representatives, to ensure that students acquire the depth and breadth in expertise to thrive in the sectors which are emerging or growing rapidly.

Building on the skills and knowledge they acquired in the first two years, students will focus on deepening their Consultant & Business Analyst and/or Advanced Technical knowledge during their final two years.

For example, the core modules taken during the first two years will ensure that all students gain knowledge and skills in the fundamentals of security. Students in Cybersecurity track will then drill deep into specific security concepts and technologies related to network, software, data, etc.

Upon graduation, students will be able to pursue diverse career paths. For example, those who took up the Financial Technology track will be able to seek employment in banks and insurance companies; while those who chose the Cybersecurity track will be able to work in the financial sector, government agencies, consulting, software development, as well as jobs related to the Smart Nation initiative.

(3) Greater flexibility and career choices for students

The new curriculum caters for a diverse spectrum of student interests. Students can now choose to acquire either deep technical skills or a healthy balance of technical and business skills depending on their career goals.

Students opting for depth can choose two tracks from within Advance Technical category or from within Consultant & Business Analyst category. Students yearning for breadth can choose one track from either Consultant & Business Analyst or Advance Technical categories, along with a second major from any of the other five schools at SMU.

With this revision, the B.Sc. (Information Systems) programme affords greater flexibility for students to prepare for their career choices. This contrasts with the current curriculum where all students are trained in application development and choose a second major. Moreover, the new curriculum aims to instil in all students the mindset of creating value for business and society, and innovation.

Strong applicants can be admitted directly into integrated BSc-Master programmes, where they will complete Master of IT in Business (Analytics), Master of IT in Business (Financial Technology), or Master of Applied Information Systems in addition to the B.Sc. (Information Systems) in four years.

Schools of Accountancy and Business to train students in Analytics as applied to their chosen fields – Accountancy, Finance, Marketing, Operations

The Infocomm Media 2025 masterplan ranks Big Data as one of the key strategic thrusts for the nation. Responding to the seminal role that analytics will play across a wide range of sectors and anticipating strong demand from employers, SMU is enhancing its undergraduate offerings to include analytics skills, as well as provide opportunities for students specialising in various disciplines to acquire analytics knowledge and insights.

From AY2017 onwards, Lee Kong Chian School of Business (LKCSB) will offer specialisations in Analytics, applied specifically to Finance, Operations Management and Marketing sectors. Together with the School of Accountancy's new Data Analytics track offered from Academic Year 2016 (starting August 2016), the University is gearing up to prepare its graduates for changes in the marketplace.

Professor Gerard George, Dean of LKCSB and Professor of Innovation and Entrepreneurship, said, "With more businesses seizing the opportunity to use descriptive and predictive analytics to improve decision-making, raise productivity and gain competitive advantage, it is not surprising that we are observing a trend of more companies looking for analytics skills in their new hires. It is therefore timely that we enhance our School's offering to give students the opportunity to specialise and acquire up-to-date analytics skills and knowledge, which will no doubt give them a competitive edge in their chosen fields. Technology is changing the face of business, and we certainly need more data-literate managers across multiple sectors."

Professor Cheng Qiang, Dean of School of Accountancy said "Our accounting tracks enable our students to enhance their professional knowledge in specific accounting fields and expand their career opportunities. We were excited to have launched our fourth accounting track in Data Analytics in August 2016. Data analytics is being used extensively in many industries to allow organisations to make better decisions; and this field will continue to grow and make significant impact in the field of accounting. Hence, it is important that we prepare our students to be future-ready."

(1)   Finance Analytics Track (offered under LKCSB Finance Major)
According to the 2011 McKinsey & Company report, Finance is one of the sectors poised to capture significant value from big data. Analytics has wide application in Finance – recent years have seen a rise in financial technology, increased popularity of algorithmic trading, and greater use of analytics in asset management and capital markets.

The new Finance Analytics Track will give students rigorous training in Finance, and hone their data analysis and modelling skills. Students will also take a newly developed module – financial innovation, which will empower them with skills related to new business models, and better prepare them for new challenges arising from future innovations. This track will prepare students for jobs in asset management, such as mutual funds and hedge funds, and banking.

(2)   Marketing Analytics Track (offered under LKCSB Marketing Major)
A thorough knowledge of Analytics as applied to Marketing will prepare students to value add in their future careers as data-driven decision-making and fact-based marketing are increasingly becoming critical for marketing functions in a wide gamut of industries. Students will get to apply their skills through collaborative projects with industry.

(3)   Operations Analytics (offered under LKCSB Operations Management Major)
Operations Analytics has vast application in various sectors – from services to manufacturing and even government, and has the potential to bring increased revenues, lower cost and improved resource utilisation for companies and nations. The Operations Analytics Track will equip students with the statistical, optimisation and simulation tools and skills-set towards gaining a competitive edge in the marketplace. In addition, the course will take students through the entire cycle of data analysis, and will give students the opportunity to employ the analytics tools using real data.

(4)   Data Analytics track by School of Accountancy
Students from the School of Accountancy have been offered the new Data Analytics track since the start of the current academic year in August 2016. The new Data Analytics track supplements the School's current three accounting tracks: Financial Management track; Risk Management & Assurance track; and Taxation track.

The School of Accountancy recognises the need to equip students with analytics skill sets due to increasing digitalisation. The new Data Analytics track provides students with the analytics knowledge that enhances decision-making and problem-solving skills in the world of accounting.

[Pls refer to Annexes B and C for description of new analytics tracks by Lee Kong Chian School of Business and School of Accountancy's Data Analytics track. Quotes by industry partners are in Annex D.]

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About 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 9,300 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

Common set of core modules in revised SIS undergraduate curriculum for Years 1-2

(1)   **Information Systems & Innovation**

(2)   **Introduction to Programming**

(3)   **Web Application Design & Development**

(4)   **Data Management**

(5)   **Business Process Analysis and Solutioning**

(6)   **Interaction Design and Prototyping**

(7)   **Software Project Management**

(8)   **Enterprise Solution Development**

(9)   **Enterprise Solution Management**

(10)   **Computational Thinking**

(11)   **Project experience**

New tracks to be offered at Lee Kong Chian School of Business from Academic Year 2017-18

Finance Analytics Track (offered under Finance major)

The finance sector has, in recent years, seen the rise of financial technology and the increased popularity of algorithmic trading. Algorithmic trading is a trading system that utilises advanced and complex mathematical models and formulas as well as fast computer programmes to make high-speed decisions and transactions, and to develop trading strategies for optimal returns in financial markets. Analytics has wide application in Finance; with enhanced utilisation in asset management and capital markets, Analytics talents are highly sought after by the industry.

From Academic Year 2017, LKCSB will offer a new Finance Analytics Track under the Finance major, to enable students to acquire and hone their data analysis and modelling skills. Students will receive rigorous training in Finance, and will develop Analytics skills specific to the Finance sector through a wide range of core and elective modules covering data management, computational thinking, portfolio management and analyses of derivative securities and fixed income investments. Students will also take a newly developed module – financial innovation, which will empower them with skills related to new business models, and better prepare them for new challenges arising from future innovations.

The Finance Analytics Track will prepare students for jobs in asset management, such as mutual funds and hedge funds, and banking.

Operations Analytics Track (offered under Operations Management Track)

Developments in digitisation has enabled companies to convert operational information and decisions into vast amounts of data. The ability to mine, present and understand this data can bring increased revenues, lower cost and improved resource utilisation for companies.

Operations Analytics has vast application in various sectors, and thus Operations Analytics practitioners are increasingly being sought after by the industry. For example, in the service industry a company may use customer and interaction data to improve retention rate, thus guaranteeing long-term revenue while reducing customer acquisition cost. A manufacturing company may use past sales and production information to better match supply and demand, thus reducing inventory cost and the occurrence of stock-outs. Government agencies may collect and analyse data generated by rail and road users to improve the efficiency of its transportation network.

From Academic Year 2017, LKCSB's Operations Management major will offer a new track in Operations Analytics which will equip students with the statistical, optimisation and simulation tools and skills-set and gain a competitive edge in the marketplace.

Students will receive rigorous training in Operations Management, with a wide range of core and electives modules covering topics such as project management, global supply chain, logistics and transport management, retail operations, and high performance warehousing and fulfilment. In addition, the course will take them through the entire cycle of data analysis, and students will have the opportunity to employ the analytics tools on real data.

Marketing Analytics Track (offered under Marketing major)

Firms nowadays have access to large amounts of data from disparate sources; combined with enhanced computing power and reduced data storage costs, data-driven decision making and fact-based marketing are becoming critical for a wide gamut of industries, bringing about a growing demand for Marketing Analytics talents across sectors.

From Academic Year 2017, LKCSB's Marketing major will offer a new track in Marketing Analytics. Students in the Marketing Analytics track will receive breadth and depth in training through core and elective modules covering consumer behaviour, marketing research, marketing analytics, data management, digital and services marketing, as well as retails and strategic brand management.

A thorough knowledge of Analytics as applied to Marketing will prepare students for internships and employment in this growing and challenging arena. They will also have the opportunity to work with industry partners through special enrichment activities and collaborative projects.

School of Accountancy's Data Analytics track launched in Academic Year 2016-2017

There are currently three courses under the Data Analytics track.

(1)   Analytics Foundation

Students will learn fundamentals of business analytics including the formulation of a business problem and developing a data driven approach to solve it. This course also equips students with basic understanding of key statistical concepts and commonly used data mining techniques in analytics. Students will also get an opportunity to get started with popular industry tools for data exploration and apply analytical techniques to uncover insights.

(2)   Accounting Analytics

With data analytics rapidly becoming an integral part of how businesses are run, it is important for accountants to possess relevant skills in data analytics. This course will focus on introducing technical aspects of data provisioning, data modelling, and data management process. It will also cover practical applications of data analytics in financial reporting & analysis, accounting for decision making, audit, and risk management.

(3)   Intelligent Accounting Function

This SMU-X course offers an experiential learning opportunity that allows students to translate classroom knowledge and theory into practical solutions for real organizations. Through this student consultancy project, students learn how to solve complex business problems with guidance from the faculty and project sponsor mentors, from problem definition to final client presentation – while simultaneously testing their skills in real world settings. The course will focus on examining accounting processes and applying data-driven analytics and insights so as to identify and create accounting delivery efficiencies.

Quotes from the industry

- **Mr Yeoh Keat Chuan, managing director, EDB Singapore:**

"In the age of big data, analytics skills are highly valued by potential employers across many industries. Many companies have shared with me that there is a global shortage of such skills. LKCSB's new tracks would help prepare our graduates to meet this demand, and take up exciting new careers in the digital era!"

- **Ms Tan Su Shan, Group Head, Consumer Banking & Wealth Management, DBS Bank:**

"The financial services industry is at the centre of the explosion of digital data today and we need professionals who can bring to the table a clear grasp of data analytics when solving the business problems of today and of the future. We welcome the fact that SMU has identified and is moving to address this need. Graduates of these new analytics tracks will be in high demand in the industry."

- **Ms Seah Gek Choo, Audit Partner and Talent Partner, Deloitte Singapore:**

"Data analytics is increasingly becoming indispensable in the accounting industry, changing the way we perform audits and advise on audit matters. For students currently pursuing an accountancy degree or equivalent, it is important for them to take modules that help them gain adequate data analytics knowledge and skills. This will enable them to have industry relevance and will put them in good stead for their future careers in the profession."

- **Mr Sanjay Panjabi, Audit Partner and Head of Audit Innovation, Deloitte Singapore:**

"In today's digital age, organisations find themselves operating in a rapidly advancing technological environment. This environment has opened up doors to unprecedented data access, and accountants are increasingly expected to possess the skill sets required to discover, interpret and communicate meaningful patterns in this data. This will in turn help their organisations and clients make effective business decisions."

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